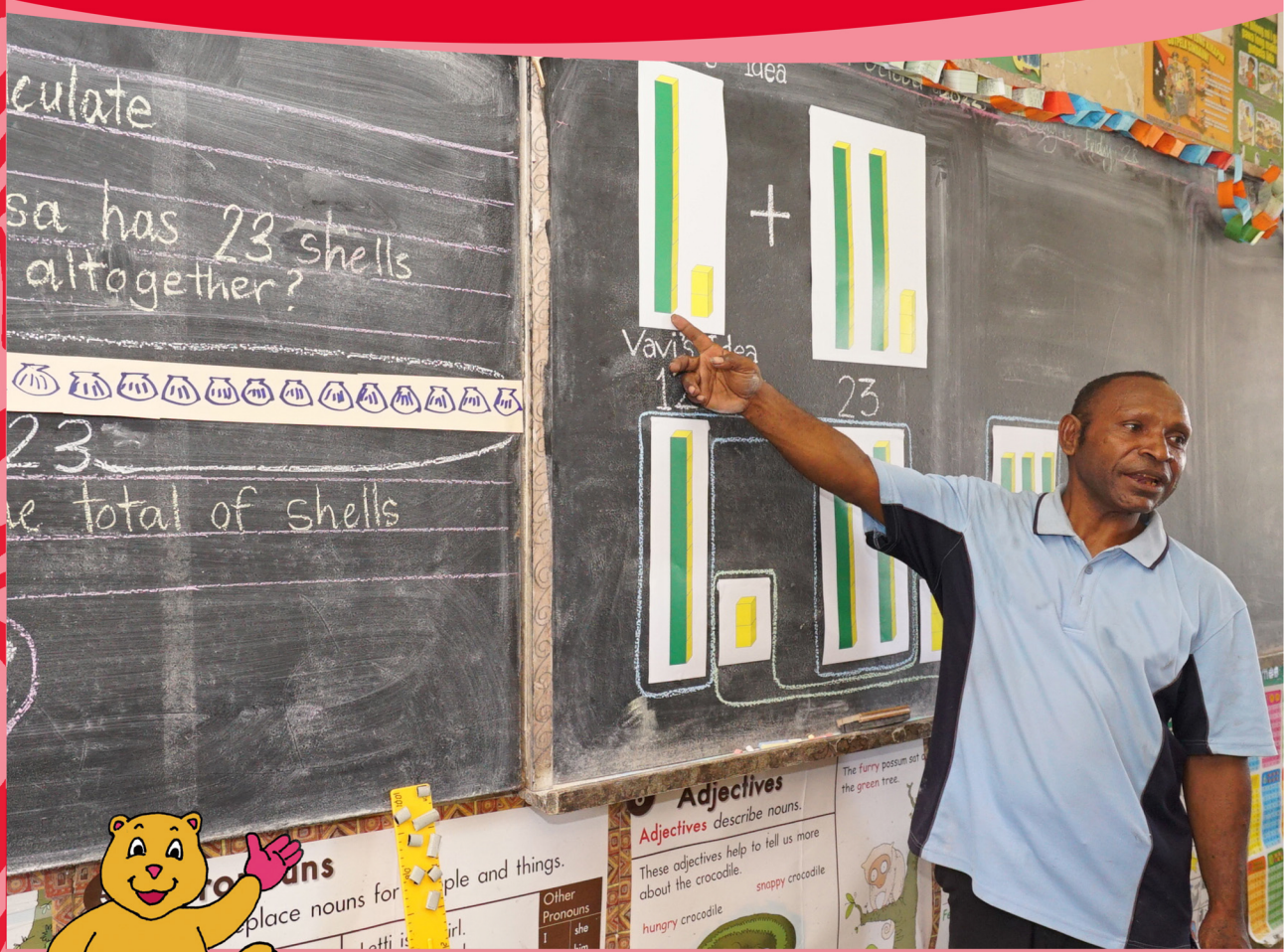
Mathematics

Teacher's Manual



Grade 2

'FREE ISSUE
NOT FOR SALE'

Papua New Guinea
Department of Education

Issued free to schools by the Department of Education

First Edition

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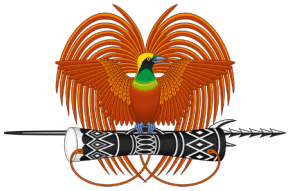
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Mathematics
Teacher's Manual

Grade 2

GPE Transforming Education



Papua New Guinea
Department of Education

Save the Children

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Secretary's Message

Dear Teacher,

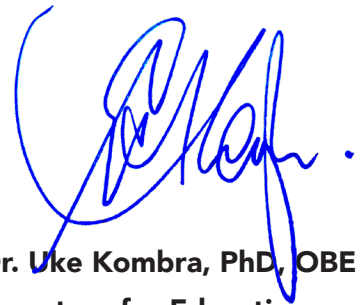
This Mathematics Teacher's Manual is developed to help and guide you to plan and teach the Mathematics lessons in line with the National Mathematics Textbook for Grade 2 students.

The manual is designed to achieve the implemented curriculum content standards outlined in the syllabus and expanded in the textbook. It provides suitable teaching and learning content and concepts for grade 2 teachers to help and guide you to plan and teach meaningful and enjoyable mathematics lessons daily.

Grade 2 teachers are introduced to many new approaches and concepts using mathematics processes to enhance students' ideas and prior knowledge, thus improving teachers' confidence in teaching mathematics well.

Therefore, you are encouraged to read and understand how to use the Teacher's Manual and Textbook with other relevant resources to deliver an interactive and enjoyable mathematics lesson that will draw students interests and love for mathematics.

I commend this Mathematics Teacher's Manual for Grade 2 to be used with the National Mathematics Textbook as an official resource for teaching in all primary schools throughout Papua New Guinea.



Dr. Uke Kombra, PhD, OBE
Secretary for Education

How to use the Teacher's Manual

Introduction

It is important to understand the composition of the National Textbook in order to use the Teacher's Manual effectively. The Teacher's Manual (TM) has been developed for teachers to teach learning contents to their students more effectively with the National Textbook (TB). The features of this Teacher's Manual and its contents correspond to the National Mathematics Textbook according to Grades Prep, 1 and 2 Mathematics Syllabus. The standards outlined in the syllabus are reflected in this Teacher's Manual to help teachers plan and conduct lessons. The Preliminary pages of the Teacher's Manual consist the following 6 sections: **Components of the Teacher's Manual, Lesson Presentation using Textbook and Teacher's Manual, How to Use the Blackboard Plan, How to Conduct Assessment, Attachments and Yearly Overview.** It is important for you to take time to read and understand how to use the Textbook and theTeacher's Manual.

1. Components of the Teacher's Manual

1. 1 Composition of the National Textbook

The composition of the National Textbook consists of the following features.

1. Chapter Heading Colours

Heading colour changes to assist teachers to recognise each teaching term.



2. Titles and Numbers

Each chapter consists of Chapter and Sub-chapter titles with numbers. All problems in the textbook have Tasks and Activities indicated by numbers. We call 1 as task 1 and 1 as activity 1.

3. Students' ideas

The textbook uses students' ideas for students to think and reason mathematically. Basically, students learn using prior ideas to read to higher order thinking.

4. Ice breaking Activity Symbol

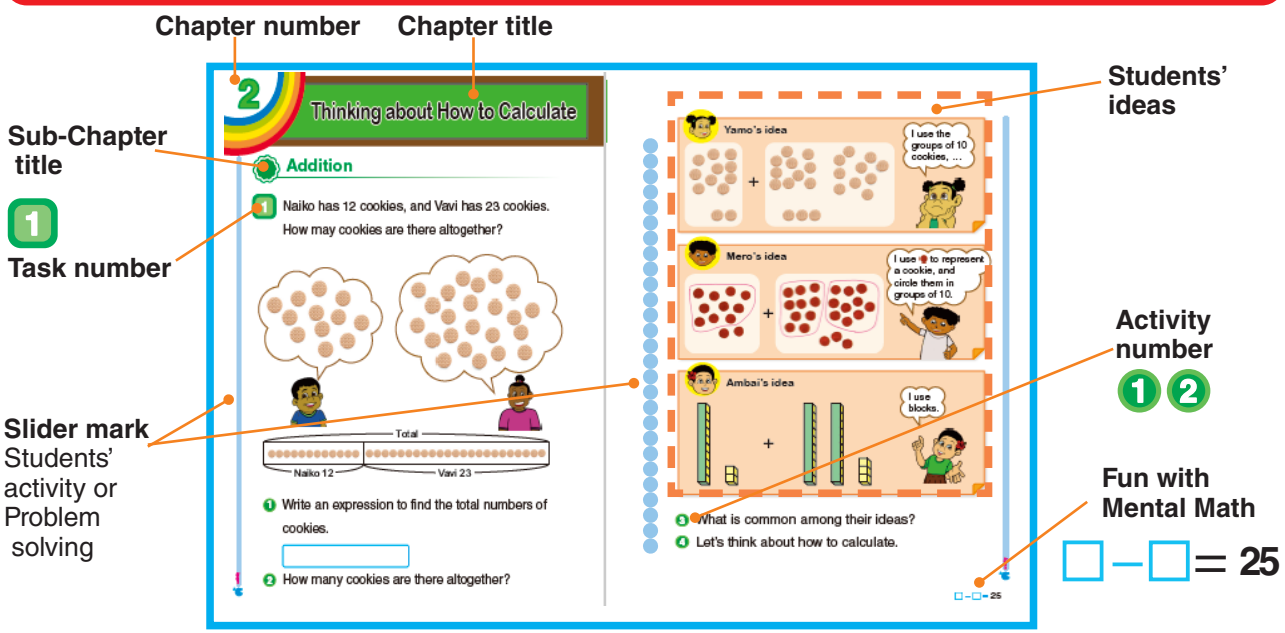
Some chapters have Ice breaking activity as the lead up activity for the chapter.

5. Fun with Mental Math!

26 = □ + □

The students can enjoy by filling in the boxes with numbers where the answer equates to the page numbers.

Sample Textbook Page



Key Competencies acquired through the use of the Textbook

Experimental mathematical activities such as **measure**, **compare**, **divide**, **order**, **touch**, **pile up** and **throw** are contained in all grades. It is intended to develop the ability and skills to be able to solve various problems logically in daily life by considering many ways.

Mathematical Literacy

Activities for improving reading, expression and comprehension abilities and skills are contained in relating formulas, letters and graphs. In addition, the textbooks are designed in order to use acquired abilities and skills for future learning contents and daily life situations.

Structure of a Chapter in the Textbook

The structure in the Chapter consists of several Sub-chapters, Tasks, Activities, Exercises and ends with a set of Exercise and Problems.

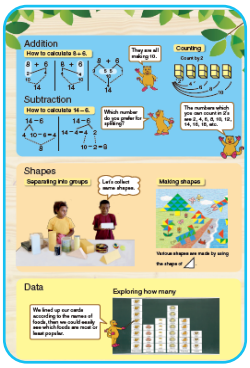


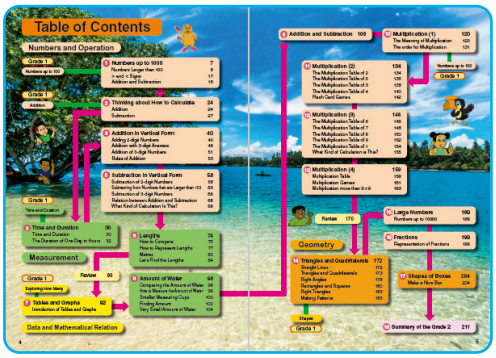
Parts of the Textbook

Textbook Introduction Page

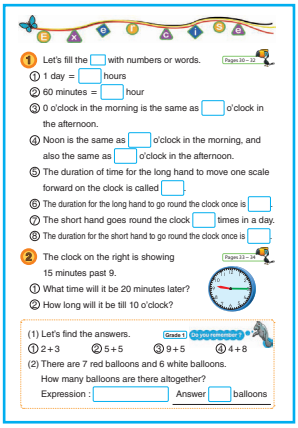
The introduction page consists of two pages which introduces very important information and icons allowing students and teachers to be familiar with what is expected to be encountered in the textbook. It also has chapters learned from the previous grade outlined carefully in a table of contents. It promotes sequences of learning to help teachers to plan and program effectively.

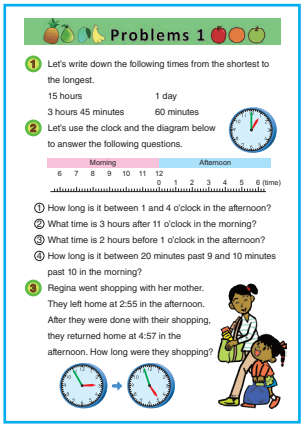






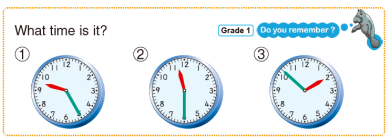
Exercise & Problems





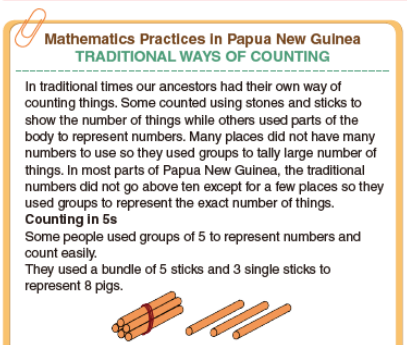
At the end of each chapter, Exercises are set for students to consolidate what has been learned in a particular chapter. Page numbers indicating specific content found for each exercise is tagged beside each exercise.
Problems and Review are placed after each Exercise in each chapter. The problems are more advanced in order to enhance students higher order thinking skills for each chapter. It also guides students to apply what they have learned.

Revision "Do you remember?"



This section of the textbook is purposely for revision. Before moving on the next chapter, these set of exercises will enable students to reflect on the contents covered in the past and relate to the new chapter. This also promotes consolidating of previous content.

Additional Information - Mathematics Extra



Additional information is placed in some units to relate the content covered to cultural and social aspects of life. It helps the students to think mathematically in solving daily life situations.

1. 2 Main content of the Teacher's Manual

The layout of the Teacher's Manual has 9 components: Lesson Information, Objectives, Prior Knowledge, Assessment, Preparation, Lesson Flow, Teacher's Notes', Sample Blackboard Plan and Reduced Textbook page of the lesson. The information given in each component will help in preparing and conducting lessons. Therefore, it is strongly recommended that the manual is read and understood before planning each lesson. Teachers should use Chapters and Sub-Chapters in the textbook and Units and Sub-units in the Teachers' Manuals.

Lesson Information

Basic information consists of unit title, sub-unit or topic and lesson number for each sub-unit. The textbook page and actual lesson number is indicated for easier reference.

Sub-unit Objective

Each Unit consists of one or more sub-units and is indicated only at the beginning of each sub-unit.
The sub-unit objectives explain specific Attitudes, Skills, Knowledge and Mathematical Thinking (ASK-MT) which should be achieved in this sub-unit.

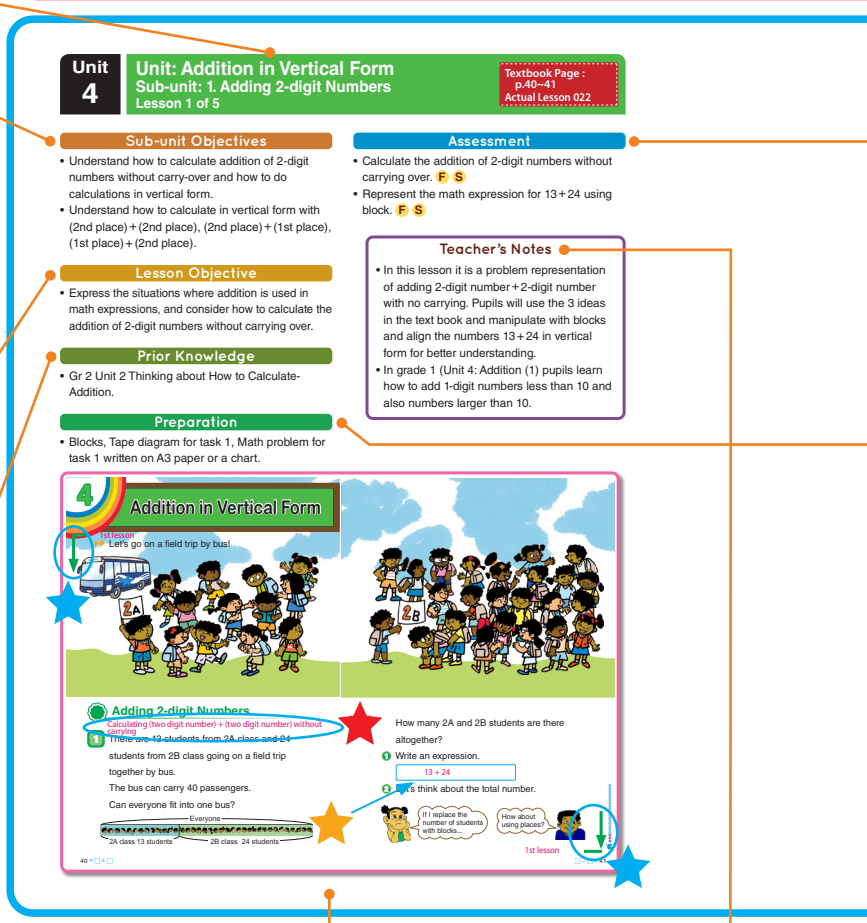
Lesson Objective

Objectives capture the ASK-MT of every lesson that should be achieved.

Prior Knowledge

Prior knowledge describes contents that students should have acquired before the new lesson. In the case where students are not ready to learn new concepts, the teacher can identify which contents to review and refer back to while teaching.

Sample Teacher's Manual Page


Unit 4
Unit: Addition in Vertical Form
Sub-unit: 1. Adding 2-digit Numbers
Lesson 1 of 5
Textbook Page : p.40–41
Actual Lesson 022
Sub-unit Objectives
• Understand how to calculate addition of 2-digit numbers without carry-over and how to do calculations in vertical form.
• Understand how to calculate in vertical form with (2nd place) + (2nd place), (2nd place) + (1st place), (1st place) + (2nd place).
Lesson Objective
• Express the situations where addition is used in math expressions, and consider how to calculate the addition of 2-digit numbers without carrying over.
Prior Knowledge
• Gr 2 Unit 2 Thinking about How to Calculate-Addition.
Preparation
• Blocks, Tape diagram for task 1, Math problem for task 1 written on A3 paper or a chart.
Assessment
• Calculate the addition of 2-digit numbers without carrying over. F S
• Represent the math expression for 13 + 24 using block. F S
Teacher's Notes
• In this lesson it is a problem representation of adding 2-digit number + 2-digit number with no carrying. Pupils will use the 3 ideas in the text book and manipulate with blocks and align the numbers 13 + 24 in vertical form for better understanding.
• In grade 1 (Unit 4: Addition (1) pupils learn how to add 1-digit numbers less than 10 and also numbers larger than 10.
Addition in Vertical Form
Adding 2-digit Numbers
Calculating (two digit number) + (two digit number) without carrying
How many 2A and 2B students are there altogether?
Write an expression.
13 + 24
Let's think about the total number.
1st lesson

Reduced Textbook page of the lesson

Corresponding textbook page is shown at the bottom of the left page.
The following are written in the page.

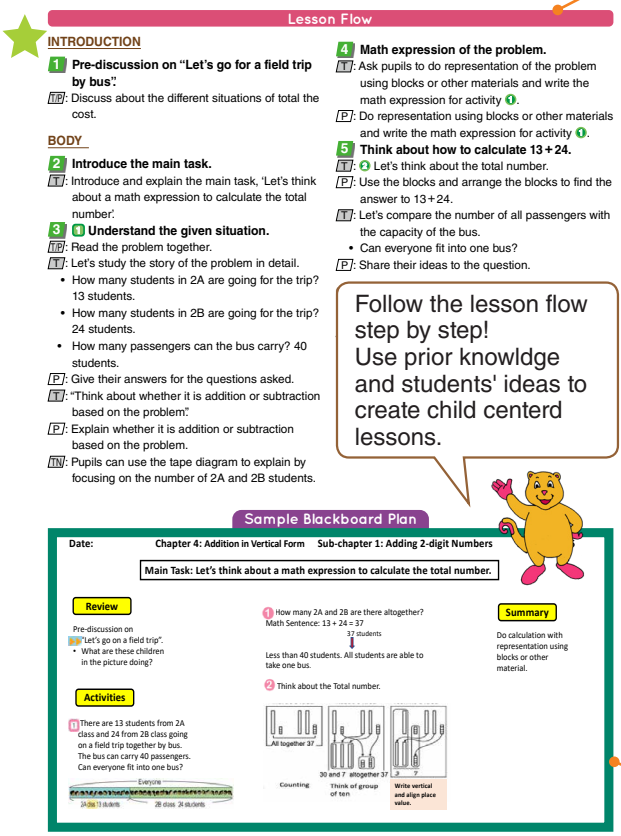
- **Lesson span**: Where the lesson begins and ends is indicated.
- Answers and solutions of the Tasks, Activities, Problems and Exercises.
- Teaching points such as; Purpose of the Tasks, Exercises and Problem types and characteristics of the problem, calculation and concepts.

Preparation

The preparation specifies the materials or resources which are recommended for use in the lesson. Some materials may not be available or accessible in the local community. In such cases, teachers are encouraged to improvise or replace them with other relevant and available materials.

Assessment

There are two types of assessments in this Teacher's Manual, 'Formative F' and 'Summative S'. The details are shown on page IX.



Lesson Flow

INTRODUCTION

1 **Pre-discussion on "Let's go for a field trip by bus".**
TP: Discuss about the different situations of total the cost.

BODY

2 **Introduce the main task.**
T: Introduce and explain the main task, 'Let's think about a math expression to calculate the total number'.

3 1 **Understand the given situation.**
TP: Read the problem together.
T: Let's study the story of the problem in detail.
- How many students in 2A are going for the trip? 13 students.
- How many students in 2B are going for the trip? 24 students.
- How many passengers can the bus carry? 40 students.

P: Give their answers for the questions asked.
T: "Think about whether it is addition or subtraction based on the problem".
P: Explain whether it is addition or subtraction based on the problem.
TN: Pupils can use the tape diagram to explain by focusing on the number of 2A and 2B students.

4 **Math expression of the problem.**
T: Ask pupils to do representation of the problem using blocks or other materials and write the math expression for activity 1.
P: Do representation using blocks or other materials and write the math expression for activity 1.

5 **Think about how to calculate 13 + 24.**
T: 2 Let's think about the total number.
P: Use the blocks and arrange the blocks to find the answer to 13 + 24.
T: Let's compare the number of all passengers with the capacity of the bus.
- Can everyone fit into one bus?

P: Share their ideas to the question.

Follow the lesson flow step by step!
Use prior knowldge and students' ideas to create child centerd lessons.

Sample Blackboard Plan

Date: Chapter 4: Addition in Vertical Form Sub-chapter 1: Adding 2-digit Numbers

Main Task: Let's think about a math expression to calculate the total number.

Review

Pre-discussion on "Let's go on a field trip".
- What are these children in the picture doing?

Activities

1 There are 13 students from 2A class and 24 from 2B class going on a field trip together by bus. The bus can carry 40 passengers. Can everyone fit into one bus?

Everyone

2A class 13 students 2B class 24 students

1 How many 2A and 2B are there altogether?
Math Sentence: 13 + 24 = 37
37 students
Less than 40 students. All students are able to take one bus.

2 Think about the Total number.

All together 37
30 and 7 altogether 37
? ? ?
Counting
Think of group of ten
Write vertical and align place value.

Summary

Do calculation with representation using blocks or other material.

Teacher's Notes

Contains supplementary information that is useful to teachers and enhances their content background knowledge as well.

Lesson flow

The lesson flow consists of several teaching points that will help in the understanding and visualisation of the lesson sequence. It is important to read this part in preparation for the lesson.

T What the teacher should do and say during the lesson.

TN Supplementary information or key ideas and points that should be considered when conducting the lesson.

S Students' expected responses and what they are expected to do during the lesson.

T/S Instruction for both teacher and students to carry out together.

1 The number in the square corresponds to the 'Task' in the textbook.

1 The number in the circle corresponds to the 'Activity' in the Textbook content of the lesson.

Important point to be emphasised during the lesson are indicated by the dotted boxes below;

Important Ideas

Important Definitions or Terms

Sample Blackboard Plan

Shows a plan of how the blackboard can be arranged and must be utilised as a guide. Refer to page VIII for more detail.

It is very important to read these information before conducting the lesson to understand the objective of the lesson.



1. 3 Other Contents: Chapter Introduction Page

The Chapter Introduction page is found at the beginning of every Unit and consists of the Unit Objectives with Teaching Overviews and Related Learning Contents.

1. Unit Objective

The Unit Objective outlines the key ASK-MT that students are expected to learn or acquire at the end of each unit. There may be one or more unit objectives for each unit depending on the unit capacity and content.

2. Teaching Overview

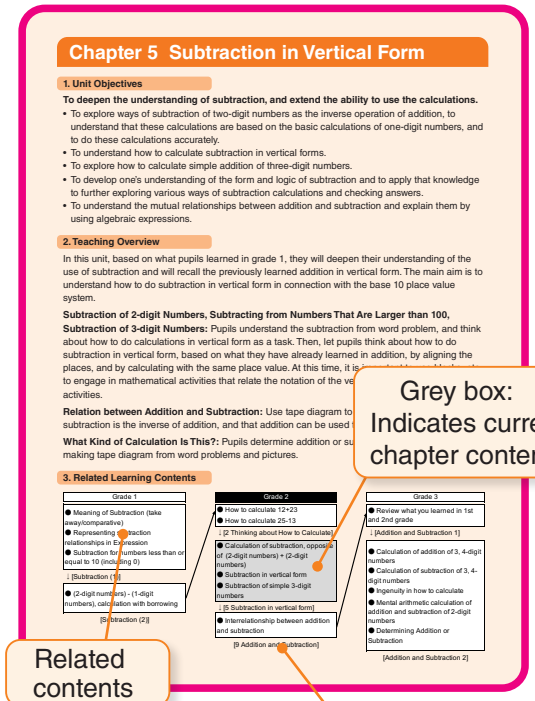
The Teaching Overview outlines the main content areas to be covered in each unit with sub-units briefly described to rationalise an overview of the unit.
This section can also assist the teachers to be aware of the type of content expected in each unit and prepare in advance.

3. Key Concepts

Key Concepts outline the main concepts that students need to acquire has essential knowledge and skills in the unit/chapter.

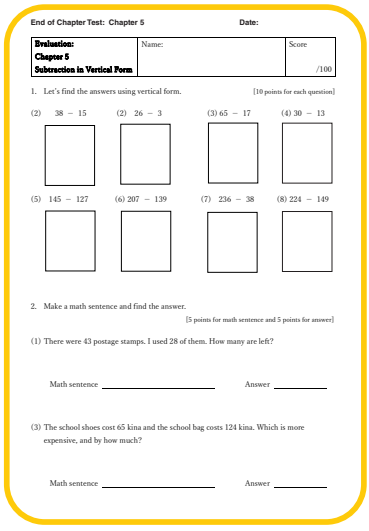
4. Related Learning Content

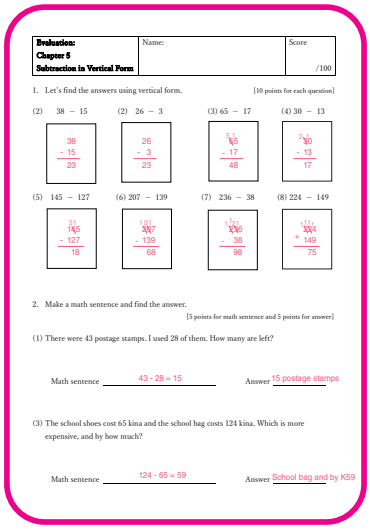
Related Learning Content outlines the content map of what the students have learned already, in-line with the current unit to be taught. The previous content covered will serve as the foundation for students to learn new concepts and contents. Furthermore, the current unit to be learned is also linked to the next learning area and grade level.



1. 4 Other Contents: End of Chapter Test

At the end of each unit in the Teacher's Manual, there is an attached End of Chapter Test. The test is purposely used to measure how much content and mathematical concepts the students have understood and acquired for each Chapter. This will also help teachers and students to understand better and observe vital areas to be improved in both teaching and learning. The test should be conducted as **a separate lesson** to confirm students progress or as assessment. Answers to the end of chapter test is located before a page of End of Chapter Test as the sample on the left.


End of Chapter Test


Answers of End of Chapter Test

Please use the evaluation test in each chapter to confirm students' progress and challenge each step for delivering the best lessons!!



2. Lesson Presentation using Textbook and Teacher's Manual

In every lesson preparation, teachers should always consider what to do before, during and after the lesson. Both the Teacher's Manual and Textbook must be used to conduct a successful lesson.

2. 1 Lesson Preparation

When preparing a mathematics lesson the following requirements should be considered;

1. Ensure to have both Textbook and Teacher's Manual and read and understand the lesson content.
2. Review previous lesson and understand the next day's lesson before delivering the current lesson.
3. Work out and be familiar with the answers to the activities and exercises in advance.
4. Study the lesson flow, relate to the blackboard plan and visualise how to use it.
5. Prepare teaching materials prior to the lesson.
6. Plan and prepare according to the recommended time.

2. 2 Lesson Presentation

When you have prepared your lesson, you should now be ready to present your lesson. Consider the following points during the lesson.

1. Have only the Teacher's Manual during the presentation of the lesson.
2. Review students' prior knowledge.
3. Present the task or problem situation from the textbook.
4. Encourage problem solving approach and facilitate group or general discussions.
5. Analyse and consider students' opinions or findings and always direct misconceptions back to the main concept. (Formative Assessment)
6. Encourage students to do homework for consolidation of skills.
   (Formative and Summative Assessment)
7. Assist students to master the skills in the lesson content through the exercises and problems.
(Formative and Summative Assessment)
8. Evaluate and summarise important points, concepts or ideas learned and predict what is expected to be learned in the next lesson.

Must Dos

- Strictly follow the Teacher's Manual with reference to the Textbook.
- Conduct experimental activities when necessary.
- Expansion of student ideas in the textbook.
- Involve students in outdoor exercises when required to.
- Encourage students to use mathematical tools or instruments appropriately for its purpose.
- Encourage more student interactions.
- Every lesson is important as concepts are linked from one lesson to the next lesson.

2. 3 Lesson Evaluation

After the lesson, teachers should reflect on the lesson taught and evaluate students' achievements and do self reflection.
These can be done through:

1. Marking of exercises or tasks done.
2. Observation checklists.
3. Review of blackboard plan.
4. Student responses during summary of the lesson.
5. Making adjustments based on the evaluation to improve teaching strategies for lessons which may require re-teaching.

3. How to Use the Blackboard Plan

The Blackboard is an important tool for teachers to use daily. This Teacher's Manual introduces the strategy for enhancing the effective use of the blackboard to improve student learning. The whole blackboard should be utilised fully from left to right corresponding to the lesson flow.

Use the blackboard according to the following steps.

1. Ensure that the whole blackboard is clean.
2. Write Date, Chapter, Topic and lesson number from the top left hand corner to the right.
3. Follow the sequence of the lesson working from left to right according to the blackboard plan including:
   a) Main Task Heading (MT)
   b) Review
   c) Student Ideas and textbook ideas
   d) Important points
   e) Tasks and activities (practices)
   f) Summary (All of the components will depend and correspond with the flow of the lesson.)

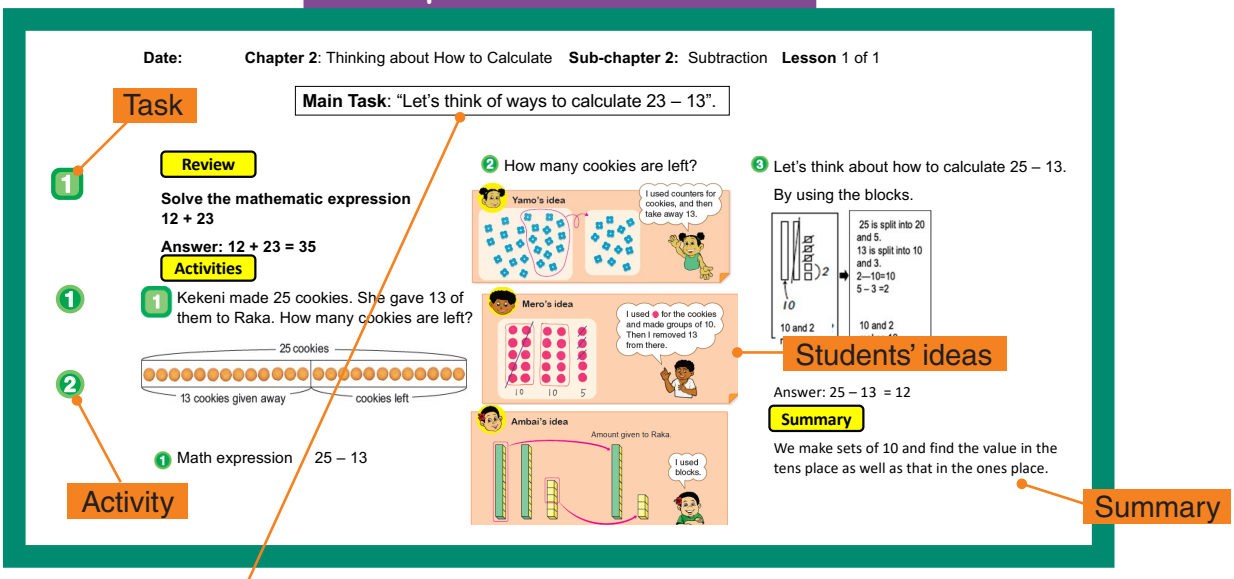
Points to consider.

1. Write in a very organised manner so the students can see connections and is visible from all parts of the room.
2. Check what you write as you write if you intend students to copy it down in their exercise books to learn.
3. Encourage students to display their ideas on the blackboard by writing and explaining what they have learned and promote student centred learning.
4. Allow students sufficient time to copy what you wrote.
   (Students should copy only the important points, not necessary to copy all.)



At the end of the lesson, it is time for summary of the lesson. Teachers should summarise using the whole blackboard to point out important points.

Sample Blackboard Plan



MT: Main task mark

The Main Task is introduced as indicated on the Blackboard plan according to the lesson flow. In this sample blackboard plan, the teacher writes and explains the Main task, then proceeds with 1 (Task 1) 1 and 2 (activities 1 and 2).

4. How to Conduct Assessment

Assessment is a fundamental aspect of students' mathematical learning and performance. Results of assessment will benefit the students in setting goals, take high responsibility for their own learning and become more independent learners.
There are two main types of assessment used in this book which are in line with the syllabus assessment to assess the students.
They are:

1. Formative Assessment (Assessment For or As)
2. Summative Assessment (Assessment Of)

This should guide teachers to prepare assessment tasks and methods.
You will find summative **S** and formative **F** assessment indicated in every lesson so it is important for you to plan how you want to assess students' learning and performance.

F Formative assessment

Formative assessment examples in the Teacher's Manual:

- Observation checklists
- Correction of exercises
- Analysis of discussions
- Students' participation.

S Summative assessment

Summative assessment examples include:

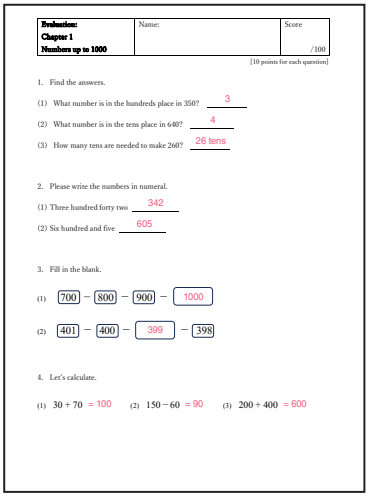
- Exercise and Problems
- End of Chapter Test
- Projects
- Homework and Assignments.

5. Attachments

The Teacher's Manual has four attached pages that the teacher can use when teaching lessons. The pages consist of a Mathematic games' information, triangle rulers and protractor, 5 mm^2 grid, 1 cm^2 grid, 1 cm^2 dotted grid and Structure of learning contents.

1. **Answers for the End of Unit Test**
2. **Content Chart from Elementary Prep to Grade 8**

Answers for the End of Unit Test



Evaluation: Chapter 1 Numbers up to 1000

Name: Score /100

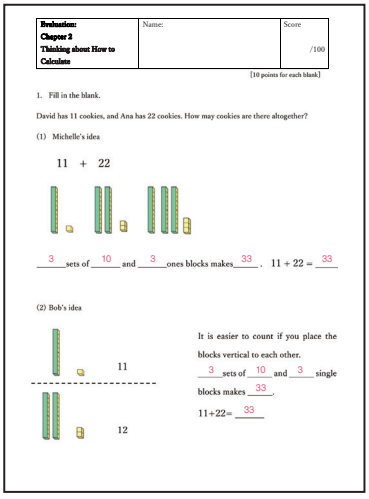
[10 points for each question]

1. Find the answers.
(1) What number is in the hundreds place in 350? 3
(2) What number is in the tens place in 640? 4
(3) How many tens are needed to make 260? 26 tens

2. Please write the numbers in numeral.
(1) Three hundred forty two 342
(2) Six hundred and five 605

3. Fill in the blank.
(1) 700 – 800 – 900 – 1000
(2) 401 – 400 – 399 – 398

4. Let's calculate.
(1) 30 + 70 = 100 (2) 150 − 60 = 90 (3) 200 + 400 = 600



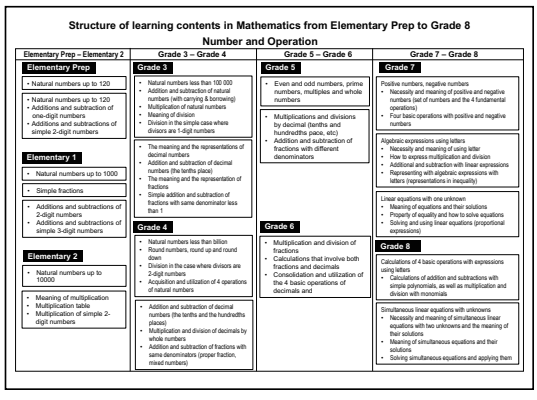
Evaluation: Chapter 2 Thinking about How to Calculate

Name: Score /100

[10 points for each blank]

1. Fill in the blank.
David has 11 cookies, and Ana has 22 cookies. How many cookies are there altogether?
(1) Michelle's idea
11 + 22
3 sets of 10 and 3 ones blocks makes 33. 11 + 22 = 33
(2) Bob's idea
11
12
It is easier to count if you place the blocks vertical to each other.
3 sets of 10 and 3 single blocks makes 33.
11+22= 33

Content Chart



Structure of learning contents in Mathematics from Elementary Prep to Grade 8

Number and Operation

Elementary Prep – Elementary 2	Grade 3 – Grade 4	Grade 5 – Grade 6	Grade 7 – Grade 8
Elementary Prep • Natural numbers up to 120 • Natural numbers up to 120 • Additions and subtractions of one-digit numbers • Additions and subtractions of simple 2-digit numbers	**Grade 3** • Natural numbers less than 100 000 • Addition and subtraction of natural numbers (with carrying & borrowing) • Multiplication of natural numbers • Meaning of division • Division in the simple case where divisors are 1-digit numbers	**Grade 5** • Even and odd numbers, prime numbers, multiples and whole numbers • Multiplications and divisions by decimal (tenths and hundredths pace, etc) • Addition and subtraction of fractions with different denominators	**Grade 7** Positive numbers, negative numbers • Necessity and meaning of positive and negative numbers (set of numbers and the 4 fundamental operations) • Four basic operations with positive and negative numbers Algebraic expressions using letters • Necessity and meaning of using letter • How to express multiplication and division • Additional and subtraction with linear expressions • Representing with algebraic expressions with letters (representations in inequality) Linear equations with one unknown • Meaning of equations and their solutions • Property of equality and how to solve equations • Solving and using linear equations (proportional expressions)
Elementary 1 • Natural numbers up to 1000 • Simple fractions • Additions and subtractions of 2-digit numbers • Additions and subtractions of simple 3-digit numbers	• The meaning and the representations of decimal numbers • Addition and subtraction of decimal numbers (the tenths place) • The meaning and the representation of fractions • Simple addition and subtraction of fractions with same denominator less than 1		
Elementary 2 • Natural numbers up to 10000 • Meaning of multiplication • Multiplication table • Multiplication of simple 2-digit numbers	**Grade 4** • Natural numbers less than billion • Round numbers, round up and round down • Division in the case where divisors are 2-digit numbers • Acquisition and utilization of 4 operations of natural numbers	**Grade 6** • Multiplication and division of fractions • Calculations that involve both fractions and decimals • Consolidation and utilization of the 4 basic operations of decimals and	**Grade 8** Calculations of 4 basic operations with expressions using letters • Calculations of addition and subtractions with simple polynomials, as well as multiplication and division with monomials Simultaneous linear equations with unknowns • Necessity and meaning of simultaneous linear equations with two unknowns and the meaning of their solutions • Meaning of simultaneous equations and their solutions • Solving simultaneous equations and applying them
	• Addition and subtraction of decimal numbers (the tenths and the hundredths places) • Multiplication and division of decimals by whole numbers • Addition and subtraction of fractions with same denominators (proper fraction, mixed numbers)		

These attachments are for the teachers' use.



6. Yearly Overview

Yearly overview is an essential and systematic plan of the grade content. It is helpful in the preparation of the yearly program to effectively plan for teaching strategies. The strand is outlined and identifies each unit and topic into different strand groups. The units are in sequential order from the first to the last unit.
Under each unit in the Overview, the topics for each lesson are also indicated. For all topics, the actual lesson numbers are given according to the student textbook.

Strands	Unit #	Unit Name and Sub- unit Name	Lesson #	sub unit #	TB page
Number and Operation	1	**Numbers up to 1000**			
		1. Numbers Larger than 100	1	1	6 - 9
			2	2	10/11
			3	3	12
			4	4	13
			5	5	14
			6	6	15
			7	7	16
		2. > and < Signs	8	1	17
		3. Addition and Subtraction	9	1	18
			10	2	19/20
		Exercise	11	1	21
		Problems 1 & 2	12	1	22/23
	2	**Thinking about How to Calculate**			
		Addition	13	1	24 - 26
		Subtraction	14	1	27 - 29
Measurement	3	**Time and Duration**			
		1. Time and Duration	15	1	30/31
		2. The Duration of One Day in Hours	16	1	32/33
			17	2	34/35
			18	3	35
		Exercise	19	1	36
		Problems 1 and 2	20	1	37/38
		Have you ever seen it?	21	1	39
Number and Operation	4	**Addition in Vertical Form**			
		1. Adding 2-digit Numbers	22	1	40/41
			23	2	42/43
			24	3	44
			25	4	44 - 46
			26	5	47 - 48
		2. Addition with 3-digit Answers	27	1	49
			28	2	50
		3. Addition of 3-digit Numbers	29	1	51
			30	2	52
		4. Rules of Addition	31	1	53/54
			32	2	54
		Exercise	33	1	55
		Problems 1 and 2	34	1	56/57
	5	**Subtraction in Vertical Form**			
		1. Subtraction of 2-digit Numbers	35	1	58/59
			36	2	60/61
			37	3	61
			38	4	62
		2.Subtracting from Numbers that are Larger than 100	39	1	63
			40	2	64
			41	3	65
		3. Subtraction of 3-digit Numbers	42	1	66
			43	2	67
		4. Relation between Addition and Subtraction	44	1	68
		5. What kind of Calculation is This?	45	1	69/70
		Exercise	46	1	71
		Problems 1 and 2	47	1	72/73

The column of Unit Names are highlighted by term colours such as term 1: green, term 2: orange, term 3: blue and term 4: Pink.
Finally, page numbers are attached to each lesson to easily identify the lesson topics for planning.
Note: In the Yearly overview, the term 'units' is used while the term 'chapter' is used in the textbook.

Strands	Unit #	Unit Name and Sub- unit Name	Lesson #	sub unit #	TB page
Measurement	6	Lengths			
		1. How to Compare	48	1	74/75
			49	2	76
		2. How to Represent Lengths	50	1	77
			51	2	78
			52	3	78/80
			53	4	80/81
		3. Metre	54	1	82/83
			55	2	83
		4. Let's Find the Lengths	56	1	84
			57	2	85/86
			58	3	86
		Exercise	59	1	87
		Problems 1 and 2	60	1	88/89
		Review	61	1	90/91
Data and Statistics	7	Tables and Graphs			
		1. Introduction of Tables and Graphs	62	1	92 -94
			63	2	94
			64	3	94
		Problems 1 and 2	65	1	95/96
		Have you ever seen it?	66	1	97
Measurement	8	Amount of Water			
		1. Comparing the Amounts of Water	67	1	98
		2. How to Measure the Amount of Water	68	1	99
		3. Smaller Measuring Cups	69	1	100
			70	2	101/102
		4. Finding Amount	71	1	102/103
		5. Very Small Amount of Water	72	1	104
		Exercise	73	1	105
		Problems 1 and 2	74	2	106/107
Number and Operation	9	Addition and Subtraction			
		1. Addition and Subtraction using Tape Diagrams	75	1	108/109
			76	2	110
			77	3	111
			78	4	112
			79	5	113
			80	6	114
			81	7	115
			82	8	116/117
			83	9	118/119
	10	Multiplication (1)			
		1. Sets of the same number	84	1	120/121
			85	2	122/123
			86	3	124/125
			87	4	126/127
			88	5	128
		Problems 1 and 2	89	1	129/130
		2. The order for multiplication	90	1	131/132
			91	2	132/133
	11	Multiplication (2)			
		1. The Multiplication Table of 2	92	1	134
			93	2	135
		2. The Multiplication Table of 5	94	1	136
			95	2	137
		3. The Multiplication Table of 3	96	1	138
			97	2	139
		4. The Multiplication Table of 4	98	1	140
			99	2	141
		5. Flash Card Games	100	1	142
			101	2	142/143
		Exercise	102	1	144/145

Strands	Unit #	Unit Name and Sub- unit Name	Lesson #	sub unit #	TB page
Number and Operation	12	**Multiplication (3)**			
		1. The Multiplication Table of 6	103	1	146
			104	2	147
		2. The Multiplication Table of 7	105	1	148
			106	2	149
		3. The Multiplication Table of 8	107	1	150
			108	2	151
		4. The Multiplication Table of 9	109	1	152
			110	2	153
		5. The Multiplication Table of 1	111	1	154
			112	2	154
		6. What Kind of Calculation Is This?	113	3	155
		Exercise	114	1	156
		Problems 1 and 2	115	2	157/158
	13	**Multiplication (4)**			
		1. Multiplication Table	116	1	159
			117	2	159/160
		2. Multiplication Games	118	1	161
			119	2	162
		3. Multiplication more than 9 x 9	120	1	163/164
			121	2	165/166
			122	3	167
		Problems 1	123	1	168
		Problems 2	124	2	169
		Review	125	1	170
		Have you ever seen it?	126	1	171
Geometry	14	Triangles and Quadrilaterals			
		1. Straight lines	127	1	172
		2. Triangles and Quadrilaterals	128	1	173
			129	2	174/175
			130	3	175/176
			131	4	176/177
		3. Right Angles	132	1	178
			133	2	179
		4. Rectangles and Squares	134	1	180
			135	2	181
			136	3	182
		5. Right Triangles	137	1	183
			138	2	184
		6. Making Patterns	139	1	185
		Exercise	140	1	186
		Problems 1 and 2	141	1	187/188
Number and Operation	15	**Large Numbers**			
		1. Numbers up to 10000	142	1	189
			143	2	190/191
			144	3	191
			145	4	192
			146	5	193
			147	6	194
		Exercise	148	1	195
		Problems 1 and 2	149	1	196/197
		Have you ever seen it?	150	1	198
	16	**Fractions**			
		Representation of Fractions	151	1	199/200
			152	2	200/201
			153	3	202
			154	4	202
		Problems	155	1	203
Geometry	17	**Shapes of Boxes**			
		1. Make a Nice Box	156	1	204/205
			157	2	205
			158	3	206
			159	4	207
			160	5	208
			161	6	209
		Problems	162	1	210
Summary	18	**Summary of the Grade 2**			
		Summary of the Grade 2	163	1	211
			164	2	212
			165	3	213
			166	4	214

Lesson Periods

Department of Education through the Standards-Based Curriculum for Grade 2 syllabus prescribed 300 minutes per week for mathematics lessons. This can be disintegrated to having at least 6 lessons of 30 minutes per week. In total for each term, a minimum of 8 weeks×6 lessons should cover a total of 48 lessons. Teachers have more than 192 lessons (48 lessons per term×4 terms) to teach mathematics per year. From the yearly overview, it can be noticed that there is a total of 166 lessons. That gives a surplus of 26 lessons for teachers. **The Department of Education advises teachers to utilize the surplus contact periods to teach a single lesson as a double period lesson for challenging topics to enhance pupils understanding and gives ample time to conduct review if pupils require more explanation, exercise or activities.**

Chapter 1 Numbers up to 1000

1. Unit Objectives

- To help pupils understand the meaning and the representations of numbers, and extend their ability to use numbers.
- To count objects by arranging them into groups of the same size, or by classifying them.
- To understand the representations of numbers up to 1000, understand sizes and the order of the numbers by applying the decimal positional numeration system.
- To understand relative sizes of numbers by considering 10 or 100 as one unit.

2. Teaching Overview

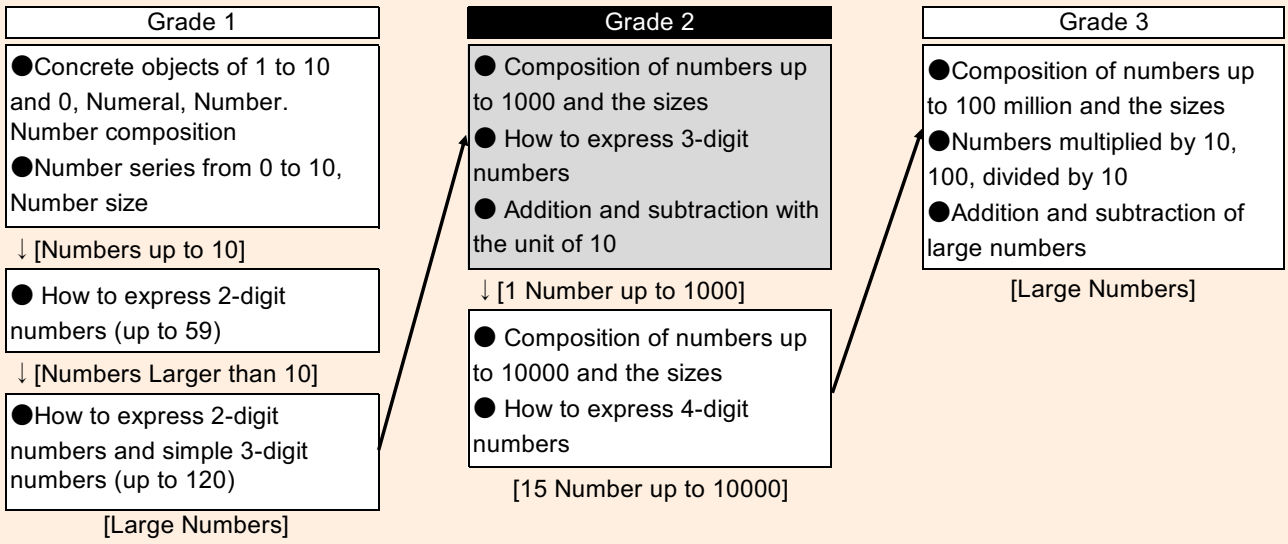
In this unit, the numbers up to 100 learned in grade 1 are expanded to numbers up to 1000 (thousand).

Number Larger than 100: Pupils think about how to count the number of rolls by devising ways to count them. Also, when counting the same number of blocks as the number of rolls, make them aware that it is easier to count by putting 10 or 100 into each box.
Next, help pupils understand how to represent and read numbers in connecting to the base 10 place value system. In addition, pupils understand the order, number sequence, and number size of 3-digit numbers using number lines.

> and < Signs: Pupils understand that when comparing 3-digit numbers, they can be compared from the hundreds place. In addition, the numbers on the right side of the number line are larger. Also, pupils understand how to use the signs + and −.
Addition and Subtraction: Pupils understand addition and subtraction in units of 10.

Key Concepts: Number larger than 100, Number up to 1000.

3. Related Learning Contents



Unit 1

Unit: Numbers up to 1000
Sub-unit: 1. Numbers Larger than 100
Lesson 1 of 7

Textbook Page : p.6~9
Actual Lesson 001

Sub-unit Objectives

- Understand the compositions of the numbers up to 1000, how to read and write them.
- Recognise the order and sequence of three-digit numbers.

Lesson Objective

- To find an efficient way of counting concrete and semi-concrete objects whose quantity is more than 100 (three-digit numbers).

Prior Knowledge

- Numbers larger than 10 (Grade 1 unit 7).
- Large numbers (Grade 1 unit 14).

Preparation

- Enlarged picture of students in textbook page 7.

Assessment

- Identify ways to count quantity more than 100. F

Teacher's Notes

Teaching Tips: Manipulative Activities in Mathematics. (Reference: About mathematical activities such as operations)
Pupils have learnt in grade 1 about making sets of 10 when counting the numbers. Teacher can introduce various manipulative activities with the use of concrete objects and practice making sets of 10.

Teaching Tips: Usefulness of counting objects by 10s and 100s. (Reference: Advantages of counting by 10 and by 100)
Pupils have learnt in grade 1 about making sets of 10 and count the numbers of objects in large quantities. In this lesson teacher should let pupils recognise and further think how to arrange and count more easily which is counting by sets of 10s and by 100s.



Lesson Flow

INTRODUCTION

1 Pre-discussion on p.6.

T Introduction to the unit "Have you ever seen this?"

T/P Try to count the number of buns, and then start to associate the numbers shown in the pictures with various numbers they can find around them.

BODY

2 Introduce the main task.

T Introduce the main task 'Let's explore various ways of counting numbers.'

3 ▶▶ Let's guess the number of students we can see in the picture.

T How many students do you think are there?

TN Pupils should think of how they can count the number of students and guess the total number of students and then work out the number of students.

T How can we count the number of students?

P Discuss ways of counting large quantities.

4 1 Identify ways of counting large numbers in sets.

T How many buns are there altogether? How can we count them?

P Count the buns by 2s, 5s, and 10s in sets.

T Let's try to count the number of buns by making sets of 10.

TN
- Encourage pupils to count objects in sets of 10s as there are many to count.
- Suggest to pupils to keep a tally of every count in their exercise book or use mathematics blocks.

T Let's present our results.

P We can make 23 sets of 10 buns. Remaining are 5 buns.

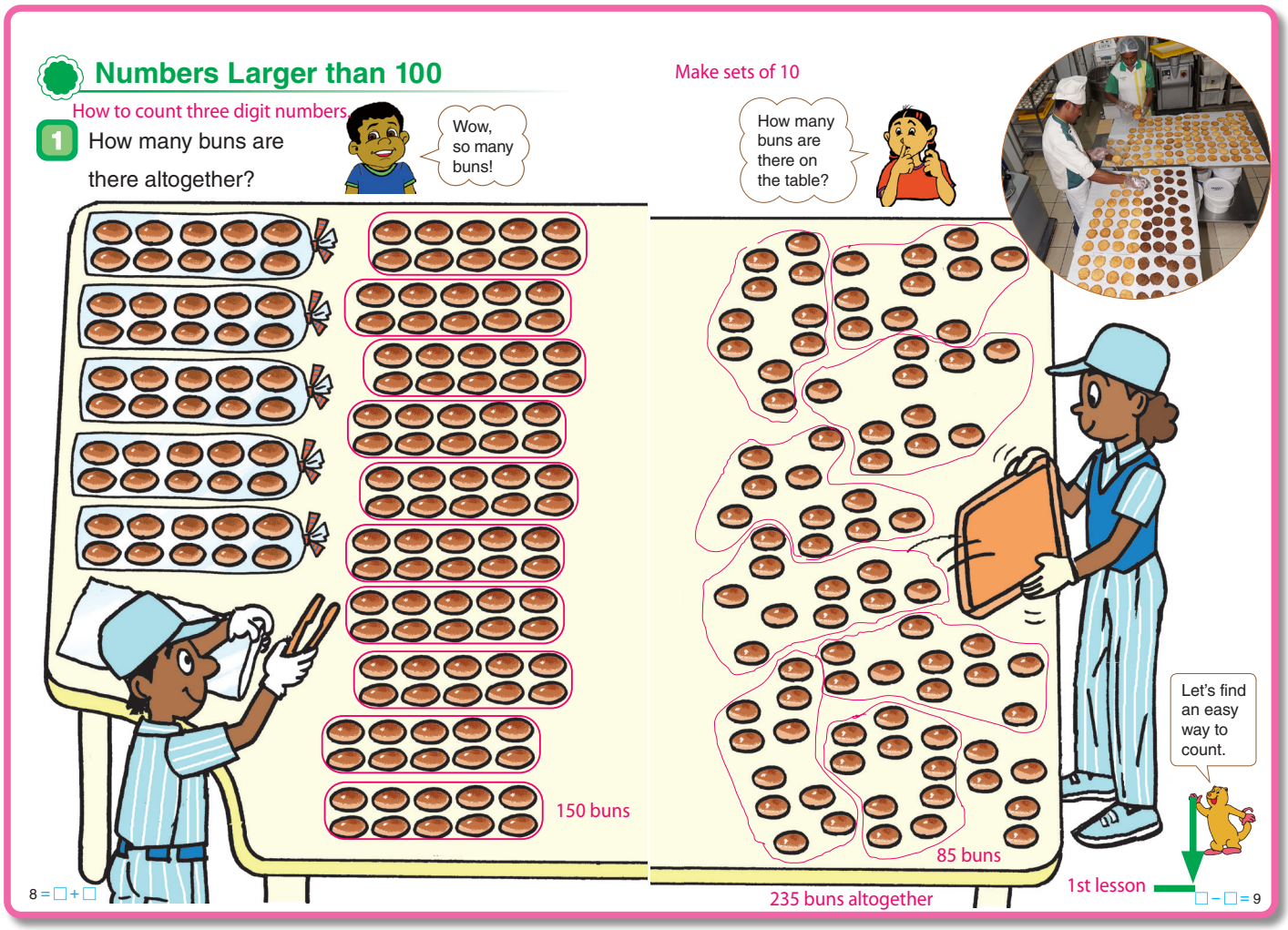
TN Introduce the idea of grouping 10 sets of 10 buns as a set, or pupils can check to see if the number of buns in the picture totals up to 235.

CONCLUSION

5 Summary.

T/P Summarise the lesson by confirming pupils' understanding of the main ideas in the lesson.

Due to space limitations, the Sample Blackboard Plan is placed on page 7.



Unit 1

Unit: Numbers up to 1000
Sub-unit: 1. Numbers Larger than 100
Lesson 2 of 7

Textbook Page : p.10~11
Actual Lesson 002

Lesson Objective

- To understand the compositions of three digit numbers, how to read and write them, and the meaning of the hundreds place.

Prior Knowledge

- Counting numbers up to 10.

Preparation

- Mathematics blocks, boxes that can contain 10 and 100 mathematics blocks, place value chart, enlarged pictures from the textbook.

Assessment

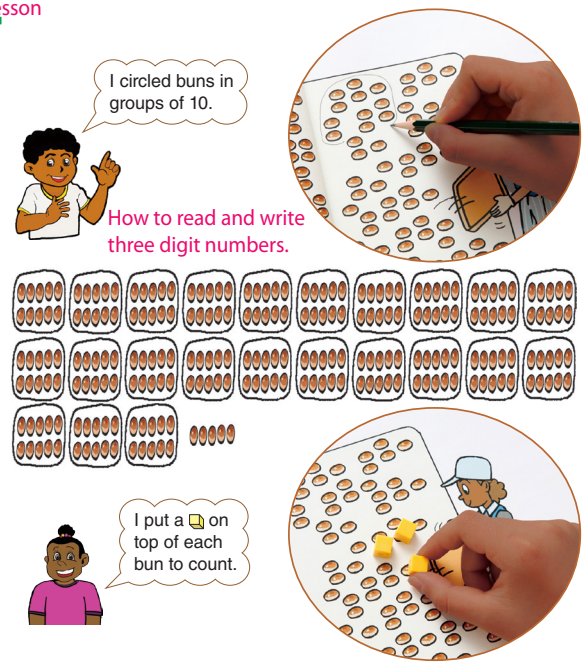
- Understand the meaning of hundreds place. F S
- Read and write three digit numbers. F S

Teacher's Notes

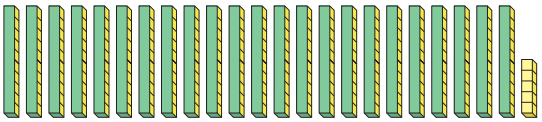
Teaching Tips: Compositions of three digit numbers and use of terms.
The composition of three digit numbers should be acquired with reference to the pictures of blocks with the use of terms such as ones place, tens place and hundreds place.

Teaching Tips: Usefulness of the decimal positional numeration system (Advantages of decimal notation)
This can be described as follows.
① Any number, either whole numbers or decimal numbers, can be represented with the use of only 10 numbers from 0 to 9.
② The sizes of numbers can be compared easily in the decimal positional numeration system.

2nd lesson

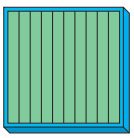


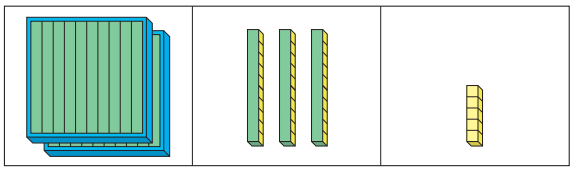
1 Let's put in a box of 10.



There are 23 boxes of 10 and 5 ones blocks.

2 10 sets of 10 boxes make 100.
Then, there are 2 sets of 100.



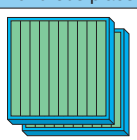
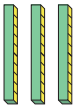


3 How can we say the number? 235

2 sets of 100 is **two hundred**.

Two hundred, thirty, and five is called **two hundred and thirty five**, and it is written as 235.

The position where 2 is in 235, is called the **hundreds place**.

Hundreds place	Tens place	Ones place
		
two hundred	thirty	five
2	3	5

2nd lesson

10 = □ + □

□ − □ = 11

Lesson Flow

INTRODUCTION

1 Review.

T/P Review key ideas from the previous lesson.

BODY

2 Introduce the main task.

T Introduce and explain the main task: "How can we arrange the number of blocks more simply to be able to tell the number of buns?"

3 Represent the buns with the mathematics blocks and think how they can arrange the blocks to count the number more easily.

T/P Let's replace a bun with a block and think about how we can arrange the blocks to count more easily.

P Replace the buns with the same number of blocks and think of ways to count the blocks.

4 Think about the number of blocks in total.

T How can we describe the number of blocks?

TN Teacher can put up a place value chart so pupils can identify each numbers place in association with that of the blocks placed.

P Describe the number of blocks.

T/P Discuss and explain the following:

- 2 sets of 100 is two hundred.
- Two hundred, thirty and five is called two hundred and thirty-five.
- It is written as 235.

5 Learn about the meaning of the hundreds place and understand how to read and write the number; 235.

T Demonstrate the basics of 10 sets of 1 is 10 and that 10 sets of 10 is 100.

P ① There are [23] boxes of tens and [5] ones blocks.

TN One box can hold up to ten singles only.

T ② Let pupils to fill in the [ ].

P There are [2] sets of 100.

T ③ Introduce 235 to pupils.

TN With the use of a place value chart and mathematics blocks, Teacher can confirm with pupils the following points;

① Only up to 9 blocks can be placed in the ones place.

② When there are 10 separate pieces of blocks, those 10 blocks can be put into a box of 10 and placed in the tens place.

③ Only up to 9 boxes of 10 can be placed in the tens place.

④ When there are 10 boxes of 10, those boxes can be put into a box of 100 and placed in the hundreds place.

CONCLUSION

6 Summary.

T/P Summarise the lesson by confirming pupils' understanding of the main ideas in the lesson.

Sample Blackboard Plan

Date: **Chapter 1**: Numbers up to 1000 **Sub-chapter 1:** Numbers Larger than 100 **Lesson** 2 of 2

Main Task: How can we arrange the blocks more simply to be able to tell the number of buns

Review

We can count numbers more easily when we count by 2s, 5s or 10s.

Activities

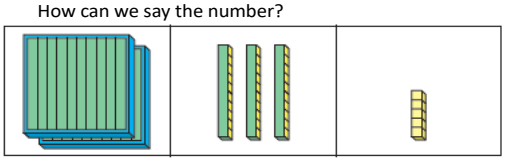
Let's replace the buns with the blocks

① Let's put the single box in a box of 10

There are [23] boxes of 10 and [5] ones

② 10 sets of 10 boxes make 100. Then there is [1] set of 100.

How can we say the number?



Hundreds place	Tens place	Ones place
2	3	5

Summary

235

- 2 sets of 100, 3 sets of 10, and 5 is called two hundred and thirty-five.
- Two hundred and thirty-five is written as 235.
- The position where 2 is in 235 is called the hundreds place.

Exercise

1. ① 562
   ② 117
2. 322 pencils
3. ① one hundred and thirty-six
   ② three hundred and seventy-nine
   ③ five hundred and sixteen
   ④ eight hundred and forty-seven
4. ① 734
   ② 157
   ③ 495
   ④ 611

Unit 1

Unit: Numbers up to 1000
Sub-unit: 1. Numbers Larger than 100
Lesson 3 of 7

Textbook Page : p.12
Actual Lesson 003

Lesson Objectives

- To understand the compositions of three digit numbers in a place value chart.
- To read and write three digit numbers in a place value chart.
- To understand the meaning of the hundreds in a place value chart.

Prior Knowledge

- Large numbers (Grade 1 unit 14).
- Structure of place value table.

Preparation

- Mathematics blocks, boxes that can contain 10 and 100 mathematics blocks, place value chart, enlarged pictures from the textbook.

Assessment

- Read and write three digit numbers on a place value chart. F S

3rd lesson Exercise

1 How many ▭ are there altogether?

① Hundreds place | Tens place | Ones place
5 | 6 | 2 — 562 blocks

② Hundreds place | Tens place | Ones place
1 | 1 | 7 — 117 blocks

2 How many pencils are there?

322 pencils

3 Let's read the following numbers.

① 136 (1. One hundred and thirty-six) ② 379 (2. Three hundred and seventy-nine) ③ 516 (3. Five hundred and sixteen) ④ 847 (4. Eight hundred and forty-seven)

4 Let's write the following numbers.

① The number when seven hundred, thirty, and four are added together. 734

② The number when one hundred, fifty, and seven are added together. 157

③ The sum of 4 sets of 100, 9 sets of 10, and 5 sets of 1. 495

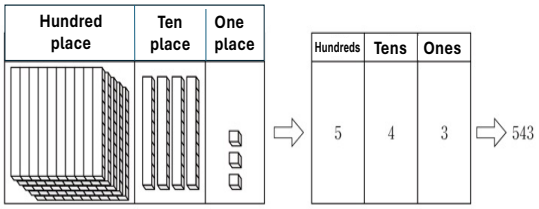
④ The sum of 6 sets of 100, 1 set of 10, and 1. 611

3rd lesson

12 = □ + □

Teacher's Notes

To understand number compositions is a difficult content for many pupils at this stage. To help pupils understand better and to avoid a lesson only with abstract numbers, it is effective to use a place value chart in learning. For pupils who have great difficulty in understanding the concept, Teacher can repeatedly provide follow-up instruction and let them enjoy various manipulative activities such as letting them use mathematic blocks to make sets of the blocks by 100, 10 and 1, and having them write the number of each set on a place value chart.



Lesson Flow

INTRODUCTION

1 Review.

T/P Review key ideas from the previous lesson.

P They will recall from previous lesson that there were 23 sets of 10 buns and 5 remaining buns.

TN By looking at the picture on page10, pupils remember they counted the number of buns by making sets of 10 and 100.

BODY

2 Introduce the main task.

T Introduce and explain the main task: 'Solve the problems in the exercise.'

3 Introduce the exercise.

T/P Introduce and explain the exercises.

4 Do exercises.

P Pupils write in their notebooks their answers for Problems ① ② in 1 and 2.

Lesson Flow

TN If there are pupils who answer the problem 2 by simply lining up all the numbers as 300, 20 and 2, advise them to use a place value chart and put objects such as pencils in each place to understand how to represent numbers correctly.

TN Pupils practice spelling out the numbers in the problem 3.

TN For pupils who have difficulty with the problem 4, Teacher can advise them to use a place value chart and mathematics blocks to actually visualise the numbers with objects, and recognise the number compositions.

CONCLUSION

5 Summary.

T/P Summarise the lesson by confirming pupils' understanding of the main ideas in the lesson.

Sample Blackboard Plan

Date: **Chapter 1**: Numbers up to 1000 **Sub-chapter 1:** Numbers Larger than 100 **Lesson** 1 of 7

Main Task: Let's explore various ways of counting numbers

Review

Have you ever seen this?



Activities

Explore various ways of counting the numbers

Naiko's Idea
Circle the buns by 2s

Make sets of 10 rolls.
Count how many sets of 10 we get, and mark when it reaches 100.

Yamo's Idea
Circle the buns by 5s

Make sets of 10 rolls.
Count how many sets of 10 we get, and mark when it reaches 100.

Vavis' Idea
Circle the buns by 10s

Make sets of 10 rolls.
Count how many sets of 10 we get, and mark when it reaches 100.

Summary

- We can count by 2s, 5s and 10s
- It is easier if we use boxes to mark the objects that are counted

Sample Blackboard Plan

Date: **Chapter 1**: Numbers up to 1000 **Sub-chapter 1:** Numbers Larger than 100 **Lesson** 3 of 7

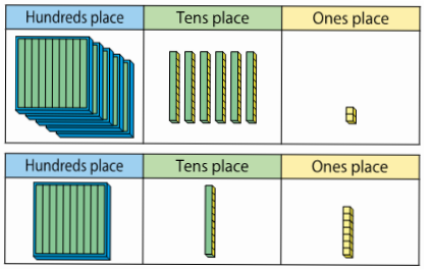
Main Task: Solve the problems in the exercise

Review

The number that is made up of 10 sets of 10 is 100.
In the number 235, 2 is in the hundreds place.

Exercise

1 How many are there altogether?



562

117

2 How many pencils are there?



322

3 Let's read the following numbers.

136 379 516 847

Let's write the following numbers
1. 734
2. 157
3. 495
4. 611

Summary

- In a three digit number, there are three place values, the ones, tens and hundreds

Unit 1

Unit: Numbers up to 1000
Sub-unit: 1. Numbers Larger than 100
Lesson 4 of 7

Textbook Page : p.13
Actual Lesson 004

Lesson Objective

- To understand how to read and write numbers when there is nothing in the ones or tens place, or in both places.

Prior Knowledge

- Large Numbers.
- Structure of place value table.

Preparation

- Mathematics blocks, place value chart
- Supplementary Problems (if time allows students can work on this problems):

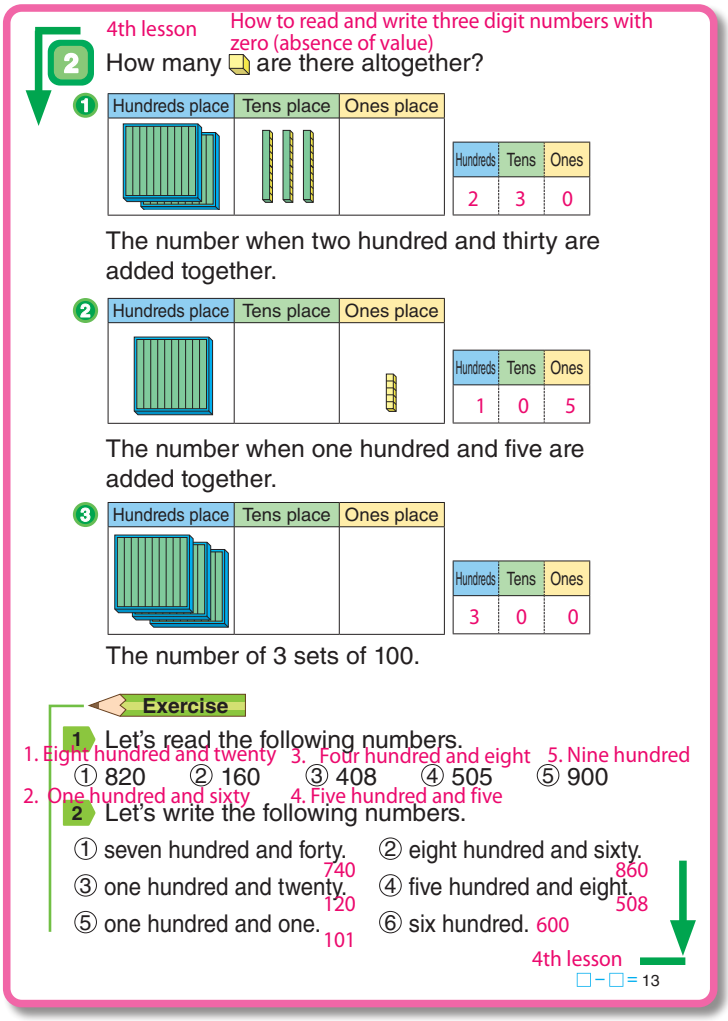
1. Let's read the following numbers.
- 910 (nine hundred and ten).
- 209 (two hundred and nine).
- 400 (four hundred).
- 800 (eight hundred).

2. Let's write the following numbers.
- one hundred and ten (110)
- five hundred and six (506)
- seven hundred (700)

3. Let's read and write the following numbers.
   i. The number that has 6 in the hundreds place, 3 in the tens place and 0 in the ones place (630, six hundred and thirty)
   ii. The sum of 7 sets of 100, 0 set of 10 and 8 set of 1. (708, seven hundred and eight)
   iii. The sum of 3 sets of 100 and 6 sets of 10. (360, three hundred and sixty)
   iv. The sum of 9 sets of 100 and 7 sets of 1. (907, nine hundred and seven)
   v. The sum of 38 sets of 10 and 8 sets of 1. (388, three hundred and eighty-eight)

Assessment

- Read and write numbers with zero as one of the digits on a place value chart. F S



Teacher's Notes

Significance of Zero in 3-digit numbers:
The number zero does not make any contribution to a 3-digit number if it is placed in a position where there are no other non-zero numbers to its left. So how is 303 different from 033 or even 003? In 033, the values are
$(0 \times 100) + (3 \times 10) + (3 \times 1) = 0 + 30 + 3 = 33$
which means that the number actually becomes a 2-digit number, i.e., 33, or in the case of 003, it becomes a single-digit number, i.e., 3. In these two examples, the zero does not contribute any value to the number, so the numbers can be expressed as 33 or 3 as well.

Lesson Flow

INTRODUCTION

1 Review.

T/P Review key ideas from the previous lesson.

BODY

2 Introduce the main task.

T Introduce and explain the main task "read and write three digit numbers with no tens or no ones."

3 2 Write numbers when there are no blocks in the tens and ones place.

T/P Discuss and recognise the difference between the previously learned 235 and the given numbers in 1 2 3. And try to identify the places without blocks.

P Recall how they write 20, 50 or 100

TN Pupils come to realise that when there are no blocks in certain places, they can put 0 (zero).

P Read and understand the activities 1, 2 and 3, and write their answers.

T Introduce the term "digit" and tell pupils that 235 and 230 have three digit numbers.

4 Exercise.

TN With problem 1, teacher can advise pupils to use the mathematics blocks and place value chart to describe each number.
Teacher can also advice pupils to firstly identify which place has no blocks and then tell the answers.

TN With the problem 2, Teacher can advise pupils to firstly identify which place value on the chart should have 0 and then write the answers.

TN Pupils that are advance can work on Supplementary Problems.

CONCLUSION

5 Summary.

T/P Summarise the lesson by confirming pupils' understanding of the main ideas in the lesson.

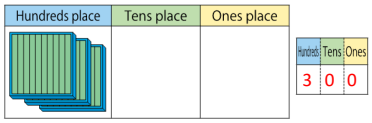
Sample Blackboard Plan

Date: **Chapter 1**: Numbers up to 1000 **Sub-chapter 1:** Numbers Larger than 100 **Lesson** 4 of 7

Main Task: Read and Write three digit numbers with no tens or no ones

Review

- In a three digit number, there are three place values, the ones, tens and hundreds



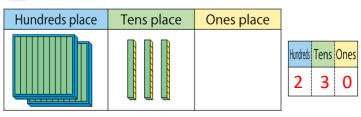
The number of 3 sets of 100.

Summary

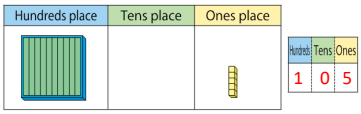
- When there are no blocks in a place value, we write 0 in that place value

Activity

2 How many are there altogether?



The number when two hundred and thirty are added together.



The number when one hundred and five are added together.

Exercise

1 Let's read the following numbers.
① 820 ② 160 ③ 408 ④ 505 ⑤ 900

2 Let's write the following numbers.

① 740	② 860
③ 120	④ 508
⑤ 101	⑥ 600

Unit 1

Unit: Numbers up to 1000
Sub-unit: 1. Numbers Larger than 100
Lesson 5 of 7

Textbook Page : p.14
Actual Lesson 005

Lesson Objective

- To understand the compositions and sequence of three digit numbers.

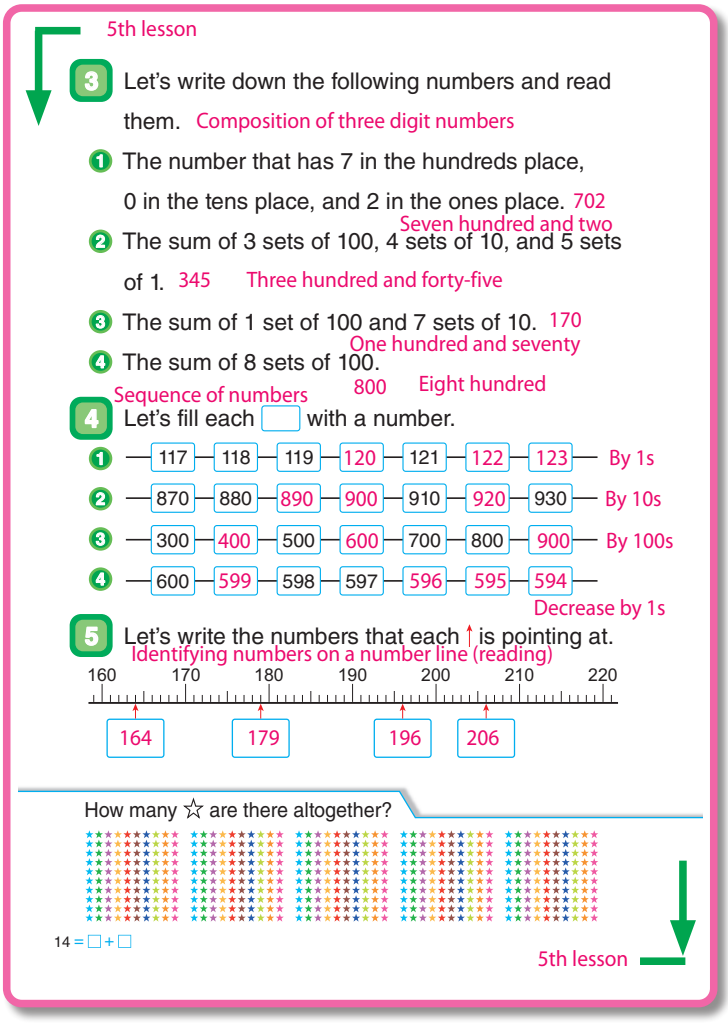
Prior Knowledge

- Number Line.

Preparation

- Place value chart, enlarged chart of sequenced numbers on p.14, number line chart for posting on the blackboard.
- Supplementary Problems (if time allows students can work on this problems).

1. Let's write the following numbers.
   i. The sum of 7 sets of 100, 5 sets of 10 and 3 sets of 1
   ii. The sum of 6 sets of 100 and 9 sets of 1
   iii. The sum of 1 set of 100 and 4 sets of 10
   iv. The sum of 6 sets of 100


5th lesson

3 Let's write down the following numbers and read them. Composition of three digit numbers

1 The number that has 7 in the hundreds place, 0 in the tens place, and 2 in the ones place. 702

2 The sum of 3 sets of 100, 4 sets of 10, and 5 sets of 1. 345 Seven hundred and two / Three hundred and forty-five

3 The sum of 1 set of 100 and 7 sets of 10. 170

4 The sum of 8 sets of 100. 800 One hundred and seventy / Eight hundred

4 Let's fill each ☐ with a number. Sequence of numbers

1 117 118 119 120 121 122 123 — By 1s

2 870 880 890 900 910 920 930 — By 10s

3 300 400 500 600 700 800 900 — By 100s

4 600 599 598 597 596 595 594 — Decrease by 1s

5 Let's write the numbers that each ↑ is pointing at. Identifying numbers on a number line (reading)

160 170 180 190 200 210 220

164 179 196 206

How many ☆ are there altogether?

14 = ☐ + ☐

5th lesson

Assessment

- Understand the composition and sequence of three digit numbers. F
- Identifying numbers on a number line. S

Teacher's Notes

Teaching Tips: Learning activities using a number line.

Pupils have already leant about a number line in the 1st grade. In grade 2, it is important that they become more familiar with the use of a number line in order to use it properly in the upper grades.

Teacher should have pupils confidently use a number line to identify the sizes, order and sequence of numbers. On p.14, the presented number line is marked by 100s, which would require pupils to identify what each of the smaller marks indicates; an advanced skill to read and use a number line.

The number line is often used in the upper grade and here in grade 2, pupils should be well exposed and familiarised with a number line through various learning activities such as the use of number lines marked by 10s or 50s, or identification of missing numbers on a number line. Teacher should understand that this Exercise on number lines in p.14 is not only for the purpose of solving the given problems but also for the purpose of making pupils feel familiar with number lines.

Lesson Flow

INTRODUCTION

1 Review.

T/P Review key ideas from the previous lesson.

BODY

2 Introduce the main task.

T Introduce and explain the main task "Let's think of the compositions of three digit numbers."

3 3 Composition of three digit numbers

T Let's write the following numbers.

TN This activity aims for understanding the compositions of three digit numbers. For pupils who have difficulty coming up with answers, Teacher can advise them to use a place value chart to identify what number is in each place.

4 4 Read and think about the given problems.

T Let's look at the numbers and think about how they increase or decrease.

TN Teacher advises pupils that the numbers are sequenced in line with some rules and tells them to examine how the numbers increase or decrease.

P Come to realise the following patterns:
In the problem 1, the numbers increase by 1s.
In the problem 2, the numbers increase by 10s, i.e. from 870 to 880.
In the problem 3, the numbers increase by 100s, i.e. from 700 to 800.
In the problem 4, the numbers decrease by 1s, i.e. from 598 to 597.

5 5 Let's study the number line and identify the position of the number.

T Let's find and write down the numbers marked by the arrows on the number line.

TN Teacher has pupils recognise that the number line is marked by tens.

TN Teacher also has them recognise that each small mark indicates 1.

6 How many stars are there altogether?

TN Get pupils to identify the number of stars on page 14 only. Pupils can count easily by using the sets of 10 or 100.

CONCLUSION

7 Summary.

T/P Summarise the lesson by confirming pupils' understanding of the main ideas in the lesson.

Sample Blackboard Plan

Date: **Chapter 1**: Numbers up to 1000 **Sub-chapter 1:** Numbers Larger than 100 **Lesson** 5 of 7

Main Task: **Composition and sequence of three digit numbers and identifying them on a number line**

Review

- When there are no blocks in a place value, we write 0 in that place value

Activity

3

	Hundreds place	Tens place	Ones Place	
①	7	0	2	Seven hundred and two
②	3	4	5	Three hundred and forty-five
③	1	7	0	One hundred and seventy
④	8	0	0	Eight hundred

4 Let's think about how number increase and decrease

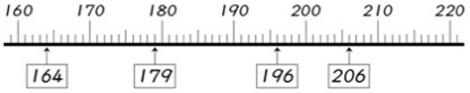
① 117–118–119–[120]–121–[122]–[123] by 1s

② 870–880–[890]–[900]–910–[920]–930 by 10 s

③ 300–[400]–500–[600]–700–800–[900] by 100 s

④ 600–[599]–598–597–[596]–[595]–[594] Decreased by 1s

5



Summary

- Each small line on the number line increases by 1.

Unit 1

Unit: Numbers up to 1000
Sub-unit: 1. Numbers Larger than 100
Lesson 6 of 7

Textbook Page : p.15
Actual Lesson 006

Lesson Objectives

- To recognise the size of 1000 (one thousand), the sequence and compositions of large numbers.
- To count the number of ★ by devising a way of counting.

Prior Knowledge

- Number Line.

Preparation

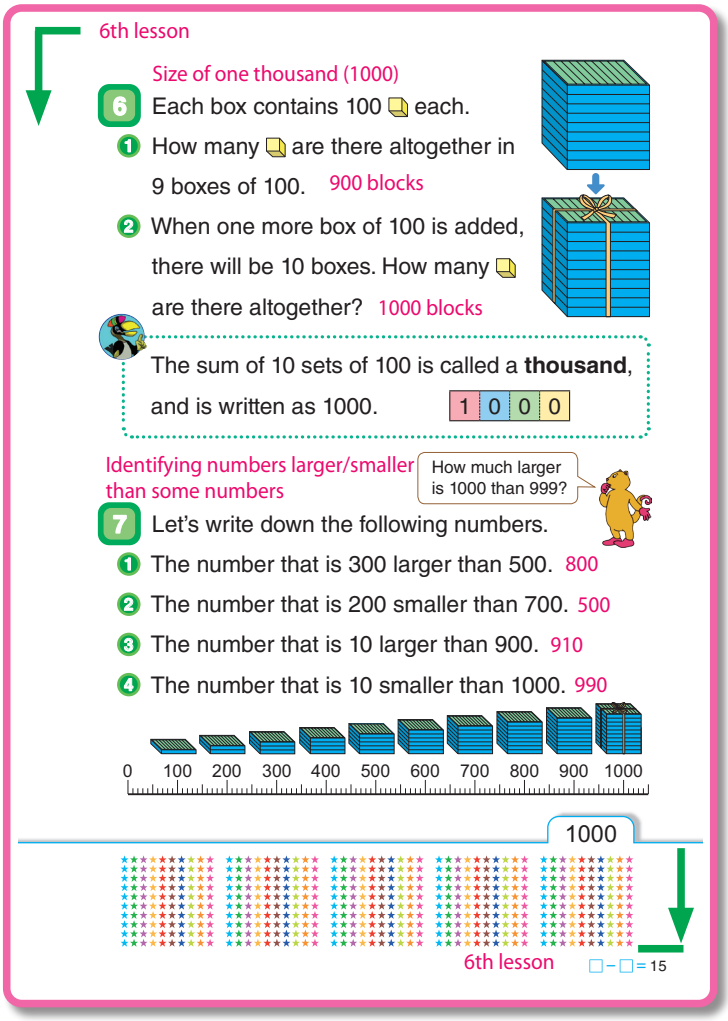
- 10 boxes containing 100 blocks each, number line chart for posting on the blackboard, enlarged picture from the textbook.

Assessment

- Identify the size of 1000. F S
- Interpret the sequence and composition of large numbers. F S

Teacher's Notes

Teaching Tips: Learning activities with a number line (Reference: Learning activities using number lines)
Teacher should have pupils confidently use a number line to identify the sizes, order and sequence of numbers. On p.15, the presented number line is marked by 100s, which would require pupils to identify what each of the smaller marks indicates; an advanced skill to read and use a number line.
Teacher should understand that this Exercise on number lines in p.14 and p.15 is not only for the purpose of solving the given problems but also for the purpose of making pupils feel number lines familiar.



Lesson Flow

INTRODUCTION

1 Review.

T/P Review key ideas from the previous lesson.

BODY

2 Introduce the main task.

T Introduce and explain the main task "Let's think about how to represent the number that has 10 sets of 100."

3 ⑥ Add boxes of 100 blocks

T Think of how many blocks we can get when we add boxes of 100 blocks one by one.

TN Teacher demonstrates to the class adding boxes of 100 one by one; visualisation of an increase in quantity.

P ① Identify the number of blocks for each of the following cases; when there are 7 boxes of 100 blocks, 8 boxes and 9 boxes.

② Come to understand when 1 more box is added to 9 boxes, making it 10 boxes, the number of all the blocks reaches 1000.

4 Important point .

T/P Practice how to read and write "one thousand."

TN The term "the thousands place" is to be taught later, in the third term.

5 ⑦ Let's identify numbers on a number line.

T Let's find out the numbers as described in the following problems.

TN In Problem ①, pupils should practice using a number line to identify the number. First let pupils point at 500 with their fingers or pencils, and moving 300 to the right to see what number they get.

TN Pupils come to understand that each of the small marks indicates 10 on this number line. Problem ③, they should start at 900 and move 1 mark (=10) to the right, and in Problem ④ they should start at 1000 and move 1 mark (=10) to the left.

6 Let's locate 1000 on the number line

T Let's count the number of ★.

P Understand that the number which has 10 sets of 100 is 1000 and that 1000 is a number 100 larger than 900.

P See the picture of 1000 stars ★ at the bottom of p.14-15 and recognise the size of 1000.

CONCLUSION

7 Summary.

T/P Summarise the lesson by confirming pupils' understanding of the main ideas in the lesson.

Sample Blackboard Plan

Date: **Chapter 1**: Numbers up to 1000 **Sub-chapter 1:** Numbers Larger than 100 **Lesson** 6 of 7

Main Task: Let's think about how to represent the number that has 10 seats of 100?

Review

- Each small line on the number line increases by 1.

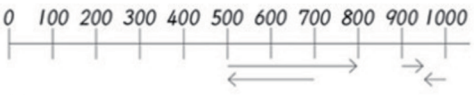
Activity

6 How many boxes are there altogether in 9 boxes of 100
If there are 10 boxes of 100, how many cubes are there altogether?

1 box.....100	6 boxes.....600
2 boxes.....200	7 boxes.....700
3 boxes.....300	8 boxes.....800
4 boxes.....400	9 boxes.....900
5 boxes.....500	**10 boxes.....1000**

The sum of 10 sets of 100 is called a thousand, and is written as 1000.

7 Let's write down the following numbers.



① The number that is 300 greater than 500
② The number that is 200 smaller than 100
③ The number that is 10 larger than 900
④ The number that is 10 smaller than 1000

Summary

What is "1000"?

- It is the number next to 900 on the number line marked by 100s.
- It is the number next to 990 on the number line marked by 10s.
- It is the number that is 300 greater than 700.
- It is the number next to 950 on the number line marked by 50s.
- It is the number that is 1 greater than 999.
- It is the number that is 200 greater than 800.

Unit 1

Unit: Numbers up to 1000
Sub-unit: 1. Numbers Larger than 100
Lesson 7 of 7

Textbook Page : p.16
Actual Lesson 007

Lesson Objective

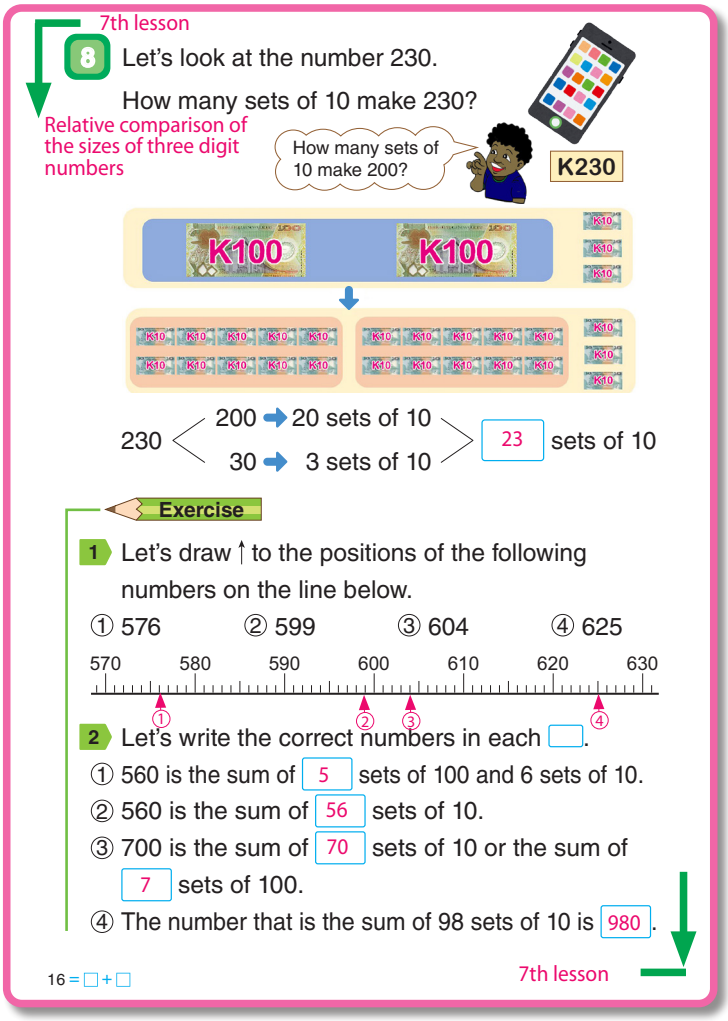
- To understand the relative sizes of three digit numbers.

Prior Knowledge

- Large numbers.
- Number Line.

Preparation

- Models of K10 and K100 note (for teacher's demonstration and for pupils' use), number line chart for posting on the blackboard
- Supplementary Problems (Students can work on these problems if time allows)
  1. How many sets of 10 make the following numbers?
  2. Let's write the following numbers:
     a) The sum of 28 sets of 10.
     b) The sum of 40 sets of 10.



Assessment

- Identify the relative size of three digit numbers. F S

Teacher's Notes

Teaching points

- Three-digit numbers can be composed additively from hundreds, tens and ones; this structure can be used to support additive calculation.
- Each number on the 0 to 1,000 number line has a unique position.
- The smallest three-digit number is 100, and the largest three-digit number is 999; the relative size of two three-digit numbers can be determined by examining the hundreds digits, then the tens digits, and then the ones digits, as necessary.
- Three-digit multiples of ten can be expressed multiplicatively and additively, in terms of tens or hundreds.
- Known facts and strategies for addition and subtraction within and across ten, and within and across 100, can be used to support additive calculation within 1,000.

Familiar counting sequences can be extended up to 1,000.

Lesson Flow

INTRODUCTION

1 Review.

T/P Review key ideas from the previous lesson.

T Ask pupils to recall the sum of 10 sets of 100.

P Pupils response, 10 sets of 100 is called 1000.

BODY

2 Introduce the main task.

T Introduce and explain the main task. 'Let's make K230 in various ways'

3 8 How many sets of K10 make K230?

T How many sets of 10 make 200?

TN For pupils to manipulate objects and think, teacher tells them to prepare model notes.

T Ask pupils to fill in the ☐.

P Understand that 230 can be observed as the sum of 2 sets of 100 and 3 sets of 10, and also as 23 sets of 10.

4 Exercise.

TN In Problem 1, pupils recognise that each of the small marks indicates 1 and show the positions of the given numbers on the number line in the presentation. Ask pupils to point the position on the number line. Regarding the number 599, Teacher explains that when they move 1 mark to the left from 600, it is 599.

TN The Problem 2 may be challenging for some pupils. For such pupils, Teacher can tell them to use K10 and K100 model notes to have better understanding.

CONCLUSION

5 Summary.

T/P Summarise the lesson by confirming pupils' understanding of the main ideas in the lesson.

Sample Blackboard Plan

Date: **Chapter 1**: Numbers up to 1000 **Sub-chapter 1:** Numbers Larger than 100 **Lesson** 7 of 7

Main Task: Let's make 230 in various ways.

Review

- What is 1000?

Review previous summary points.

Activity

8 Let's make K230 in various ways

When we use 100 kina notes and 10 kina notes:

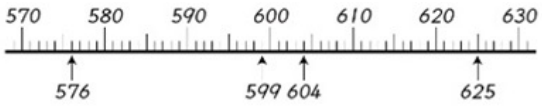
2 sets of K100 note
3 sets of K10 notes

When we use 10 kina notes only:

23 sets of K10 notes

Exercise

1



2

① 560 is the sum of 5 sets of 100 and 6 sets of 10.

② 560 is the sum of 56 sets of 10.

③ 700 is the sum of 70 sets of 10 or the sum of 7 sets of 100.

④ The number that is the sum of 98 sets of 10 is 980.

Summary

A number with some hundreds and some tens can be represented with units 10 and 100 (230 = 2 sets of 100 and 3 sets of 10). It can be also represented with a unit 10 only (23 sets of 10).
A number with some hundreds can be represented with a unit 100 (700 = 7 sets of 100). It can be also represented with a unit 10 (70 sets of 10).

Unit 1

Unit: Numbers up to 1000
Sub-unit: 2. > and < Signs
Lesson 1of 1

Textbook Page : p.17
Actual Lesson 008

Sub-unit Objective

- To understand how to compare three digit numbers.

Lesson Objectives

- To recognise the sizes of three digit numbers.
- Compare numbers on a number line.

Prior Knowledge

- Large Numbers.
- Three digit numbers.
- Number Line.

Preparation

- Number line chart for posting on the blackboard, place value chart.

Assessment

- Represent the sizes of numbers, the meaning and use of signs of equality and inequality. F S
- Distinguish the sizes of two numbers. F S

Teacher's Notes

To compare three-digit numbers:

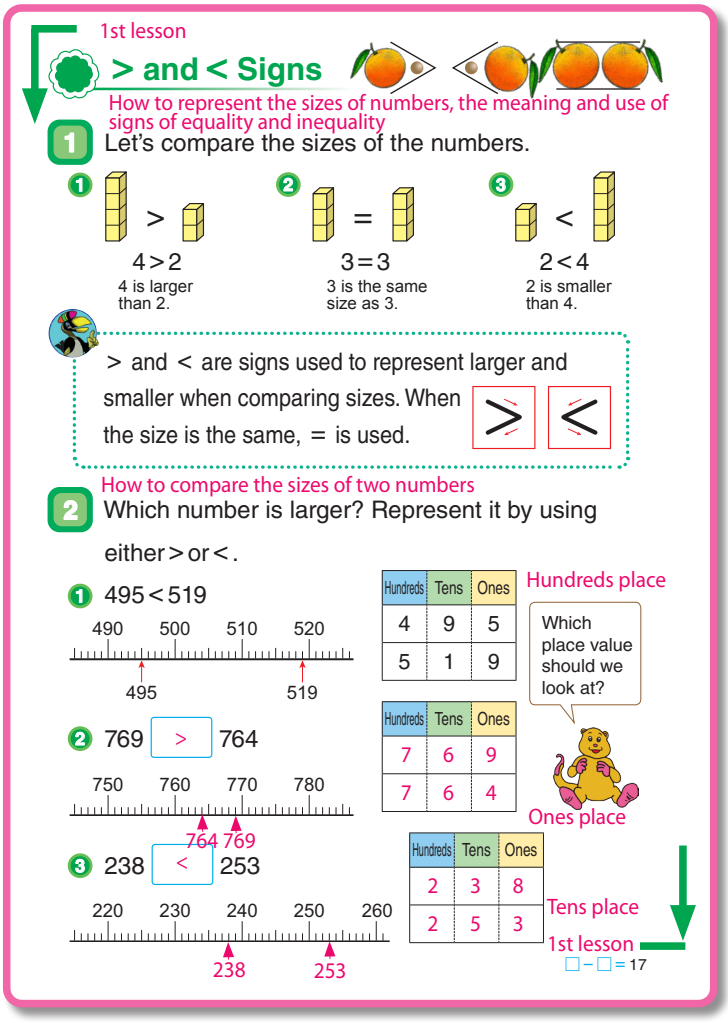
1. First check if one number has more hundreds than the other.

For example, 652 < 701, because 701 has more hundreds than 652.

2. If the numbers have the same amount of hundreds, then check the tens.

For example, 652 > 639 because though both have six hundreds, 652 has more tens than 639.

3. If the numbers have the same amount of hundreds and the same amount of tens, then look at the ones. For example, 652 < 655 because though both have six hundreds and five tens, 655 has more ones.



Lesson Flow

INTRODUCTION

1 Review.

T/P Review key ideas from the previous lesson.

BODY

2 Introduce the main task.

T Introduce and explain the main task 'Let's compare the sizes of numbers.'

3 ① Compare the sizes of the given three digit numbers.

T Explain to pupils that the signs > and < can be used to show which number is larger than the other, and also that the sign = indicates two numbers are the same in size.

P Complete activity ①, ② and ③.

TN Teacher checks with pupils the positions of the given two numbers on the number line.
Teacher can advise pupils to use a place value chart and think which numbers in which place in the chart they should look at in comparing the numbers.

4 Important Point

T/P Read and discuss the important point in .

5 ② Represent which number is larger than the other in math expressions by using > or <.

T Let's write math expressions that show which number is larger by comparing two numbers.

TN Teacher explains to pupils how to read math expressions with the signs of inequality. Pupils come to understand the expressions should be read from left to right.
① 495 is smaller than 519.
② 769 is larger than 764.
③ 238 is smaller than 253.

TN The term "a sign of inequality" will be introduced in the 3rd grade.

CONCLUSION

6 Summary.

T/P Summarise the lesson by confirming pupils' understanding of the main ideas in the lesson.

Sample Blackboard Plan

Date: **Chapter 1**: Numbers up to 1000 **Sub-chapter 2:** > and < signs **Lesson** 1 of 1

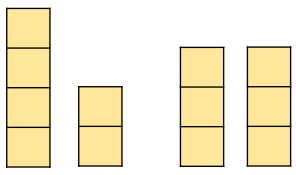
Main Task: Let's compare the sizes of the numbers.

Review

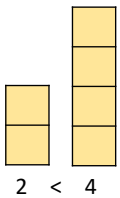
- Representing 3-digit numbers on a number line

Activity

1



4 > 2 3 = 3



2 < 4

When we read, read it from left to right.
(e.g.) 4 is larger than 2.

2

	Hundreds place	Tens place	Ones Place	
①	4	9	5	Compare the numbers in the hundreds place. 459 < 519
	5	1	9	
②	7	6	9	Compare the numbers in the tens place. 769 > 764
	7	6	4	
③	2	3	8	Compare the numbers in the tens place. 238 < 253
	2	5	3	

Summary

When we compare the sizes of numbers, we look first at the number in the largest place value and continue onto the next place values.

Unit 1

Unit: Numbers up to 1000
Sub-unit: 3. Addition and Subtraction
Lesson 1 of 2

Textbook Page : p.18
Actual Lesson 009

Sub-unit Objective

- To recognise numbers by 10s and understand how to calculate addition and subtraction.

Lesson Objective

- To recognise numbers by 10s and calculate addition and subtraction.

Prior Knowledge

- Number Line.
- Addition and subtraction.
- Money.

Preparation

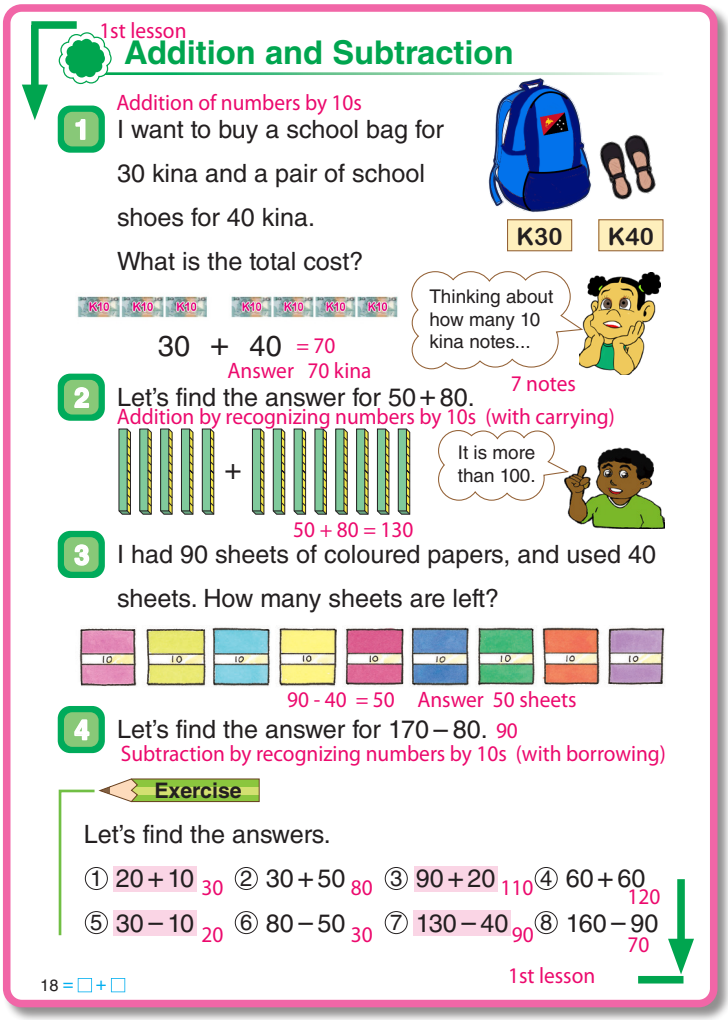
- Mathematics blocks, sample paper money notes. (for teacher's demonstration and for pupils' use)

Assessment

- Add and subtract numbers by 10s. F
- Add money problems by 10s. F S

Teacher's Notes

When solving 30 + 40, pupils can use 10 kina notes having them correspond with the given expression 30 + 40. This enables pupils to focus on the numbers in the tens place, which helps them solve the problem more easily. In this way, pupils should be able to tell there are 7 sets of 10 by adding 3 and 4, and get the answer 70 without difficulty.
Similarly, in solving the problem 90 − 40, pupils should have the number of paper bundles correspond with the given expression 90 − 40, and solve the problem by focusing on the numbers in the tens place and simply subtracting 4 from 9 to get the answer 50.
This is applicable also to solving addition and subtraction such as 5000 ± 3000 and 0.5 ± 0.3, where pupils can recognise the expressions simply as 5 ± 3 as a result of looking at the numbers simply by 1000s or 0.1s. Recognising numbers by units such as 10s, 100s, 1000s and 0.1s is an important and practical concept which can lead to the learning in the upper grades. Therefore, it should be acquired well by pupils at this stage.



Lesson Flow

INTRODUCTION

1 Review.

T/P Review key ideas from the previous lesson.

BODY

2 Introduce the main task.

T Introduce and explain the main task "How can we recognise numbers by 10 for easier calculation?"

3 1 Explain how to solve the problem.

T How much is it in total?

TN Teacher instructs pupils to use the sample 10 kina notes and has them count the notes by making sets of 10 to find out the total price.

P 30 is 3 sets of 10 and 40 is 4 sets of 10. Therefore, by adding 3 and 4, there are 7 sets of 10 which gives 70.

4 2 Write a math expression and find the answer.

TN In the same way as they did with the Problem 1, pupils count the number by making sets of 10 and find the answer.

P 50 is 5 sets of 10 and 80 is 8 sets of 10. Therefore, by adding 5 and 8, there are 13 sets of 10 which gives 130.

5 Write math expressions and find the answers.

TN When we count by making sets of 10, we get 5 sets of sheets as a result of 9 – 4. 5 sets of 10 is 50 sheets.
Teacher has pupils solve both Problems 3 and 4 by making sets of 10.

6 Exercise

P Do the exercise

CONCLUSION

7 Summary.

T/P Summarise the lesson by confirming pupils' understanding of the main ideas in the lesson.

Sample Blackboard Plan

Date: **Chapter 1**: Numbers up to 1000 **Sub-chapter 3:** Addition and Subtraction **Lesson** 1 of 2

Main Task: How can we recognise numbers by 10 for easier calculation?

Review

Use inequality signs to compare 358 and 381
358 < 381

Activity

1 30 + 40
There are 3 and 4 ten toes coins, making the total of 7 ten toea coins.
7 ten toea coins means 70 toea.
30 + 40 = 70 Answer 70 toea

2 50 + 80
There are 5 and 8 ten kina notes, making a total of 13 ten kina notes.
13 ten kina notes means 130 kina.
50 + 80 = 130 Answer 130 kina

3 90 – 40
We have 9 sets of 10 papers. When we take 4 sets from the original 9 sets, 5 sets remain.
90 – 40 = 50 Answer 50 papers

4 170 – 80
We have 17 ten kina notes. When we take 8 notes from the 17. 9 notes remain.
170 – 80 = 90

Summary

(decade number) + (decade number)
(decade number) – (decade number)

We can make sets of 10 to simplify the calculation.

Unit 1

Unit: Numbers up to 1000
Sub-unit: 3. Addition and Subtraction
Lesson 2 of 2

Textbook Page : p.19~20
Actual Lesson 010

Lesson Objective

- To find three digit set numbers as well as (three digit) ordinal numbers in the pupils' environment.

Prior Knowledge

- Large numbers.
- Place value.

Preparation

- Picture from p.19 and 20.

Assessment

- Identify three digit numbers in the environment. F S

Teacher's Notes

Numbers play an important role in our lives. Almost all the things we do involve numbers and Mathematics. Whether we like it or not, our life revolves in numbers since the day we were born. There are numerous numbers directly or indirectly connected to our lives.

Some uses of numbers in our daily life:

1. Seeing prices of items in the shops and market.
2. Seeing numbers on road signs.
3. Calling a member of a family or a friend using mobile phone.
4. Weighing fruits, vegetables, meat, chicken, and others in market.
5. Looking at the price of discounted items in a shopping mall.
6. Switching the channels of your favourite TV shows.
7. Telling time, you spent on work or school.

2nd lesson

Finding Numbers

Let's find numbers in your everyday life.

Three digit numbers in our lives and their uses (ordinal numbers and set numbers)



There are lots of different numbers in our town.



Let's find them.

At Manus market, there are prices.





There are numbers for each runner.





□ − □ = 19





Madang flight number is PX 7112.





Each box contains 36 packets of noodles.



The flight number is a number that indicates names of the airplanes.

The 36 packets is a number for quantity.



Numbers representing the order, Numbers representing the amount

How can we describe the different uses of numbers?

Let's make a poster to show what you found.



Do the prices of Manus items mean their order, or their quantity?



20 = □ + □

2nd lesson

Lesson Flow

INTRODUCTION

1 Review.

T/P Review key ideas from the previous lesson.

BODY

2 Introduce the main task.

T Introduce and explain the main task 'Let's find three digit numbers in our environment'.

3 Find numbers around us.

T We can see various numbers in the pictures on p.19 and 20. What are those numbers for?

P Numbers on price tags.

P Athletes tag numbers.

P Departure and arrival times.

TN Teacher tells pupils to look for three digit numbers around themselves, except for the ones appearing in the textbook, and discuss in groups.

P Vehicle registration numbers.

P 500 ml soft drinks.

4 Categorise various numbers according to their uses.

T What do these numbers indicate? Some indicate sizes or height. Others indicate order or names of something.

P The number on a carton or box indicates an amount of quantity.

P The flight number indicates the names of the airplanes.

P Price means the amount of money. Price tells us if an item is expensive or cheap.

5 Group the numbers and make a poster compiling the results.

TN Through an activity of grouping numbers into two categories, pupils come to understand the uses of the numbers.

TN Teacher advises pupils to categorise numbers into two groups, that is (1) numbers representing the amount, and (2) numbers representing the order or position.

6 Exercise.

P Do the exercise.

CONCLUSION

7 Summary.

T/P Summarise the lesson by confirming pupils' understanding of the main ideas in the lesson.

Sample Blackboard Plan

Date: **Chapter 1**: Numbers up to 1000 **Sub-chapter 4: Finding Numbers** **Lesson** 2 of 2

Main Task: **Let's look for three digit numbers in our environment.**

Review

We can make sets of 10 to simplify the calculation.

Activity

Finding Numbers

Let's find numbers in your everyday life



Price tags



Locker combinations

572

Manus leg band K800
Manus basket K100

Athlete
Bib number 431, 262,

431

Summary

There are many numbers that can be found in our daily lives.

Each number has its own use.

Unit 1

Unit: Numbers up to 1000
Exercise
Lesson 1 of 1

Textbook Page : p.21
Actual Lesson 011

Sub-unit Objective

- To review and understand what was learnt in this unit.

Lesson Objective

- To review what have been learnt.

Prior Knowledge

- What has been learnt in this unit
- Composition of number 1000.

Preparation

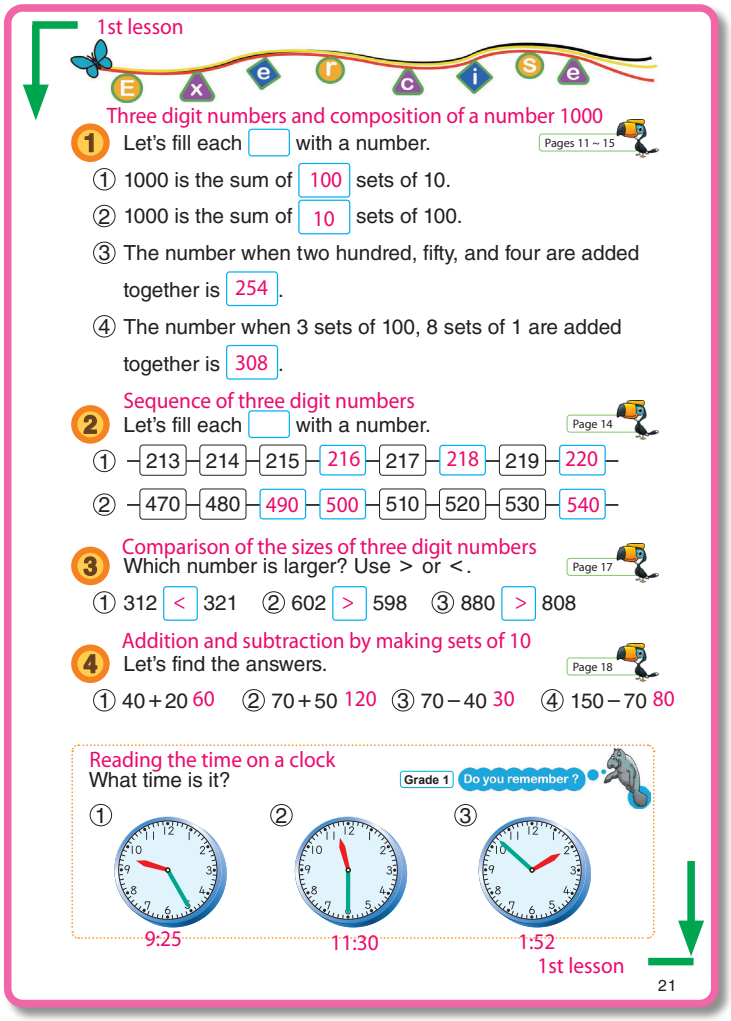
- Picture from p.19 and 20.

Assessment

- Review content learnt in this unit on size and composition of a number 1000. F S

Teachers Notes

These exercises help pupils to summarise the unit of Numbers up to 1000 focussing on composition of numbers up to 1000, comparison of numbers and addition and subtraction of numbers in sets of 10.
The teacher may help those who have difficulties with supplementary exercise which the teacher can develop.


1st lesson

Exercise

Three digit numbers and composition of a number 1000

1 Let's fill each ☐ with a number. Pages 11 ~ 15

① 1000 is the sum of 100 sets of 10.

② 1000 is the sum of 10 sets of 100.

③ The number when two hundred, fifty, and four are added together is 254.

④ The number when 3 sets of 100, 8 sets of 1 are added together is 308.

Sequence of three digit numbers

2 Let's fill each ☐ with a number. Page 14

① 213 214 215 216 217 218 219 220

② 470 480 490 500 510 520 530 540

Comparison of the sizes of three digit numbers

3 Which number is larger? Use > or <. Page 17

① 312 < 321 ② 602 > 598 ③ 880 > 808

Addition and subtraction by making sets of 10

4 Let's find the answers. Page 18

① 40 + 20 60 ② 70 + 50 120 ③ 70 − 40 30 ④ 150 − 70 80

Reading the time on a clock

What time is it? Grade 1 Do you remember ?

① 9:25 ② 11:30 ③ 1:52

1st lesson

21

Lesson Flow

EXERCISE

Pupils review unit lessons on composition of number 1000.

1. Pupils understand the composition of a number 1000.

TN This is a question for assessing whether pupils properly understand the size and composition of a number 1000.

TN For pupils who have difficulty understanding the problem, Teacher advises them to use mathematics blocks, model coins or a place value charts to visualise the size and composition of a number 1000.

2. Pupils understand the sequence of three digit numbers.
This is a question for assessing whether pupils properly understand the sequence of three digit numbers. For pupils who have difficulty understanding the problem, Teacher tells them to review p.16 and find out the numbers lining up in a sequential order and how the numbers increase. Pupils come to realise that the numbers in the problem ① increase by 1s and those in the problem ② increase by 10s

3. Pupils compare the sizes of three digit numbers.
This is a question for assessing whether pupils can compare the sizes of three digit numbers. For pupils who have difficulty understanding the problem, Teacher tells them to review p.17 and remember they should look at the value in the hundreds place first, then the tens place and ones place. Also, pupils can use a place value chart or mathematics blocks to actually visualise the number and compare the sizes

4. Pupils calculate addition and subtraction by making sets of 10.

TN This is a question for assessing whether pupils can properly calculate addition and subtraction. For pupils who have difficulty understanding the problem, Teacher tells them to review p.20 and get them to actually manipulate concrete objects such as mathematics blocks or model coins to visualise the given addition and subtraction problems.

Do you remember?

P Pupils practice reading the time on a clock.

Sample Blackboard Plan

Date: **Chapter 1**: Numbers up to 1000 **Exercise** **Lesson** 1of 1

1 Let's fill each ☐ with a number. Pages 11 ~ 15

① 1000 is the sum of 100 sets of 10.
② 1000 is the sum of 10 sets of 100.
③ The number when two hundred, fifty, and four are added together is 650.
④ The number when 3 sets of 100, 8 sets of 1 are added together is 308.

2 Let's fill each ☐ with a number. Page 14

① 213 214 215 216 217 218 219 220 Increased by 1s
② 470 480 490 500 510 520 530 540 Increased by 10s

3 Which number is larger? Use > or <. Page 17

① 312 < 321 ② 602 > 598 ③ 880 > 808

4 Let's find the answers.

① 40 +20 Answer: 60

② 70 + 50 Answer: 120

③ 70−40 Answer：30

④ 150 − 70 Answer: 80

What time is it? Grade 1 Do you remember?

① 9:25 ② 11:30 ③ 1:52

Unit 1

Unit: Numbers up to 1000
Problems 1 and 2
Lesson 1 of 1

Textbook Page : p.22~23
Actual Lesson 012

Sub-unit Objective

- To review and understand the concepts learnt in this unit.

Lesson Objectives

- To review what have been learnt.
- To understand the context of given problems and apply what have been learnt from the previous lessons.

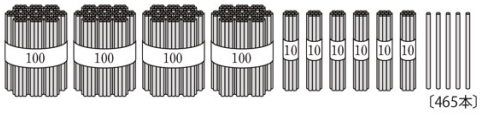
Prior Knowledge

- What has been learnt in this unit.

Preparation

- Model coins for pupils and teacher's demonstration
- Supplementary Problems (Students can work on these problem if time allows):

1. How many pencils are there?



〔465本〕

2. Let's fill each □ with a number.
① 930 is a sum of □ sets of 100 and 3 sets of □.
② The number that is the sum of 68 sets of 10 is □.
③ The numbers that is □ larger than 900 is 1000.
3. Let's show which number is larger than the other by using the signs > and <.

Assessment

- Interpret the word problems in mathematical expressions and solve it accordingly.

Teacher's Notes

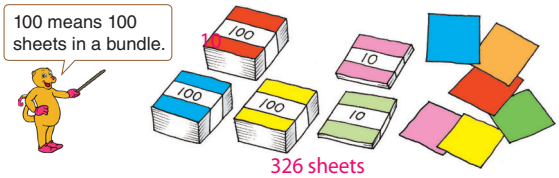
Problem 1 can be given to pupils as homework and checked quickly during the lesson while Problem 2 can be done during the lesson for pupils' problem-solving practices. 1 and 2 should be done within one period.

1st lesson

Problems 1

1 How to read and write three digit numbers
How many sheets of coloured paper are there?

100 means 100 sheets in a bundle.

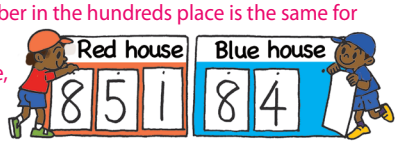


326 sheets

2 Composition of three digit numbers
Let's look at 480.
① 4 in the hundreds place means that 4 is the value of 400.
② 480 is the sum of 48 sets of 10.
③ The number that is 20 more than 480 is 500.

3 Comparison of the sizes of three digit numbers
Which number is larger? Let's use > or <.
① 523 < 532 ② 803 > 796 ③ 420 > 402

4 How to compare the sizes of three digit numbers
The number in the ones place of the blue team's points is to be placed.
Taki says that the red team has won. Why does he say so? The number in the hundreds place is the same for both.
When we compare the numbers in the tens place, the red team's number is larger.



Problems 2

1 Yamo is shopping.

In my purse, I have 5 notes which are either 10 kina or 2 kina.

① How much does Yamo have? Following the examples, write the possible numbers of, 10 kina notes and 2 kina notes, and the sum of money.

'Sum' means 'Total'

Number of 10 kina notes	1	2	3	4
Number of 2 kina notes	4	3	2	1
Sum of money	18	26	34	42

Phrase
"If …, then … ."
If the number of 10 kina notes is 1, then the number of 2 kina notes is 4.

If the number of 10 kina notes is 3, then...

② Yamo bought a pair of shoes for 25 kina and received change.
Let's discuss which notes she used, and what she received as change.
She paid with 3 notes of 10 kina, and received a change of 5 kina. She paid with 2 notes of 10 kina and 3 notes of 2 kina and received a change of 1 kina.

1st lesson

Lesson Flow

PROBLEMS 1

1 Pupils understand the given problem and answer the problem accurately.

TN Teacher assesses pupils' understanding of the number compositions of three digit numbers.

TN For pupils who have difficulty understanding the problem, Teacher advises them to use mathematics blocks, model coins or a place value charts to visualise the size and compositions of the numbers.

2 Pupils are assessed here whether they have properly understood the number compositions of three digit numbers

3 Pupils are assessed here whether they can accurately compare the sizes of three digit numbers.

4 Through an activity of presenting one's reason in identifying a larger number, pupils are assessed whether they properly understand the problem and a way of comparing the sizes of two numbers.

PROBLEMS 2

1 Pupils think of all possible answers under the given situations or condition, and explain the answers in words or show the answers in charts.

T ① How much does Yamo have? Let's use our model notes to see what combinations of the numbers of K10 and K2 notes we can think of. Write down your answers in the chart. You can add your K10 notes one by one when thinking.

TN Teacher introduces a phrase "If …, then…" and advises pupils to think in mind using this phrase while they try to identify possible combinations and fill in the chart.

Number of 10 kina notes	1	2	3	4
Number of 2 kina notes	4	3	2	1
Sum of money	18	26	34	42

T ② Yamo bought a K40 school bag and received change. Now, how much notes does she have in her purse?

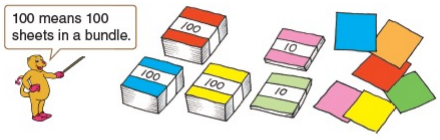
- She used a K100 note to buy a bag that cost K40 so she received a change of K60.
  K100 − K40 = K60
  So, the remaining notes are one K100 note which she did not use, one K50 note and K10 note which she received as change, and not forgetting five K10 notes that she had in the beginning, making it 8 notes altogether.
- Pupils should present their answers by actually operating their model notes.

Sample Blackboard Plan

Date: **Chapter 1**: Numbers up to 1000 **Problems 1 and 2** **Lesson** 1of 1

Problems 1

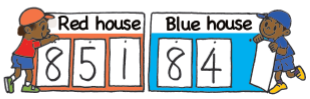
1 How many sheets of coloured paper are there?



2 Let's look at 480.
① 4 in the hundreds place means that 4 is the value of ☐.
② 480 is the sum of ☐ sets of 10.
③ The number that is 20 more than 480 is ☐.

3 Which number is larger? Let's use > or <.
① 523 ☐ 532 ② 803 ☐ 796 ③ 420 ☐ 402

4 The number in the ones place of the blue team's points is ☐ to be placed.
Taki says that the red team has won. Why does he say so?



Problems 2

1 Yamo is shopping.

In my purse, there are two 100 kina notes, and I also have 5 notes which are either 10 kina or 2 kina.

① How much does Yamo have? Following the examples, write the possible numbers of, 10 kina notes and 2 kina notes, and the sum of money.

'Sum' means 'Total'

Number of 10 kina notes	1	2		
Number of 2 kina notes	4	3		
Sum of money	18	26		

Phrase
"If …, then … ."
If the number of 10 kina notes is 1, then the number of 2 kina notes is 4.

If the number of 10 kina notes is 3, then ...

② Yamo bought a pair of shoes for 40 kina and received change.
Let's discuss which notes she used, and what she received as change.

End of Chapter Test: Chapter 1 **Date:**

Evaluation: Chapter 1 Numbers up to 1000	Name:	Score /100

[10 points for each question]

1. Find the answers.

(1) What number is in the hundreds place in 350? _____

(2) What number is in the tens place in 640? _____

(3) How many tens are needed to make 260? _____

2. Please write the numbers in numeral.

(1) Three hundred forty two _____

(2) Six hundred and five _____

3. Fill in the blank.

(1) 700 − 800 − 900 − ☐

(2) 401 − 400 − ☐ − 398

4. Let's calculate.

(1) 30 + 70 (2) 150 − 60 (3) 200 + 400

Chapter 2 Thinking about How to Calculate

1. Unit Objectives

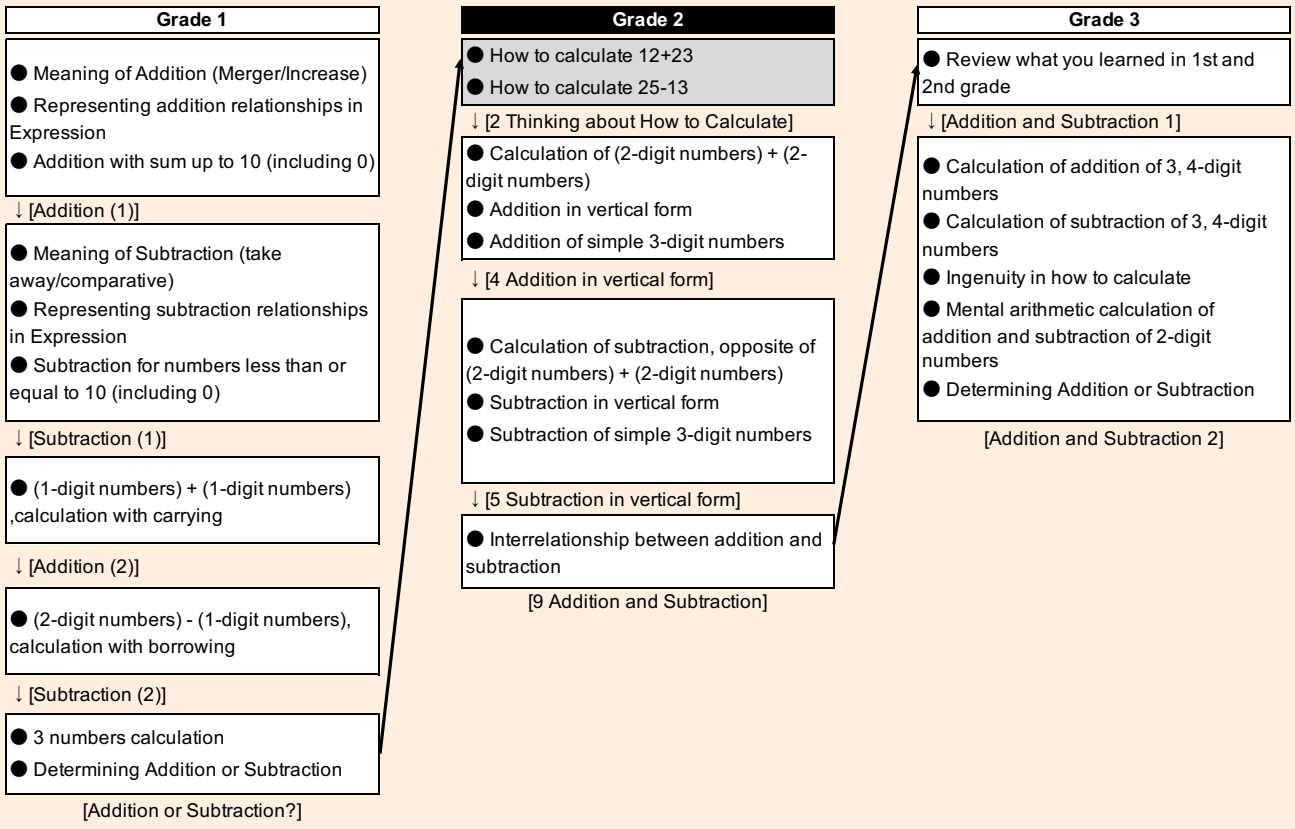
- To make math expressions of the presented concrete situations using (two digit number) + (two digit number) and (two digit number) – (two digit number),
- To think about how to calculate the expressions using the prior knowledge.

2. Teaching Overview

In grade 1, pupils learned how to add and subtract first-digit numbers, and in the previous unit, 'Numbers up to 1000', they learned calculations such as "20 + 10" and "30 – 20".
The aim of this unit is to think about how to calculate "12 + 23" and "25 – 13" based on what they have already learned. To do this, let the pupils think about how to find the answer by replacing the "cookies" in the textbook with counters or by manipulating the blocks.
Teacher creates opportunities that pupils can express their ideas and discuss with their friends. It is important to accept all pupils' ideas without deciding which method is better.
Teacher makes pupils aware of the advantages of expressing them in a group of 10 and aligning their place by understanding the ideas of friends, focusing on the commonalities and differences with their own thoughts. Even with new calculations, teacher value their experience of being able to solve them using what they have already learned, and to develop their ability to think.

Key Concepts: How to calculate addition and subtraction.

3. Related Learning Contents



Unit 2

Unit: Thinking about How to Calculate
Sub-unit: 1. Addition
Lesson: 1 of 1

Textbook Page : p.24~26
Actual Lesson 013

Sub-unit Objective
- Addition of (2-digit) + (2-digit) without carrying.

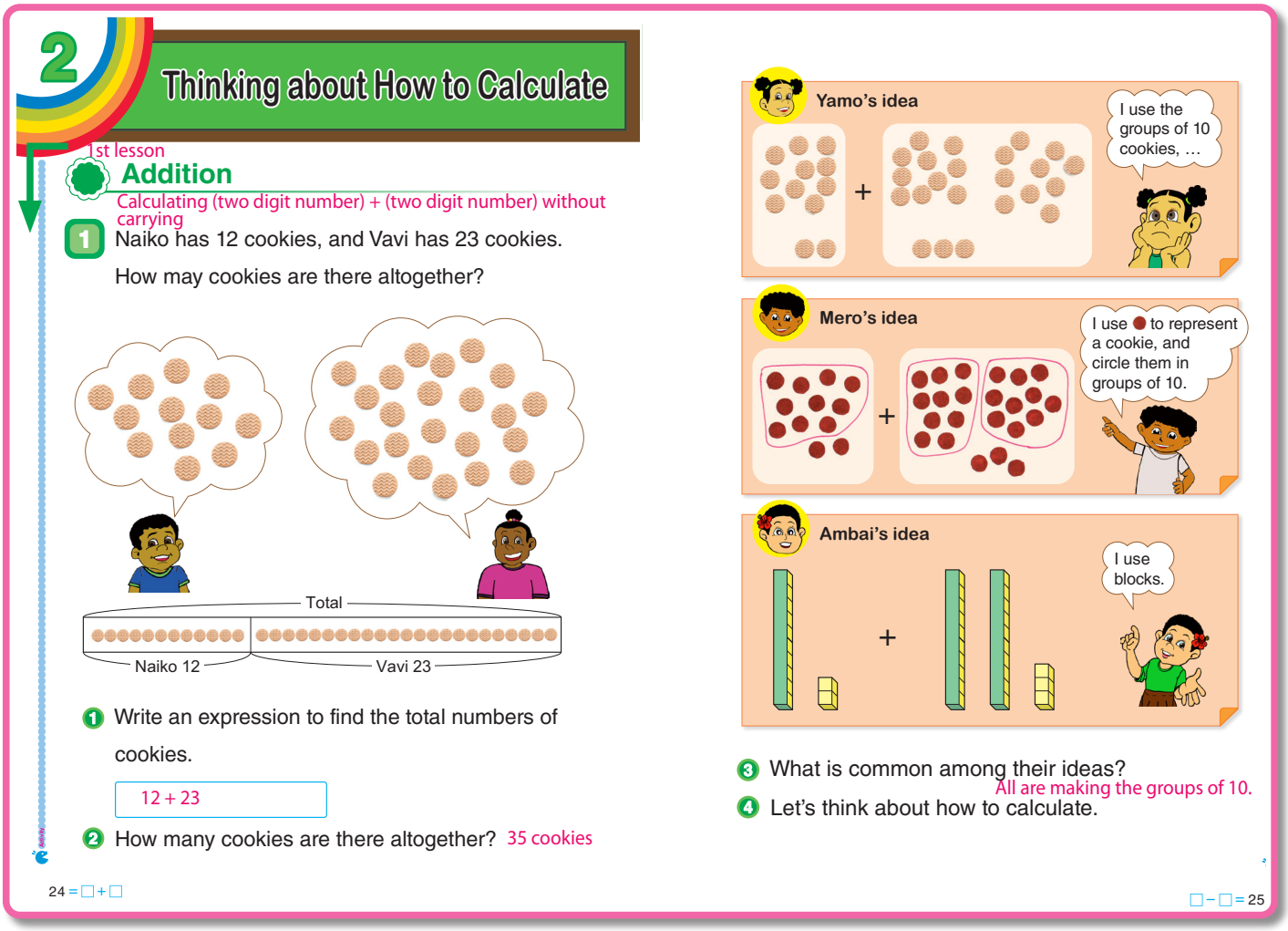
Lesson Objective
- To make math expressions of the presented concrete situations using (two-digit number) + (two-digit number) and (two-digit number) − (two-digit number), and to think how to calculate the expressions.

Prior Knowledge
- Numbers larger than 10 (Grade 1 unit 7).
- Large numbers (Grade 1 unit 14).

Preparation
- Pictures of cookies, long tape for posting, mathematics blocks. (for teacher's demonstration and pupils)

Assessment
- Make math expressions of (two-digit number) + (two-digit number) from situations given. F S
- Calculate expressions of (two-digit number) + (two-digit number). F S

Teacher's Notes
Teaching Tips: Understanding situations and making math expressions accordingly.
Make pupils realise that common process taken in all the ideas is that numbers are seen as sets of 10 and singles and that the value in the tens and the value in the ones place are calculated separately.



Lesson Flow

INTRODUCTION

1 Review.

T/P Review key ideas from the previous lesson.

BODY

2 Introduce the main task.

T Introduce and explain the main task 'Let's think of a math expression to find the total number of cookies.'

3 1 Read and understand the word problem.

T/P Read and understand the task.

P Discuss their thinking with class.

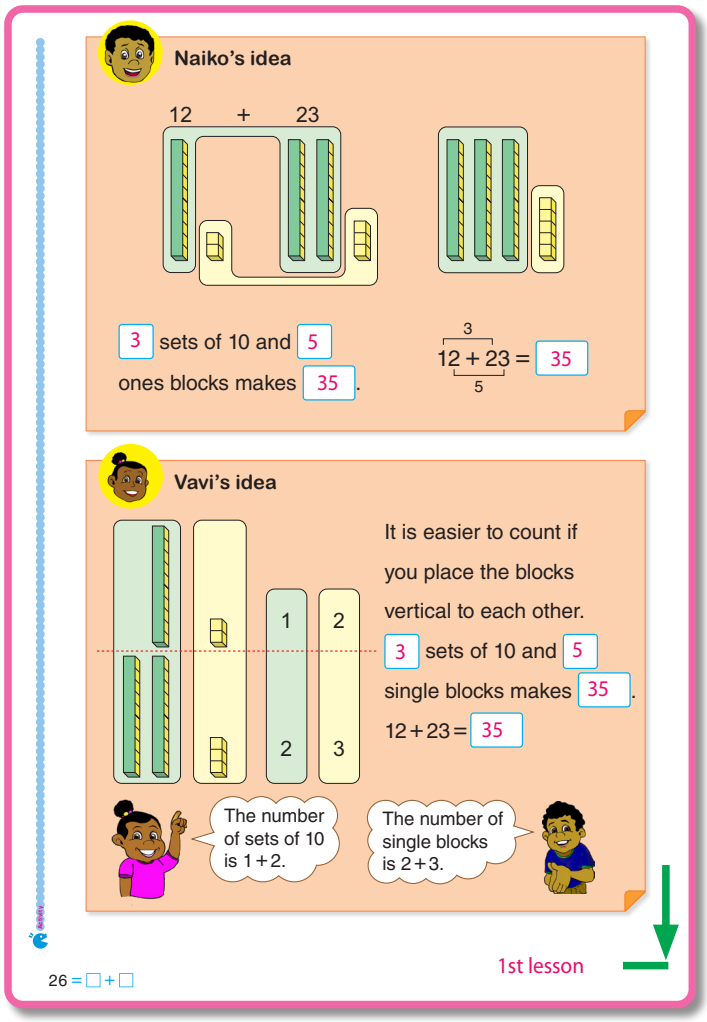
TN Guides the discussion and leads them into the next activity.

T 1 Let's think of a math expression to find the total number of cookies.

TN Draw pupils' attention to the word "total". By representing the pictures of cookies on a tape diagram pasted on the blackboard (see p.24).

P Make a math expression: 12 + 23.

4 Think about how many cookies are there altogether.



T 2 How many cookies are there altogether?

P Think and discuss in groups about the difference between the additions they are calculating this time and the additions in the previous lessons.

T How many cookies are there altogether? Think about how to solve the problem 12 + 23 and try it on your own.

TN Tell pupils to bring out their marbles and mathematics blocks so that they can use them during the activity when they want to.

T/P Guide the group presentation of ideas and make connections to the ideas that are expressed with each other.

T Encourage pupils to present to the class what their group's answer for calculating 12 + 23.

P Present their ideas of calculating to the class.

T/P Ask pupils to turn to Textbook page 25 and identify whether there are any ideas introduced in the textbook that are similar to their own ideas.

T 3 Can you notice anything common among the ideas here?

TN Let pupils to realise that common process in all the ideas is that numbers are seen as sets of 10 and singles, and that the value in the tens and the ones place are calculated separately.

P Discuss anything common among the various ideas.

T 4 How can we calculate 12 + 23 easier?

P Think and discuss in groups or individually about how to calculate 12 + 23.

T Let's try to explain how to calculate 12 + 23 by using the blocks on page 26.

P Explain how to calculate 12 + 23 easily using Naiko's and Vavi's ideas.

CONCLUSION

5 Summary.

T/P Summarise the lesson by confirming pupils' understanding of the main ideas in the lesson.

Due to space limitations, the Teacher's Notes and Sample BlackBoard Plan are placed on page 32.

Unit 2

Unit: Thinking about How to Calculate
Sub-unit: 2. Subtraction
Lesson 1 of 1

Textbook Page : p.27~29
Actual Lesson 014

Sub-unit Objective

- Subtraction of (2-digit) – (2-digit) without borrowing.

Lesson Objective

- To make math expressions of the presented concrete situations using (two-digit number) – (two-digit number) and to think how to calculate the expressions.

Prior Knowledge

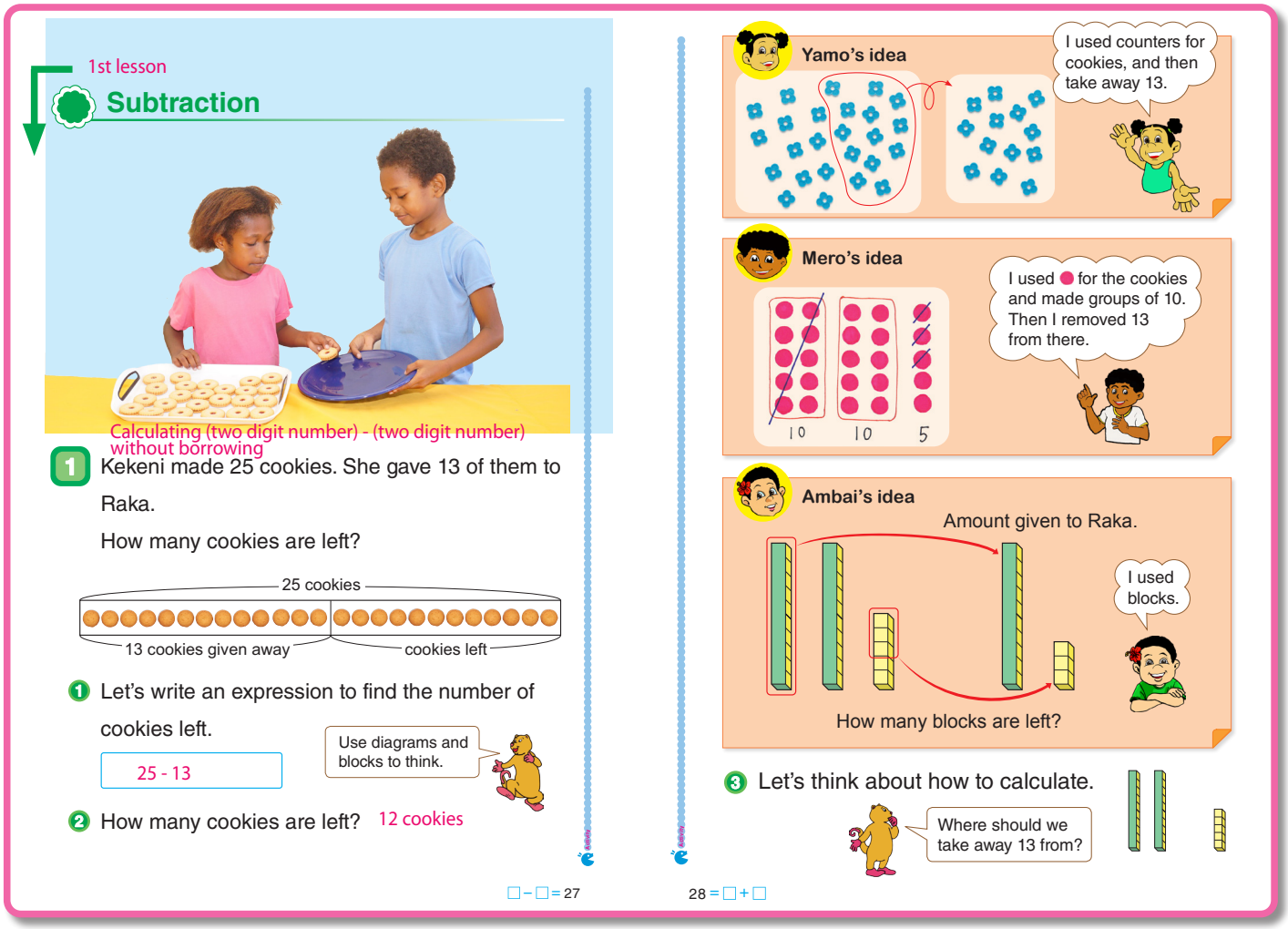
- Recognise, read and write numbers 1 to 10.

Preparation

- Pictures of cookies, long tape for posting, mathematics blocks. (for teacher's demonstration and pupils)

Assessment

- Make math expressions of (two-digit number) – (two-digit number) from situations given. F S
- Calculate expressions of (two-digit number) – (two-digit number). F S



Lesson Flow

INTRODUCTION

1 Review.

T/P Review key ideas from the previous lesson.

BODY

2 Introduce the main task.

T Introduce and explain the main task "Let's think of ways to calculate 25 – 13".

3 ① Read and understand the situation.

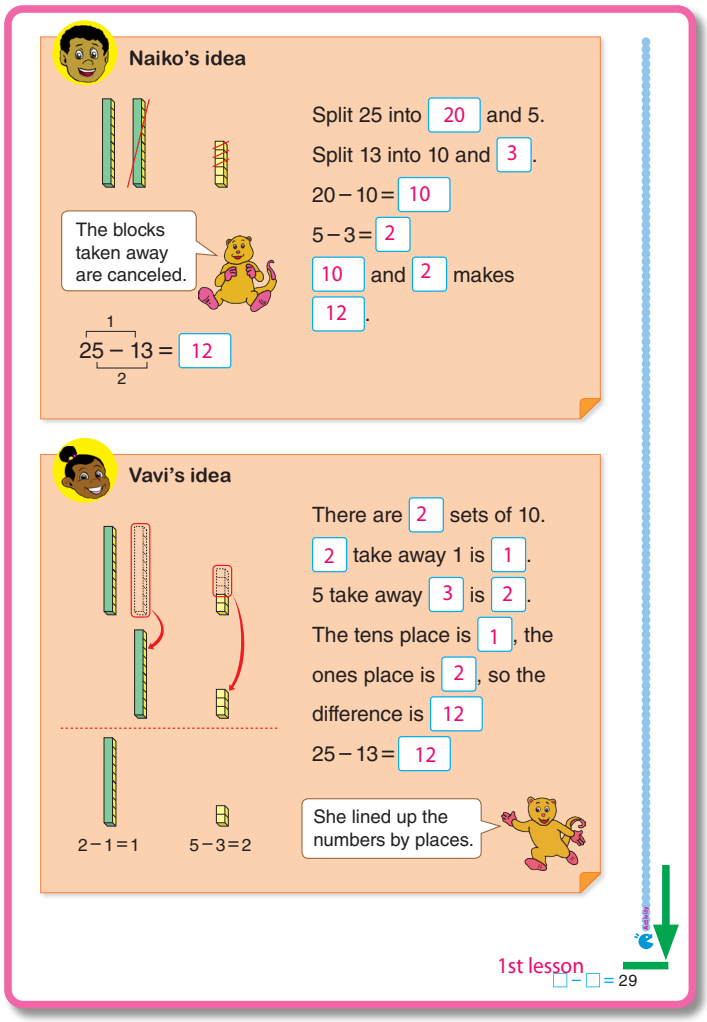
T/P Let's read and understand the given situation.

T ① Let's think of a math expression to find the number of remaining cookies.

TN Advises pupils to pay attention to the phrase "She gave..." and "...are left". By representing the pictures of cookies on a tape diagram pasted on the blackboard. (see p.27)

P Think about the difference between the subtraction they are calculating this time and the subtractions in the previous lessons.

T Can you tell us anything different from the calculations we did in our previous lessons?



4 Think of how to calculate 25 – 13.

T ② How many cookies are left? Let's think how we can calculate 25 – 13 quicker and simple?

P Think on their own ways and solve the problem.

TN Tell pupils to prepare their mathematics blocks in case they would need them in solving the problem.

P Present their ideas and discuss with each other.

T What was your answer? Now you can present your own idea of how to calculate 25 – 13 using the mathematics blocks.

P Pupils present their ideas in the class using the blocks.

T Remind pupils to look at the 3 ideas and realise whether there are any ideas introduced in the textbook (ideas of Yamo, Mero and Ambai) similar to their own ideas and if there are any common ideas.

P Discuss if there is anything common among the ideas.

T Can you notice anything common among the ideas here?

T ③ How can we calculate 25 – 13 faster and easier?

TN Let the pupils explain their ideas using the blocks in accordance with the given math expression.

TN Draws pupils' attention to the difference between "Naiko's Idea" and "Vavi's Ide".

P Explain how to calculate 25 – 13 faster and easier.

CONCLUSION

5 Summary.

T/P Summarise the lesson by confirming pupils' understanding of the main ideas in the lesson.

Due to space limitations, the Sample Blackboard Plan is placed on page 33.

Unit 2 Unit: Thinking about How to Calculate

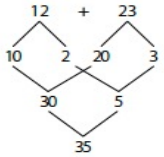
p.28: Sub-unit 1, L1

Teacher's Notes

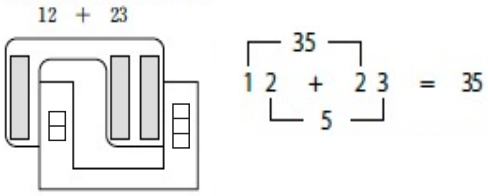
Teaching Tips: Mathematical Way of Representation

[Horizontally placing the blocks which represent augend and addend]

This way of placing the blocks horizontally is based on the ideas of composing and decomposing numbers. In this textbook, the expression 12 + 23 is described as follows.



Here, 12 is split into 10 and 2, and 23 is split into 20 and 3. Teacher is encouraged to bring this approach into regular lessons as much as possible and familiarise pupils with the use of it on a daily basis.



p.29: Sub-unit 1, L1

Sample Blackboard Plan

Date: **Chapter 2**: Thinking about How to Calculate **Sub-chapter 1:** Addition **Lesson** 1 of 1

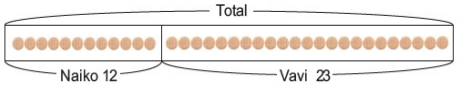
Main Task: "Let's think of a math expression to find the total number of cookies".

Review

Solve the mathematic expression
5 + 4
Answer: 5 + 4 = 9

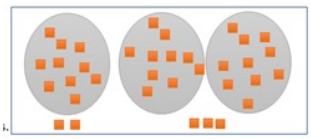
Activities

1. Naiko has 12 cookies , and Vavi has 23 cookies. How many cookies are there altogether?



1. Math expression 12 + 23

2. Sharing our ideas. Making sets of 10 and singles.



3. What is common among Yamo, Mero, and Ambai's ideas?

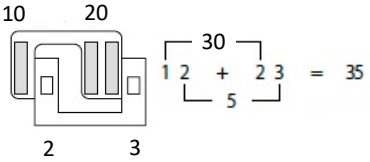
10 and 20 gives 30

2 and 3 gives 5

Then 30 and 5 gives 35 altogether

4. Let's think about how to calculate 12 + 23

By using the box



Summary

We make sets of 10 and find the value in the tens place as well as that in the ones place.

p.31: Sub-unit 2, L1

Sample Blackboard Plan

Date: **Chapter 2**: Thinking about How to Calculate **Sub-chapter 2:** Subtraction **Lesson** 1 of 1

Main Task: "Let's think of ways to calculate 25 – 13".

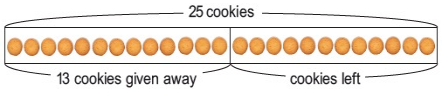
Review

Solve the mathematic expression 12 + 23

Answer: 12 + 23 = 35

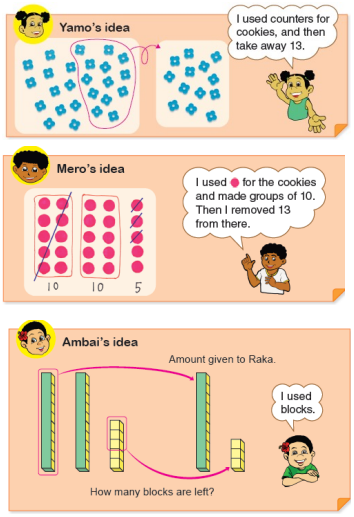
Activities

1 Kekeni made 25 cookies. She gave 13 of them to Raka. How many cookies are left?

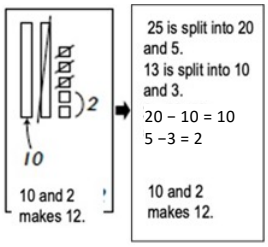


1 Math expression 25 – 13

2 How many cookies are left?



3 Let's think about how to calculate 25 – 13. By using the blocks.



Answer: 25 – 13 = 12

Summary

We make sets of 10 and find the value in the tens place as well as that in the ones place.

End of Chapter Test: Chapter 2 **Date:**

Evaluation: **Chapter 2** Thinking about How to Calculate	Name:	Score /100

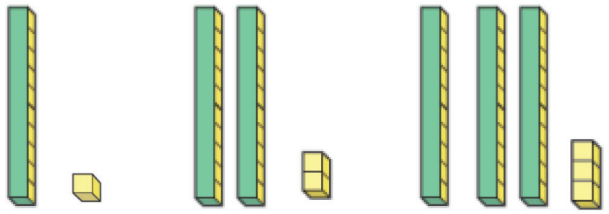
[10 points for each blank]

1. Fill in the blank.

David has 11 cookies, and Ana has 22 cookies. How may cookies are there altogether?

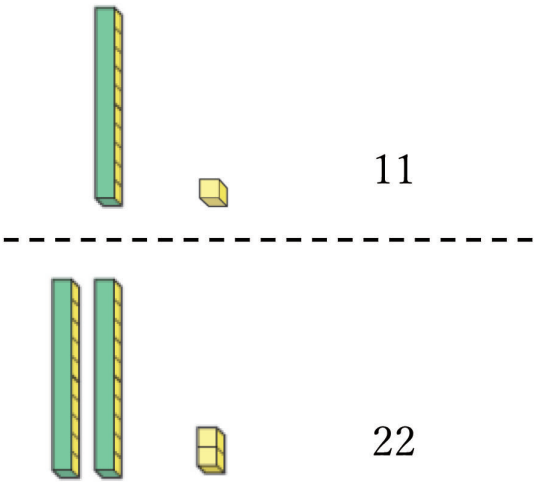
(1) Michelle's idea

11 + 22



_____sets of _____ and _____ones blocks makes_____ . 11 + 22 = _____

(2) Bob's idea



It is easier to count if you place the blocks vertical to each other.

_____sets of _____ and _____ single blocks makes _____.

11+22= _____

Chapter 3 Time and Duration

1. Unit Objectives

- To deepen the understanding of time and apply it.
- To come to understand various units such as days, hours and minutes and the relation between each.

2. Teaching Overview

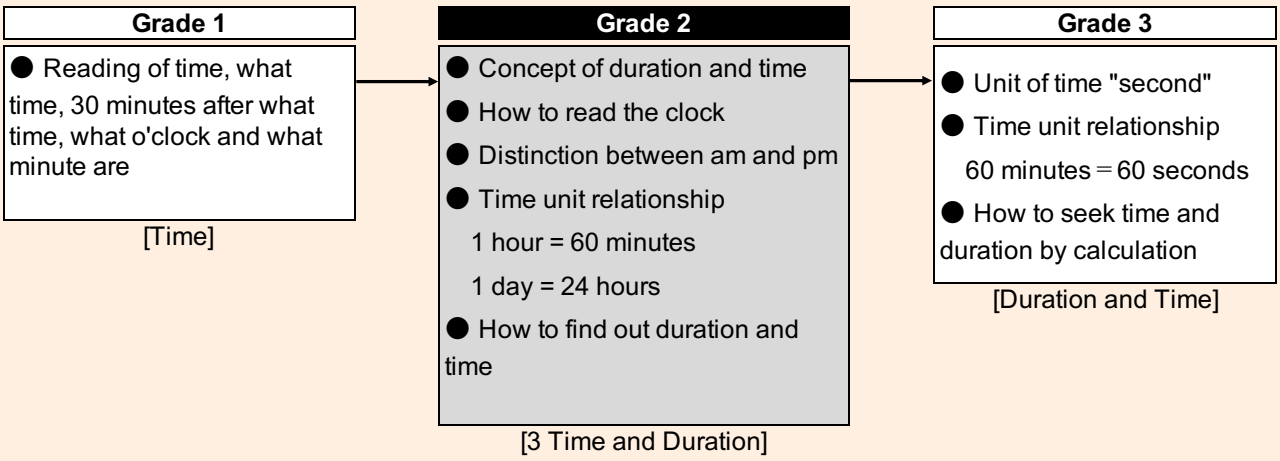
In grade 1, pupils have learned to read the time of minutes in various situations in their daily lives. In grade 2, pupils will continue to ensure that they can read the time, clarify the concept of time by grasping the passage of time in concrete situations, and distinguish between the use of “time” and “duration”. At present, digital clocks are more popular than analog clocks, so we also teach how to read digital clocks.

Time and Duration: Based on the scene of the hiking, pupils check whether the various times can be read correctly. After that, direct the pupils’ attention to the duration between the time of departure and the time of arrival, and have them understand “the duration for the long hand to move one scale forward = 1 minute”.
Also, help them understand that it takes 60 minutes for the long hand to make one revolution, and 60 minutes is one hour.

The Duration of One Day in Hours: As pupils examine a day in their daily life using the textbook’s figure, help them understand that a day consists of 12 hours in the morning and 12 hours in the afternoon, making a total of 24 hours. In addition, the meaning and usage of the words time and duration are learned correctly.

Key Concepts: Time and duration, hours, minutes, am, pm.

3. Related Learning Contents



Unit 3

Unit: Time and Duration
Sub unit: 1. Time and Duration
Lesson 1 of 1

Textbook Page : p.30~31
Actual Lesson 015

Sub-unit Objectives

- To understand the relation between the movement of long hands and times.
- To identify various times using the knowledge of the function of clocks.

Lesson Objectives

- To read the exact minutes of the clock.
- To learn that for the long hand, each mark is one minute, and that when it make one turn, it is 60 minutes, that is 1 hour.
- To read the time of the clock accurately based on this understanding.
- To recognise the difference between time and duration.

Prior Knowledge

- Grade 1 Chapter 8 (Time).
- Previous unit.

Preparation

- Model clock for demonstration, time ruler (8:50−10:10 AM), clocks with time, minute and second hands.

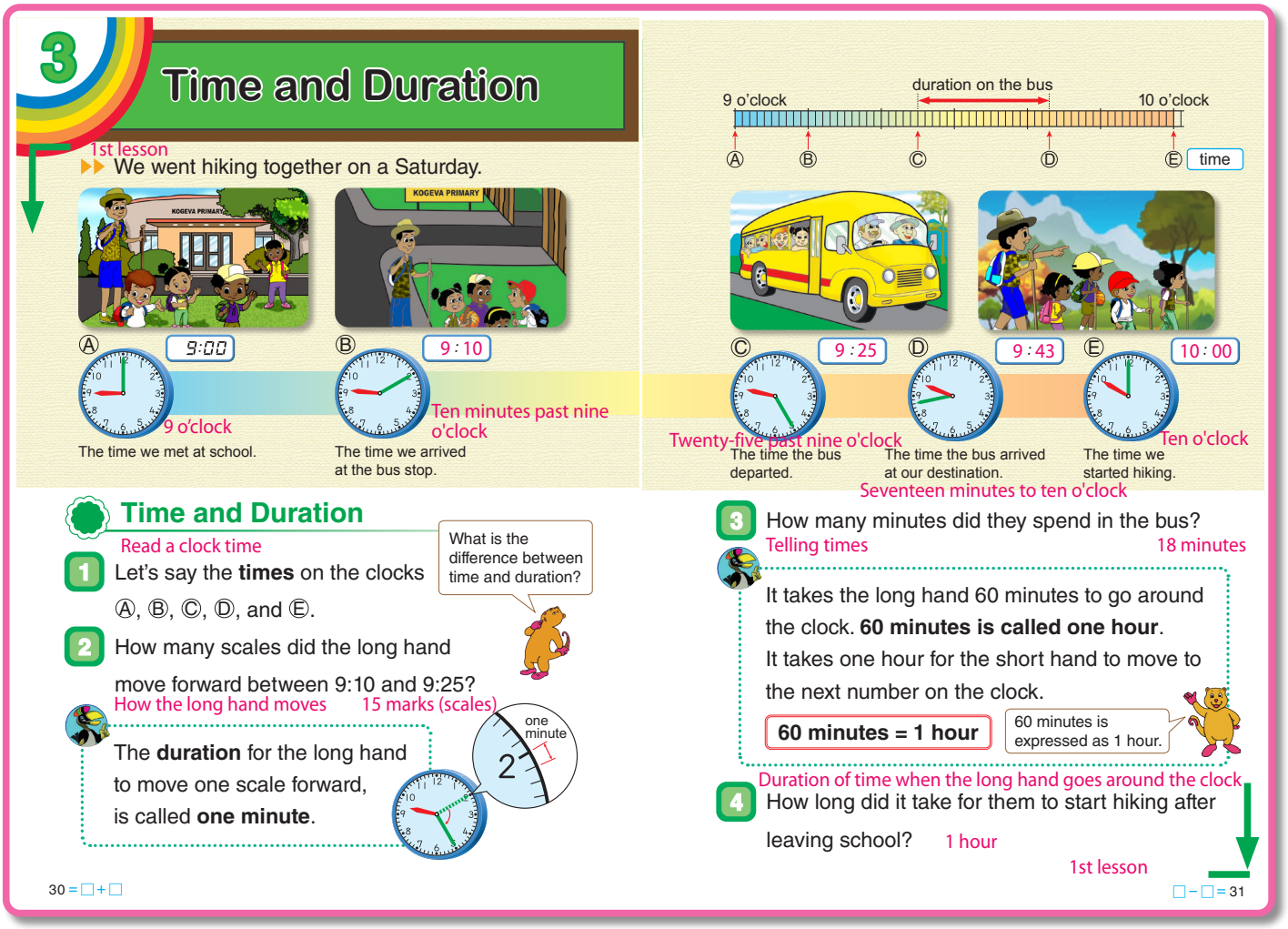
Assessment

- Read and tell time correctly. F S
- Confidently explain the difference between time and duration. F S

Teacher's Notes

There are 3 ways to find out the duration of time from the above-shown time Ⓒ, that is 9:25 to the time Ⓓ, that is 9:43.

1. By counting from 9:25 to 9:43, on the clock.
2. By adding in parts;
   (i) 9:25 to 9:30 (5minutes)
   (ii) 9:30 to 9:40 (10minutes)
   (iii) 9:40 to 9:43 (3minutes). 5+10+3=18
3. By calculating 43−25 to find 18.



Lesson Flow

INTRODUCTION

1 Pre-discussion.

T/P Observe a clockface and discuss the basic features of a clock-face and its uses.

BODY

2 Introduce the main task.

T Introduce and explain the main task 'Let's think of how to tell time and duration'.

3 ▶▶ Hiking

T/P Read and understand and discuss what the students are doing in the different pictures.

TN Base the discussion only on the scenario on page 30 and 31 and not to fill in the blanks as it will be done later.

4 1 Tell the times on the clocks Ⓐ, Ⓑ, Ⓒ, Ⓓ and Ⓔ.

T Put the enlarged pictures of clock faces on the blackboard with blank times.

T/P Discuss the times using the "duration on the bus" timeline on page 31 to tell the time and duration.

P Present their answers and fill in the boxes that look like a digital clock display.

5 2 Find how many marks the long hand moves during the time between Ⓑ and Ⓒ.

TN Teacher checks with pupils by moving the hands of the clock. (long hand moves 15 marks)

P Experience the length of one minute by observing the demonstration.

T Explain to pupils that when the long hand moves 15 marks, it is 15 minutes.

T/P Read and explain the important point .

6 3 Find out the duration of time.

T Tell pupils to find out how many marks the long hand passes from the time Ⓒ to the time Ⓓ.

P Read the time the bus departed and the time it arrived and tell the duration.

T/P Read and explain the important point .

7 4 Find out how many minutes it is from the time Ⓐ to the time Ⓓ.

T How long did it take for them to start hiking after leaving school?

P 60 minutes

TN Explain to pupils that the time the students left school is at is 9 o'clock and start time for hiking is at Ⓓ 10 o'clock, the duration is 1 hour, thus 60 minutes.

CONCLUSION

8 Summary.

T/P Summarise the lesson by confirming pupils' understanding of the main ideas in the lesson.

Sample Blackboard Plan

Date: **Chapter 3**: Time and Duration **Sub-chapter 1:** Time and Duration **Lesson** 1 of 1

Main Task: "Let's think of how to tell time and duration.

Review

How many numbers are on the clock face?

Activities

▶▶ Discuss about what the students are doing. (List students responses)

1 Let's say the times on the clocks.

Ⓐ Say "nine o'clock"

Ⓑ Say "ten minutes past nine o'clock"

Ⓒ Say "twenty-five minutes past nine o'clock"

Ⓓ Say "seventeen minutes to 10 o'clock"

Ⓔ Say "10 o'clock"

2 How many scales did the long hand move forward between 9:10 and 9:25?

9:00-------9:10----------9:25---------9:43--------10:00

15 minutes 18 minutes

It moves 15 scales.

The duration for the long hand to move on scale forward, is called one minute.

3 How many minutes did they spend in the bus?

18 minutes

It takes the long hand 60 minutes to go around the clock. 60 minutes is called one hour.

It takes one hour for the short hand to move to the next number on the clock.

60 minutes = 1 hour

4 How long did it take for them to start hiking after leaving school?

60 minutes or 1 hour

Summary

- The time taken for one long hand to move one scale is 1 minute.
- It takes the long hand 60 minutes to go around the clock face.
- 60 minutes = 1 hour

Unit 3

Unit: Time and Duration
Sub unit: 2. The Duration of One Day in Hours
Lesson 1 of 3

Textbook Page : p.32~33
Actual Lesson 016

Sub-unit Objectives

- To recognise duration as a certain amount of time by reviewing time spent in a day for one's various daily activities.
- To tell time by using the phrases "Before noon" and "After noon".
- To identify and tell time and duration to one-minute intervals by reviewing one's daily activities.

Lesson Objectives

- To recognise duration as a certain amount of time by reviewing time spent in a day for one's various daily activities.
- To tell time by using the phrases "Before noon (AM)" and "After noon (PM)"

Prior Knowledge

- All concepts learnt in this unit

Preparation

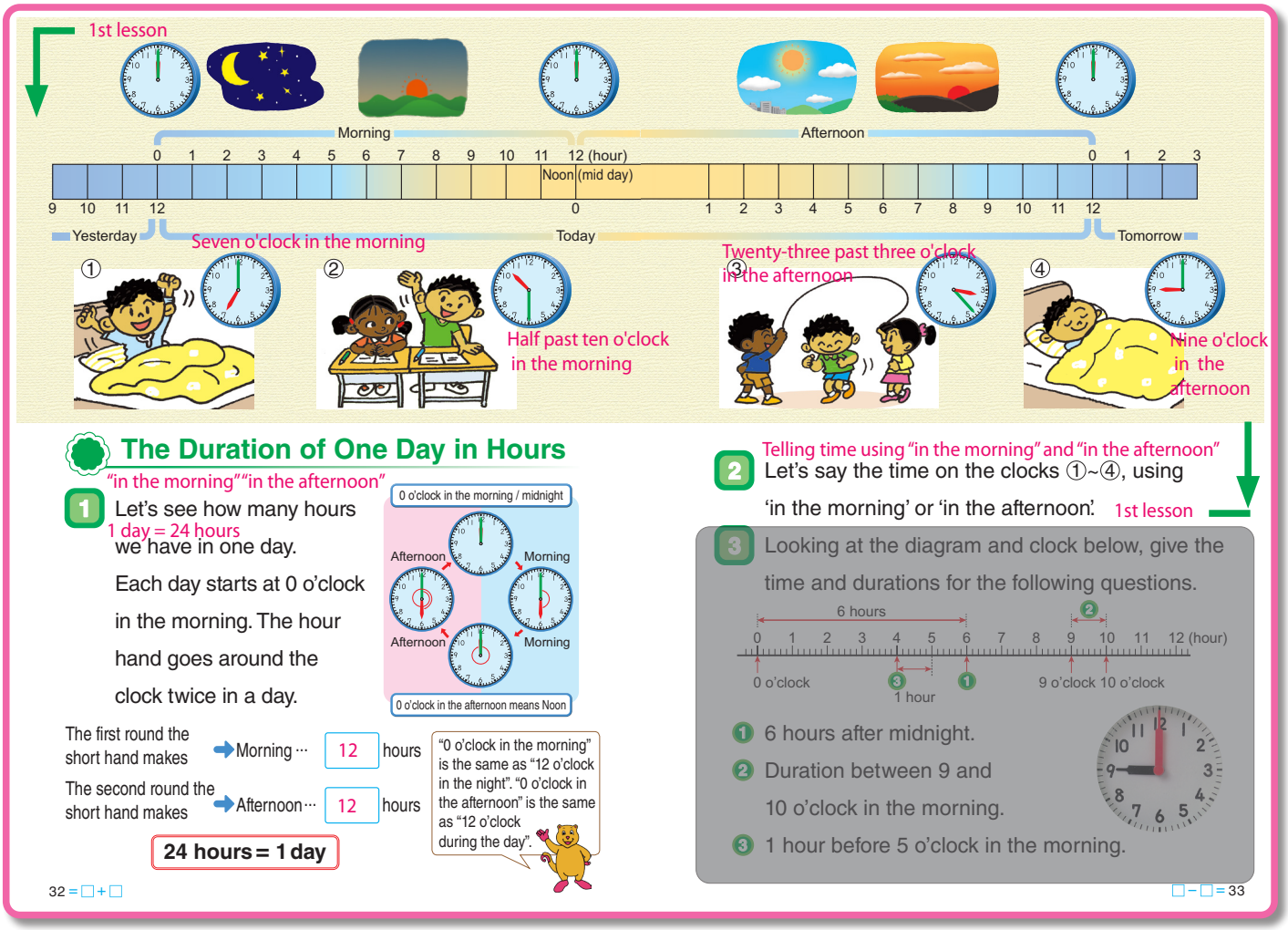
- Model clock for demonstration, time ruler (covering 24 hours),

Assessment

- Identify duration as a certain amount of time. F S
- Tell time by correctly using the phrases "before noon (AM)" and "After noon (PM)". F S

Teacher's Notes

AM and PM come from Latin. 'Ante', 'past' and 'meridiem' are Latin.
'meridiem' in Latin means 'noon'
AM stands for 'ante meridiem' which means 'Before noon'
PM stands for 'past meridiem' which means 'After noon'



Lesson Flow

INTRODUCTION

1 Review

T/P Review key ideas from the previous lesson.

BODY

2 Introduce the main task.

T Introduce and explain the main task 'Let's think of ways on how to tell time during the different parts of the day.'

3 1 Read and understand the context of the given problem.

T Explain to pupils that the beginning of a day is 0 o'clock in the morning and have them grasp this idea by looking at the picture of the time line on p.32 and 33.

P With the use of the model clocks and time rulers, pupils learn that one day is 24 hours and that 24 hours can be divided into two periods; AM (Before noon) (12 hours) and PM (After noon) (12 hours).

4 2 Look at pictures ①-④, think about what time is shown and tell the time using AM (Before noon) and PM (After noon).

TN Pupils look at how they spend a day and what they do in AM and in PM with particular attention to "time" they do such activities.

P Say the time on the clocks ①-④ using AM (in the morning) or PM (in the afternoon).

CONCLUSION

5 Summary.

T/P Summarise the lesson by confirming pupils' understanding of the main ideas in the lesson.

Sample Blackboard Plan

Date: **Chapter 3**: Time and Duration **Sub-chapter 2:** The Duration of One Day in Hours **Lesson** 1 of 3

Main Task: "Let's think of ways on how to tell time during the different parts of the day."

Review

Say the time shown



Activities

1 First round the short hand makes 12 hours

Second round the short hand makes 12 hours

24 hours = 1 day

2 Say the time on the clocks ① to ④

① Say "seven o'clock in the morning".

② Say "Half past ten o'clock in the morning".

③ Say "twenty-three past three o'clock in the afternoon".

④ Say "nine o'clock in the afternoon"

Summary

- AM means before noon and PM means after noon

Unit 3

Unit: Time and Duration
Sub unit: 2. The Duration of One Day in Hours
Lesson 2 of 3

Textbook Page : p.33~34
Actual Lesson 017

Lesson Objectives

- To identify the time which is certain hours after (or before) the original time, and also the durations (time elapsed) between two different times.
- To properly use the terms, "duration" and "time" in describing one's daily lives.
- To make one's daily schedule.

Prior Knowledge

- All concepts learnt in this unit.

Preparation

- Time ruler, Model clocks for demonstration, Worksheets "my daily schedule".

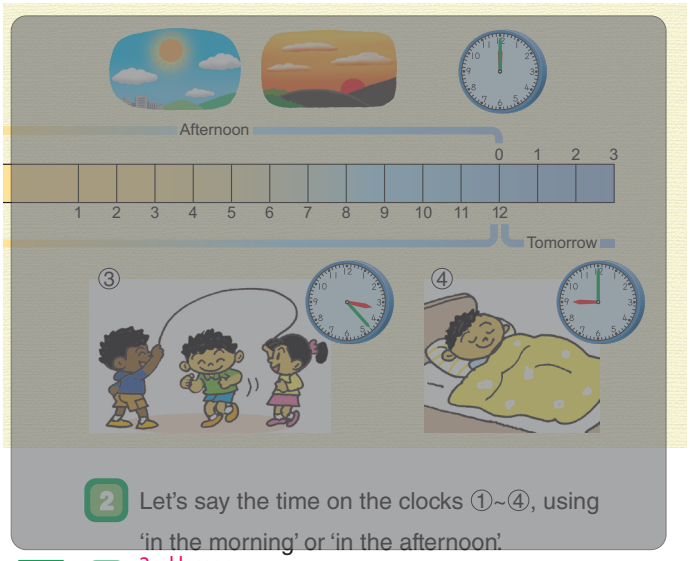
Assessment

- Identify the time that is certain hours after (or before) an original time given. F S
- Differentiate between time and duration and use the terms confidently in their daily lives. F S
- Make daily time tables or schedules. F S

Teacher's Notes

Teaching Tips: How to teach "AM—before noon" and "PM, after noon"

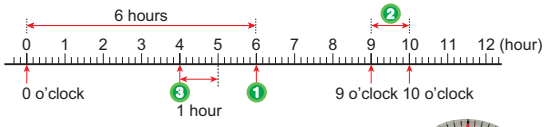
In teaching "AM" and "PM," time rulers should be used effectively to show that a day can be split into those two periods. Teacher should help pupils acquire clear understanding of the difference between the words, "time" and "durations". Durations mean the length/ amount of time between two different times, and a time simply indicates a certain moment/ point in a continuous time. Time can be indicated on a time ruler as a point, and duration is the length between two different points on the time ruler.



2 Let's say the time on the clocks ①~④, using 'in the morning' or 'in the afternoon'.

3 Looking at the diagram and clock below, give the time and durations for the following questions.

2nd lesson
Finding out time and durations



① 6 hours after midnight. 6 o'clock in the morning

② Duration between 9 and 10 o'clock in the morning. 1 hour



③ 1 hour before 5 o'clock in the morning. 4 o'clock in the morning

□ − □ = 33

34 = □ + □

If we divide 1 hour into 6 equal spaces to show on the line, how many minutes does one scale show?

4 Identifying time and durations
Let's answer the following questions by looking at the time on the diagram below.

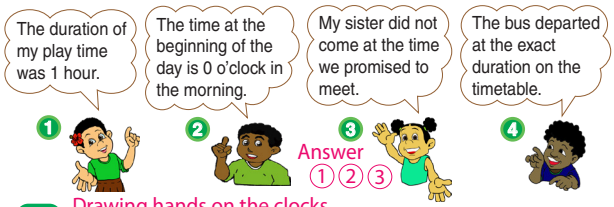


① What time is 3 hours after 3 o'clock in the afternoon? 6 o'clock in the afternoon

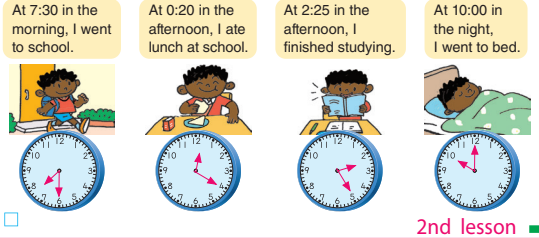
② What time is 50 minutes before 1:40 in the afternoon? 12:50 in the afternoon

③ What time is 40 minutes after 10:40 in the afternoon? 11:20 in the afternoon

5 Which is the correct way to use the words "time" and "duration"? Uses of the terms "duration" and "time"



6 Drawing hands on the clocks
Let's indicate the time by drawing the hands of the clocks so that it shows the time of each activity illustrated below.



2nd lesson

Lesson Flow

INTRODUCTION

1 Review.

T/P Review key ideas from the previous lesson.

BODY

2 Introduce the main task.

T Introduce and explain the main task'Let's think of how to tell time and duration?'

3 Finding out time and duration.

T/P 3 Read and understand the given situation.

P Complete activity 1 to 4 by using the model clocks or the pictures of clocks and timeline.

TN Teacher should make sure that pupils become familiar with the uses of both the model clocks and the pictures in finding out the time and durations.

4 Identify time and duration.

T/P 4 Read and understand the given situation.

P Answer the problems 1 to 3 by looking at a time line or a clock.

TN Teacher has pupils realise that they can apply their previous learning of identifying the simple time and durations to solve the problems 1 to 3 where they are to deal with the time and durations to the small minutes.

5 Uses of the term's duration and time.

T/P 5 Read and understand the given situation.

P Learn about how to properly use the words "time" and "duration".

P Look at the pictures of children and their phrases from 1 to 4, and tell which one uses the words "time" and "duration" correctly.

T Let pupils to explain which words in which phrases are used correctly or not correctly with the reasons.

6 6 Draw hands on the clock.

T/P Read and understand task 6.

P Look back at one's daily schedule and complete the clocks on p.34 by drawing hands on each clock based on their schedule.

P Work individually and write one's daily schedule.

T Encourage pupils to link their daily lives and the schedule with the related pictures.

CONCLUSION

7 Summary.

T/P Summarise the lesson by confirming pupils' understanding of the main ideas in the lesson.

Sample Blackboard Plan

Date: **Chapter 3**: Time and Duration **Sub-chapter 2:** The Duration of one Day in hours **Lesson** 2 of 3

Main Task: "Let's think of how to tell time and duration.

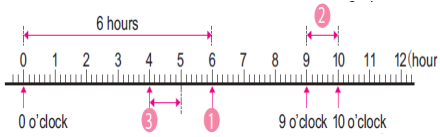
Review

How many hours are in a day?

24 hours

Activities

3 Time and Duration



1 6 o'clock in the morning

2 1 hour duration

3 4 o'clock in the morning

4 How many hours are in a day?

24 hours



1 6 o'clock in the afternoon

2 12:50 in the afternoon

3 11:20 in the afternoon

5 Which is the correct way to use the words "time" and "duration".

6 Let's draw hands on the clock



Summary

- Time is the actual moment of a period.
- Duration is the time lapse from start time to a finish time.

Unit 3

Unit: Time and Duration
Sub unit: 2. The Duration of One Day in Hours
Lesson 3 of 3

Textbook Page : p.35
Actual Lesson 018

Lesson Objective

- To recognise various ways of indicating time in pupils' environment and objects, and read the time identified.

Prior Knowledge

- All concepts learnt in this unit.

Preparation

- Receipts, airline tickets, etc.

Assessment

- Identify various ways of showing time in pupils' lives, and confidently read the time identified.

F S

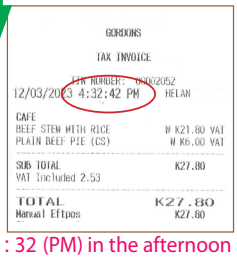
Teacher's Notes

Grasp the idea of a sexagesimal system (base-60) in digital display.
Analog clocks are useful in teaching sexagesimal system (base-60) by referring to how the long hand moves on a clock surface passing 60 marks. On the other hand, with digital clocks, while the numbers are shown on a digital display, the number after 59 is not 60 but 00: The display goes from 58, 59, 00, 01... After 59 minutes, 60 is automatically exchanged with 1hour. When using digital clocks in lessons, Teacher has to be careful with this point and provide necessary follow-up explanation to pupils.

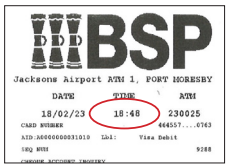
Minute on a digital display
On a digital display such as on a TV, after 7:34, for example, the time shown next one minute after is 7:35. What is displayed here is not the exact time 7:34 but one minute elapsed from 7:34 to 7:35. Digital display with seconds can also show 60 seconds elapsed from 00 to 59.

3rd lesson

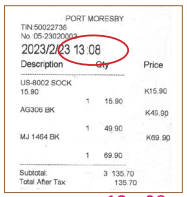
Time Printed on Receipts



4 : 32 (PM) in the afternoon



18 : 48



13 : 08



7 : 30
8 : 50
7 : 00

Use of 24 hour time

7 Anne noticed that time is shown on the receipts and a boarding card.

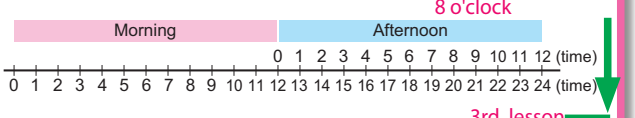
1. Let's read the times printed on each receipt.
2. When will the plane depart; in the morning or in the afternoon? 7 : 30 in the morning





1 o'clock in the afternoon is the same as 13 o'clock.

3. What time in the afternoon is 20 o'clock? 8 o'clock



3rd lesson

□ − □ = 35

Lesson Flow

INTRODUCTION

1 Review

T/P Review key ideas from the previous lesson.

BODY

2 Introduce the main task.

T Introduce and explain the main task "Let's read the times printed on receipts and air plane tickets".

3 ⑦ Recognised various ways of indicating time by looking at different receipts.

T/P Discuss the different times shown on the receipts.

P Realise that time is not written with "in the morning" and "in the afternoon".

TN Checks with pupils that the expressions, "in the morning" and "in the afternoon," are not used on the receipts, and also that numbers larger than 12 are used for indicating time.

4 Read and tell the time indicated on the receipts.

T ① Let pupils to think of the reason the expressions, "in the morning" and "in the afternoon", are not used.

P Read the times shown on the receipts.

T ② When were the plane tickets bought,in the morning or in the afternoon?

P By looking at the receipts, pupils think of whether the time was in the morning or in the afternoon.

TN Explain to pupils that time can be indicated without distinction of morning or afternoon.

5 Important point.

T/P Read and understand the important point

.

TN Prepare some concrete items such as digital clocks, TVs, DVD players or mobile phones that are using 24-hour time, i.e. 13:00, and show them to pupils as an introduction.

T Let pupils know that numbers after 12 means afternoons in time.

6 ③ Change time from 24 hour to 12-hour time.

T Ask pupils to give time in the afternoon for 20 o'clock.

P Think how to convert from 24 hour to 12-hour time.

P In reading the time ◯◯ : □□, if the number indicating the hour (◯◯) is larger than 12, we can subtract 12 from ◯◯ and describe it as "time in the afternoon".

CONCLUSION

7 Summary.

T/P Summarise the lesson by confirming pupils' understanding of the main ideas in the lesson.

Sample Blackboard Plan

Date: **Chapter 3**: Time and Duration **Sub-chapter 1:** The Duration of one Day in hours **Lesson** 3 of 3

Main Task: "Let's read the times printed on receipts and plane tickets.

Review

- Time is the actual moment of a period.
- Duration is the time lapse from start time to a finish time.

Activities

7 Time printed on receipts



① Read the times printed on each receipt.

② When will the plane depart; in the morning or in the afternoon?

7:30 in the morning

1 o'clock in the afternoon is the same as 13 o'clock

③ What time in the afternoon is 20 o'clock?

8:00 pm in the afternoon.

Summary

Time can be read in 12 hour (AM/PM) time or 24 hour clock.

Unit 3

Unit: Time and Duration
Exercise
Lesson 1 of 1

Textbook Page : p.36
Actual Lesson 019

Lesson Objective

- To deepen the understanding of the previous lessons on time and durations.

Prior Knowledge

- All concepts learnt in this unit.

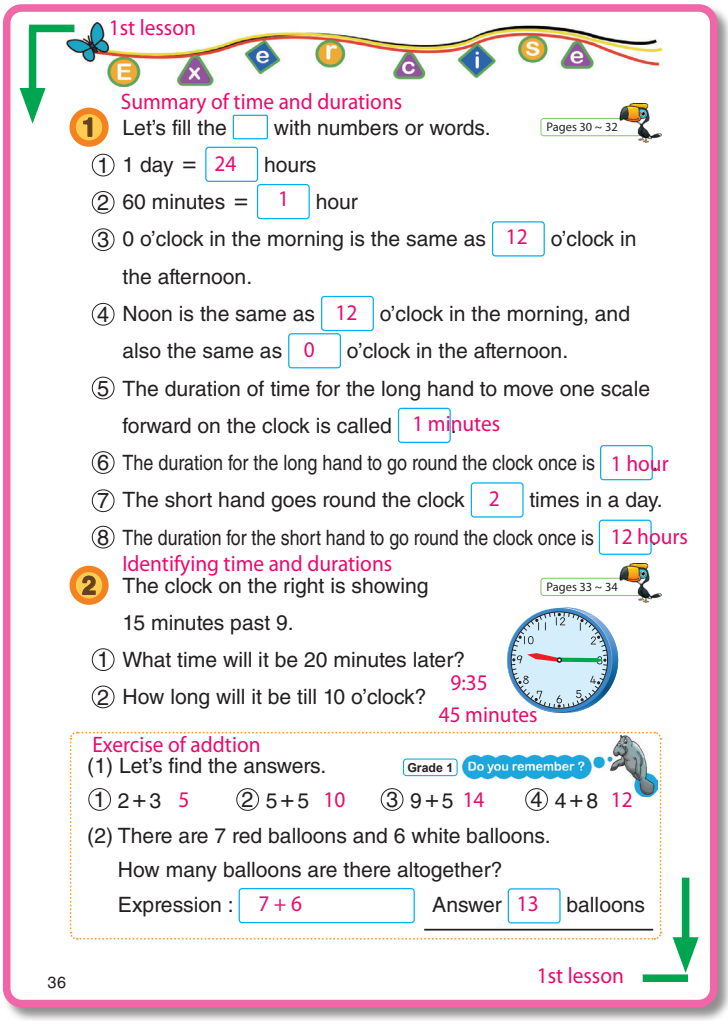
Preparation

- Evaluation sheet for the students.
- Supplementary Problems 1.

Assessment

- Deepen understanding on time and duration.

F S



1st lesson

Exercise

Summary of time and durations

1 Let's fill the ☐ with numbers or words. Pages 30 ~ 32

① 1 day = 24 hours

② 60 minutes = 1 hour

③ 0 o'clock in the morning is the same as 12 o'clock in the afternoon.

④ Noon is the same as 12 o'clock in the morning, and also the same as 0 o'clock in the afternoon.

⑤ The duration of time for the long hand to move one scale forward on the clock is called 1 minutes

⑥ The duration for the long hand to go round the clock once is 1 hour

⑦ The short hand goes round the clock 2 times in a day.

⑧ The duration for the short hand to go round the clock once is 12 hours

Identifying time and durations

2 The clock on the right is showing 15 minutes past 9. Pages 33 ~ 34

① What time will it be 20 minutes later? 9:35

② How long will it be till 10 o'clock? 45 minutes

Exercise of addtion

(1) Let's find the answers. Grade 1 Do you remember ?

① 2+3 5 ② 5+5 10 ③ 9+5 14 ④ 4+8 12

(2) There are 7 red balloons and 6 white balloons.
How many balloons are there altogether?
Expression : 7 + 6 Answer 13 balloons

36

1st lesson

Teacher's Notes

Teaching Tips: Use of Time Ruler
When we try to identify the amount/length of time, a time ruler is an effective tool.
There may be some pupils, however, who are confused in the use of a time ruler. One way to help such pupils understand the use and function of the time ruler is to give a demonstration of putting the ruler around the clock to show the correspondence between the clock and the ruler, and then straighten the ruler so that pupils would be able to perceive that these two different tools mean the same thing.
If possible, pupils can be encouraged to write a number line (hand-writing is ok) and use it as a time ruler when solving problems.

Teaching Tips: How to teach pupils to properly use the words "time" and "duration"
(Reference: Guidance on the correct use of "time" and duration)
As have been mentioned on p.34 of this book, pupils tend to confuse the words "time" and "duration". The problem 5 on p.34 showed various examples of the correct and incorrect uses of the words "time" and "duration" in our daily conversation. This aims to foster pupils' awareness of the differences in these two words and to reinforce the idea that they cannot be used interchangeably.
Teacher should also emphasise a common mistake when we are actually asked "How long~?/How many hours~?" questions (for the length of time), to which we are supposed to answer, for example, "9 hours", we make the mistake of asking the question begining with "What time~?" question and answer "9 o'clock" instead.

Lesson Flow

EXERCISE

① Solve word problem about summary of time and duration.

T Let's fill the ☐ with numbers or words.

P Tell the time and durations by applying the previous learning about how to convert units of time (day, hour, or minute), how to indicate time in writing and how to read the time and duration from clocks.

1 day = 24 hours

60 minutes = 1 hour

AM: 0:00 AM – 12:00 AM 0:00 PM

PM: 0:00 PM (12:00AM) – 12:00PM

T Let's find the length of from the given time on the clock face.

② Identifying time and duration.

P Practice identifying the elapsed time.

TN Tell pupils to find the answer by using a clock.

Sample Blackboard Plan

Date: **Chapter 3**: Time and Duration **Sub-chapter 1:** Exercise **Lesson** 1 of 1

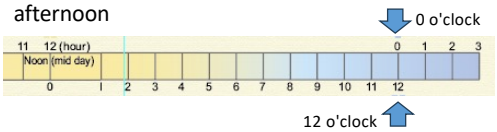
Exercise

1

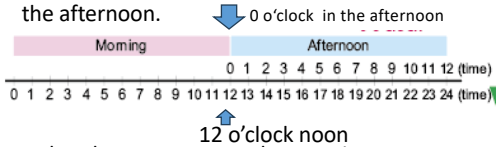
① 1 day = 24 hours

② 60 minutes = 1 hour

③ O o'clock in the morning = 12 o'clock in the afternoon



④ Noon = 12 o'clock in the morning and 0 o'clock in the afternoon.



⑤ Long hand to move one scale = 1 minutes

⑥ Long hand to go around the clock once = 1 hour

⑦ Short hand to go around 2 times in a day

mid night 0 o'clock – noon 0 o'clock (1 round)

noon 0 o'clock - mid night 0 o'clock (1 round)

⑧ The duration for the short hand to go round the clock once is 12 hours

2 The clock on the right is showing 15 minutes past 9.



① What time will it be 20 minutes later?

② How long will it be till 10 o'clock?

① 

9:15
9:20
9:25
9:30
9:35

Answer: 9:35

② 

9:15
9:25 10 mins
9:35 10 mins
9:45 10 mins
9:55 10 mins
10:00 5 mins

Answer: 45 minutes

(1) Let's find the answers. Grade 1 Do you remember?

① 2+3 = 5 ② 5+5 = 10. ③ 9+5 = 14. ④ 4+8=12

(2) There are 7 red balloons and 6 white balloons.

How many balloons are there altogether?

Expression : 7 + 6 Answer 13 balloons

Unit 3

Unit: Time and Duration
Problems 1 and 2
Lesson 1 of 1

Textbook Page : p.37~38
Actual Lesson 020

Lesson Objectives

- To review what have been learnt.
- To read and understand the context of the given problems and apply the knowledge acquired.

Prior Knowledge

- All concepts learnt in this unit.

Preparation

- Model clocks, time rulers.

Assessment

- Review what has been learned by solving the exercises. F S

Teacher's Notes

For Problems 1 and 2, Problem 1 can be given to pupils as homework and checked quickly during the lesson while Problem 2 can be done during the lesson for pupils' problem-solving practices. 1 and 2 should be done within one period.

Calculation of time.
We should keep in mind the following points.

- The numbers should be aligned according to the units (hour, minute, etc.).
- When the total in the respective unit reaches 60 in time, 60 should be instantly converted to 1 in the upper unit. In other words, 60 minutes are to be converted to 1 hour and 0 minute.
- When we try to subtract hours and minutes through calculation.

(For example: Calculating 10:05−6:40 to find the duration between these two different times)

1st lesson

Problems 1

Comparing the size of time

1 Let's write down the following times from the shortest to the longest. Answer: 60 minutes, 3hours 45 minutes, 15 hours, 1 day

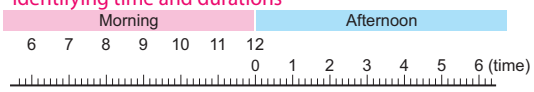
15 hours　　1 day

3 hours 45 minutes　　60 minutes

2 Let's use the clock and the diagram below to answer the following questions.



Identifying time and durations



① How long is it between 1 and 4 o'clock in the afternoon?

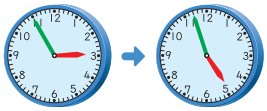
② What time is 3 hours after 11 o'clock in the morning? 2 o'clock in the aftrnoon.

③ What time is 2 hours before 1 o'clock in the afternoon? 11 o'clock in the morning

④ How long is it between 20 minutes past 9 and 10 minutes past 10 in the morning? 50 minutes

Identifying duration

3 Regina went shopping with her mother. They left home at 2:55 in the afternoon. After they were done with their shopping, they returned home at 4:57 in the afternoon. How long were they shopping?



2 hours 2 minutes



Problems 2

Comprehension of word problems

1 Kate wrote in her diary of what she did after school.

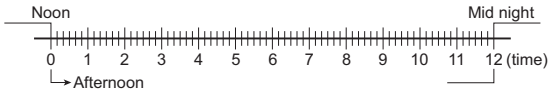
After school, I went home and then visited my grandmother. After that, when I returned home, it had already been 2 hours since I left school.
While at home, I studied for 1 hour, helped prepare dinner for 20 minutes, had dinner for 40 minutes while enjoying talking with my family, watched TV for 1 hour, played the game player for 30 minutes, took a shower for 20 minutes, and lastly prepared for the next day for 10 minutes. When I looked at the time it was exactly 9 o'clock.





① What time did Kate start watching TV? Use the scale below to help you. 7 o'clock in the afternoon

② What time did Kate leave school? Use the scale below to help you. 3 o'clock in the afternoon



1st lesson

37 38

Lesson Flow

PROBLEMS 1

1. By using their knowledge of three units in time, that is days, hours and minutes, pupils compare the duration/length of each time presented.
   - Teacher double check with pupils the basics that 1 day = 24 hours, and 1 hour = 60 minutes.
2. Pupils use a time ruler to answer the problems.
   - Teacher advises pupils to use a time ruler effectively in finding the answers.
3. Pupils calculate subtraction of hours and minutes in solving the given word problem using time ruler.
   - Pupils can apply the vertical form of subtraction.

PROBLEMS 2

1. Pupils read the diary, and take out necessary information to solve the given problem.

① What time Kate started watching TV, and
② What time Kate left school?

- Teacher confirms with pupils what they have to find out in this problem.
- Teacher has pupils realise that the only specific time stated in this problem is "9 o'clock" in the very last sentence of the whole story.
- Pupils underline the phrases in the diary which refer to certain times and durations.
- Pupils take out the related information from the diary regarding what Kate did during the time after she left home and until 9 o'clock, and write it down in a table or number line.

What Kate did	Duration / Time Elapsed
Left school and Went home	2 hours
Studied	1hour
Helped prepare dinner	20 minutes
Had dinner	40 minutes
Watched TV	1 hour
Played the game	30 minutes
Bathed	20 minutes
Prepared for the next day	10 minutes

Depending on pupils' understanding level, teacher can prepare a table like the one shown above prior to the lesson, or provide necessary follow-up explanations regarding the difference between time and durations so that pupils can comprehend the given problem with less confusion.

Sample Blackboard Plan

Date: **Chapter 3**: Time and Duration **Sub-chapter 1:** Problems 1 and 2 **Lesson** 1 of 1

Problems 1

1. Let's write down the following times from the shortest to the longest.

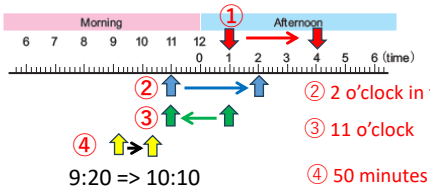
15 hours 1 day
3 hours 45 minutes 60 minutes

Shortest. ⟶ longest
60 minutes, 3hours 45 minutes, 15 hours, 1 day

2. Let's use the clock and the diagram below to answer the following questions.



① How long is it between 1 and 4 o'clock in the afternoon?
② What time is 3 hours after 11 o'clock in the morning?
③ What time is 2 hours before 1 o'clock in the afternoon?
④ How long is it between 20 minutes past 9 and 10 minutes past 10 in the morning?



9:20 => 10:10

① 3 hours
② 2 o'clock in the afternoon
③ 11 o'clock
④ 50 minutes

3. Regina went shopping with her mother. They left home at 2:55 in the afternoon. After they were done with their shopping, they returned home at 4:57 in the afternoon. How long were they shopping?



2 hours 2 minutes

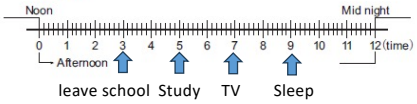
Problems 2

1. Kate wrote in her diary of what she did after school.
   ① What time did Kate start watching TV? Use the scale below to help you.
   ② What time did Kate leave school? Use the scale below to help you.

Home -> Grand mum home -> home -> 2hours
Study -> help dinner -> dinner & talking with family
1 hour. 20 mins. 40 mins
->TV - > game ->. shower -> Preparation
1 hour. 30 mins. 20 mins. 10 mins. (9 o'clock)

① 1hour + 30 + 20 + 10
1 hour and 60 minutes (1hour) .. 2 hours
2hour before 9 o'clock
Answer: 7 o'clock in the afternoon

② Study -> help dinner -> dinner … 2 hours
1 hour + 20 minutes + 40 minutes
1 hour + 60 minutes (1 hour) …. 2 hours



2 hour before 5 o'clock
Answer: 3 o'clock in the afternoon

Unit 3

Unit: Time and Duration
Have you ever seen it?
Lesson 1 of 1

Textbook Page : p.39
Actual Lesson 021

Lesson Objective

- To discover 2-digit numbers and 3-digit numbers in real life experiences.

Prior Knowledge

- Addition and Subtraction

Preparation

- Picture of the stories.

Assessment

- Demonstrate the understanding of 2-digit numbers and 3-digit numbers in amount

Teacher's Notes

The focus in this lesson is for the pupils to understand 2-digit numbers and 3-digit numbers.
Do not worry about the decimals rather the emphasis is on how many digits are there in the prices written.
This will lead into the coming topics of calculating two and three digit numbers.



Lesson Flow

INTRODUCTION

1 Review.

T/P Review the key ideas of the last lesson.

BODY

2 Introduce the main task.

T Introduce and explain the main task 'Let's discuss the situation in the picture?'.

P Look at the picture and discuss what kind of situation it is in their groups.
Response 1: It's a market place with things sold on the table.
Response 2: There are price tags for each item on the two tables.

T/P Name items from the tables and their prices.

TN Provoke students to talk about what they think about when they are at such a place.

3 How much will it cost?

T/P Name the price that have kina value and toea value from the pictures orally as a whole class.

TN Organise pupils in pairs or threes to role play as buyers and sellers at the market table/stall. Pupils swap roles after the total cost is given while teacher observe their ways of calculating the cost.

P How much will it cost if I buy 3 chewing gum?

P That will be 0.20t each (20 toea). So, altogether, it is 60 toea.

4 Look at the prices of the items and discuss about the prices in groups.

T What can you tell me about the way the prices are written?

P The prices of all the items in the first picture has 3 digits.

P The second picture has prices with 3 digits and some with 2 digits

T/P Let's list the prices shown in picture 1 and picture 2.

P Copy the way the prices are written and paste on the board

T/P Collect and put the prices that have the same but written differently and describe how they are different.

TN At this point pupils will see number in the amount and realise that a same amount is composed of 2-digit numbers and 3-digit numbers e.g. the amount 0.30t has 3 digits which are 0, 3 and 0, and as 30t which has 2 digits. This realization will lead them to think how to calculate two-digit and three-digit number together.

CONCLUSION

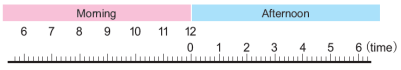
5 Summary.

T/P Summarise the lesson by confirming pupils' understanding of the main ideas.

Sample Blackboard Plan

Date: **Chapter Name: Length** **Sub-Chapter/Topic: Review** **Lesson number 2 of 2**

Review



How long is it between these times?
a) 6 o'clock and 9 o'clock in the morning.
b) 9 o'clock and 1 o'clock and 5 o'clock in the afternoon.

Main Task: **Let's discuss the situation in the picture**

Selling things on market tables



Picture 1



Picture 2

K14.00	K1.50
K5.00	K1.00
K3.50	0.50t
K3.00	0.40t
K2.50	0.30t
K2.00	0.20t

K5.00
K1.20
K1.00
50t
30t
20t

Same amount

0.50t	50t
0.30t	30t
0.20t	20t

With 3 digits | With 2 digits

Summary

Picture shows 2 digit numbers and 3 digit number.

End of Chapter Test: Chapter 3 **Date:**

Evaluation: Chapter 3 Time and Duration	Name:	Score /100

[10 points for each question]

1. What time is it?

(1) (2) (3)







_____:_____ _____:_____ _____:_____

2. Fill in the blank.

(1) 1 hour 5 minutes = _____ minutes.

(2) 65 minutes = _____hours _____minutes.

(3) 1 hour 30 minutes = _____ minutes

3. Answer the following questions. What is the ;

(1) time 4 hours after 5:00 AM. _____

(2) time 3 hours before 6:00 PM. _____

(3) duration from 7:00 PM to 11:00 PM. _____

Chapter 4 Addition in Vertical Form

1. Unit Objectives

- To deepen their understanding of addition and their ability to use them.
- Think about how to calculate the addition of 2-digit numbers and understand that those calculations can be performed based on basic calculations for 1-digit numbers. Those calculations can be done reliably. Also, understand how to calculate them.
- For simple cases, think about how to calculate addition such as 3-digit numbers.
- Investigate the properties of addition and use them to think about how to calculate and to check the calculations.
- Deal with commutative and associative laws. If necessary, ( ) can be used.

2. Teaching Overview

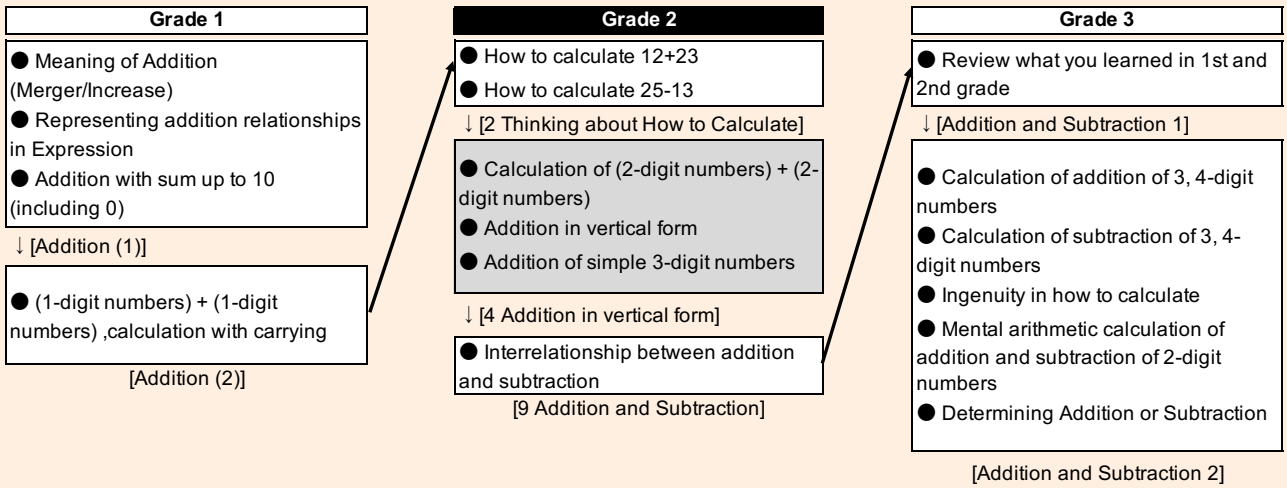
This unit is the first time that addition in vertical form is taught. It will be the basis for the addition/subtraction in vertical form that will be taught in the future, so it is important to master the basics.

Adding 2-digit Numbers, Addition with 3-digit Answers, Addition of 3-digit Numbers: Based on the learning of addition in grade 1, the main aim is to help pupils understand how to represent addition relationships in mathematical expressions, and to help them understand how to do addition in vertical form in relation to base 10 place value system.
Therefore, spend time practicing calculations in vertical form to improve calculation skills, and help pupils understand the algorithm of vertical form, in which any number exceeding 10 is carried up by one. In the initial stage of understanding calculation methods, pupils are taught the principles and rules of calculation after having them actually act through manipulations using materials such as blocks.

Rules of Addition: As a property of addition, the commutative law of addition (even if the augend and addend are exchanged and added, the answer is the same) is dealt with here for the first time.

Key Concepts: Addition of 2-digit and 3-digit numbers in vertical form.

3. Related Learning Contents



Unit 4

Unit: Addition in Vertical Form
Sub-unit: 1. Adding 2-digit Numbers
Lesson 1 of 5

Textbook Page : p.40~41
Actual Lesson 022

Sub-unit Objectives

- Understand how to calculate addition of 2-digit numbers without carry-over and how to do calculations in vertical form.
- Understand how to calculate in vertical form with (2nd place) + (2nd place), (2nd place) + (1st place), (1st place) + (2nd place).

Lesson Objective

- Express the situations where addition is used in math expressions, and consider how to calculate the addition of 2-digit numbers without carrying over.

Prior Knowledge

- Gr 2 Unit 2 Thinking about How to Calculate-Addition.

Preparation

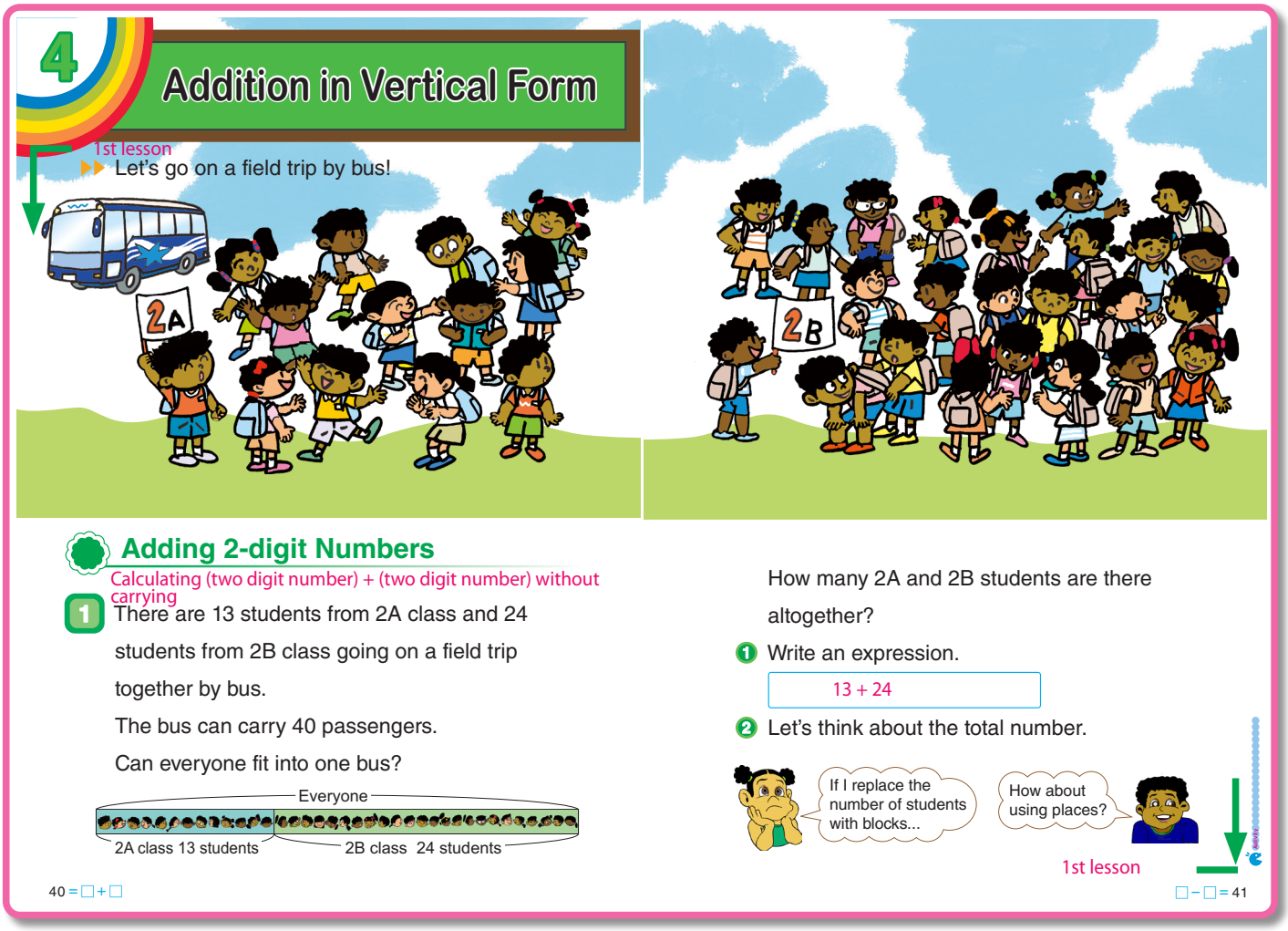
- Blocks, Tape diagram for task 1, Math problem for task 1 written on A3 paper or a chart.

Assessment

- Calculate the addition of 2-digit numbers without carrying over. F S
- Represent the math expression for 13 + 24 using block. F S

Teacher's Notes

- In this lesson it is a problem representation of adding 2-digit number + 2-digit number with no carrying. Pupils will use the 3 ideas in the text book and manipulate with blocks and align the numbers 13 + 24 in vertical form for better understanding.
- In grade 1 (Unit 4: Addition (1) pupils learn how to add 1-digit numbers less than 10 and also numbers larger than 10.



Lesson Flow

INTRODUCTION

1 Pre-discussion on "Let's go for a field trip by bus".

T/P Discuss about the different situations of total the cost.

BODY

2 Introduce the main task.

T Introduce and explain the main task, 'Let's think about a math expression to calculate the total number'.

3 1 Understand the given situation.

T/P Read the problem together.

T Let's study the story of the problem in detail.

- How many students in 2A are going for the trip? 13 students.
- How many students in 2B are going for the trip? 24 students.
- How many passengers can the bus carry? 40 students.

P Give their answers for the questions asked.

T "Think about whether it is addition or subtraction based on the problem".

P Explain whether it is addition or subtraction based on the problem.

TN Pupils can use the tape diagram to explain by focusing on the number of 2A and 2B students.

4 Math expression of the problem.

T Ask pupils to do representation of the problem using blocks or other materials and write the math expression for activity 1.

P Do representation using blocks or other materials and write the math expression for activity 1.

5 Think about how to calculate 13 + 24.

T 2 Let's think about the total number.

P Use the blocks and arrange the blocks to find the answer to 13 + 24.

T Let's compare the number of all passengers with the capacity of the bus.

- Can everyone fit into one bus?

P Share their ideas to the question.

CONCLUSION

6 Summary.

T/P Summarise the lesson by confirming pupils' understanding of the main ideas in the lesson.

Sample Blackboard Plan

Date: **Chapter 4: Addition in Vertical Form** **Sub-chapter 1: Adding 2-digit Numbers** **Lesson 1 of 5**

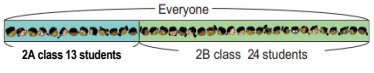
Main Task: Let's think about a math expression to calculate the total number.

Review

Pre-discussion on "Let's go on a field trip".
- What are these children in the picture doing?

Activities

1 There are 13 students from 2A class and 24 from 2B class going on a field trip together by bus. The bus can carry 40 passengers. Can everyone fit into one bus?

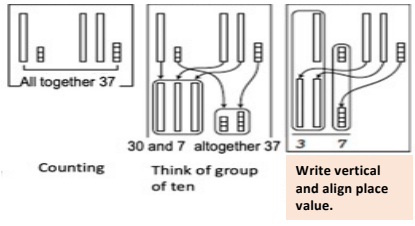


1 How many 2A and 2B are there altogether?
Math Sentence: 13 + 24 = 37

37 students

Less than 40 students. All students are able to take one bus.

2 Think about the Total number.



Summary

Do calculation with representation using blocks or other material.

Unit 4

Unit: Addition in Vertical Form
Sub-unit: 1. Adding 2-digit Numbers
Lesson 2 of 5

Textbook Page : p.42~43
Actual Lesson 023

Lesson Objective

- To understand how to calculate addition without carrying; (two-digit number) + (one-digit number) and (one-digit number) + (two-digit number).

Prior Knowledge

- G1 Unit 10 Addition (2).
- Gr 2 Unit 2 Thinking about How to Calculate-Addition.

Preparation

- Place value chart, mathematics blocks, number cards.

Assessment

- Calculate addition of (two-digit number) + (one-digit number) and (one-digit number) + (two-digit number) without carrying in vertical form. F S

Teacher's Notes

- Assist pupils realise that the pictures with the mathematics blocks shown on p.42 look similar to Vavi's idea back on p.26.
- By looking at Kim's idea, pupils recognise Kim adds the number in the tens place first and then adds those in the ones place, 3 + 4.
- By looking at Enoch's idea, pupils recognise Enoch adds the numbers in the ones place first and then adds those in the tens place.
- By looking at Joan's idea, pupils recognise Joan adds the numbers in each respective place, ones and tens places, at the same time and write the answers all at once.

2nd lesson

③ 13 + 24 can be written vertically by putting numbers in the same places in the same columns. This is called the **Vertical Form**. Let's think about how to calculate using vertical form.

$$\begin{array}{r} 13 \\ +\ 24 \end{array}$$

Kim

$$\begin{array}{r} 13 \\ +\ 24 \\ \hline 30 \\ +\ \ 7 \\ \hline 37 \end{array}$$

Enoch

$$\begin{array}{r} 13 \\ +\ 24 \\ \hline 7 \\ +30 \\ \hline 37 \end{array}$$

Joan

$$\begin{array}{r} 13 \\ +\ 24 \\ \hline 37 \end{array}$$

Tens place	Ones place
1	3
2	4
3	7

How to Add 13+24 Using Vertical Form

$$\begin{array}{r} 13 \\ +\ 24 \end{array} \rightarrow \begin{array}{r} 13 \\ +\ 24 \\ \hline 37 \end{array}$$

1+2=3 3+4=7

Align numbers according to their place value.

Add numbers in the ones place, and numbers in the tens place.

Math sentence : 13 + 24 = 37

Answer : 37 people



Exercise

Let's find the answers using vertical form.

① 31 + 57 88 ② 26 + 43 69 ③ 15 + 62 77 ④ 65 + 31 96

⑤ 18 + 40 58 ⑥ 32 + 20 52 ⑦ 50 + 36 86 ⑧ 20 + 70 90

② Let's think about how to find the answer for 2 + 41 using vertical form.

Addition in vertical forms: (one digit number) + (two digit number)

① Which one is the correct way to write?

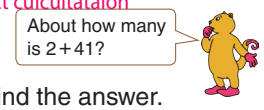


$$\begin{array}{r} 2 \\ +41 \end{array}$$

$$\begin{array}{r} \ \ 2 \\ +41 \end{array}$$



Correct culcultataion



② Use the vertical form to find the answer.

Tens place	Ones place

		2
+	4	1
	4	3





In vertical form, the same place values are written in the same column, and numbers in the same place are added.

Exercise

Let's find the answers using vertical form.

① 4 + 23 27 ② 7 + 82 89 ③ 91 + 8 99 ④ 65 + 3 68

2nd lesson

Lesson Flow

INTRODUCTION

1 Review.

T/P Review key ideas from the previous lesson.

BODY

2 Introduce the main task.

T Introduce and explain the main task, 'Let's think about how to calculate 13 + 24 using vertical form'.

3 Understand how to calculate 13 + 24.

T Explain how to write the expression in vertical form and think of how to solve it.

P ③ Think about how to write and calculate 13 + 24 in vertical form.

T Refer to and make correspondence with the mathematics block chart and demonstrates how to write the expression in vertical form.

P Manipulates with the blocks using the block chart to display 13 + 24 as the teacher demonstrates and confirm that everyone can fit in the bus.

4 Exercise.

T/P Practice using vertical forms to solve the Exercise and the teacher confirms the answers.

5 ② Think about how to solve 2 + 41 in vertical form.

T Let's think about how to find the answer for 2 + 41 using vertical form.

T/P Look at activity ① and think about which is the correct way.

P Explain why it is not correct for the incorrect answer.

6 Solve 2 + 41

T ② Use the vertical form to find the answer.

P Look at the block chart and align 2 + 41 in their place value vertically and write the answer.

TN Help pupils recognise that 2 is a one-digit number, therefore it should be written in the ones place. Pupils have to be mindful of writing each number in the appropriate column according to its place value.

T/P Read the important point and the teacher explains.

7 Exercise.

T/P Do the exercise and the teacher confirms and corrects the answers.

CONCLUSION

8 Summary.

T/P Summarise the lesson by confirming pupils' understanding of the main ideas in the lesson.

Sample Blackboard Plan

Date: **Chapter 4: Addition in Vertical Form** **Sub-chapter 1: Adding 2-digit Numbers** **Lesson: 2 of 5**

Main Task: Let's think about how to calculate 13 + 24 using vertical form.

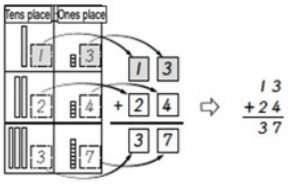
Review

When we represent 13 + 24 with blocks and materials in our environment it is easier to calculate.

Activities

① ③

How to calculate 13 + 24



How to calculate using vertical form 13 + 24

(1) Align numbers for each place value.
(2) Add numbers in the ones place, and numbers in the tens place.

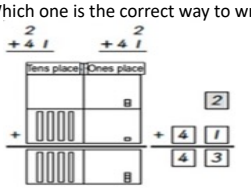
Exercise

Find the answers in vertical form.

1. 31 + 57 =
2. 18 + 40 =
3. 50 + 36 =
4. 20 + 70 =

② Think about how to find the answer for 2 + 41 using vertical form.

① Which one is the correct way to write?



② Use the vertical form to find the answer.

Let's write to align place value.

Answer 43

Important Point

In vertical form, the same place values are written in the same column, and numbers in the same place are added.

Exercise

Find answers using vertical form.

1. 4 + 23 =
2. 7 + 82 =
3. 91 + 8 =
4. 65 + 3 =

Summary

Important Points to remember;

- Align numbers according to their same place value.
- Add numbers in the ones place, and numbers in the tens place.

Unit 4

Unit: Addition in Vertical Form
Sub-unit: 1. Adding 2-digit Numbers
Lesson 3 of 5

Textbook Page : p.44
Actual Lesson 024

Lesson Objective

- Add two-digit numbers, (two-digit number) + (two-digit number) and to understand the meaning of carrying by making correspondence between the blocks and actual calculations in vertical forms.

Prior Knowledge

- Grade 2 Unit 2 Thinking about How to Calculate-Addition.
- Adding 2-digit numbers without carrying or regrouping.

Preparation

- Mathematics blocks, place value chart, the task 3 written on a large paper for posting.

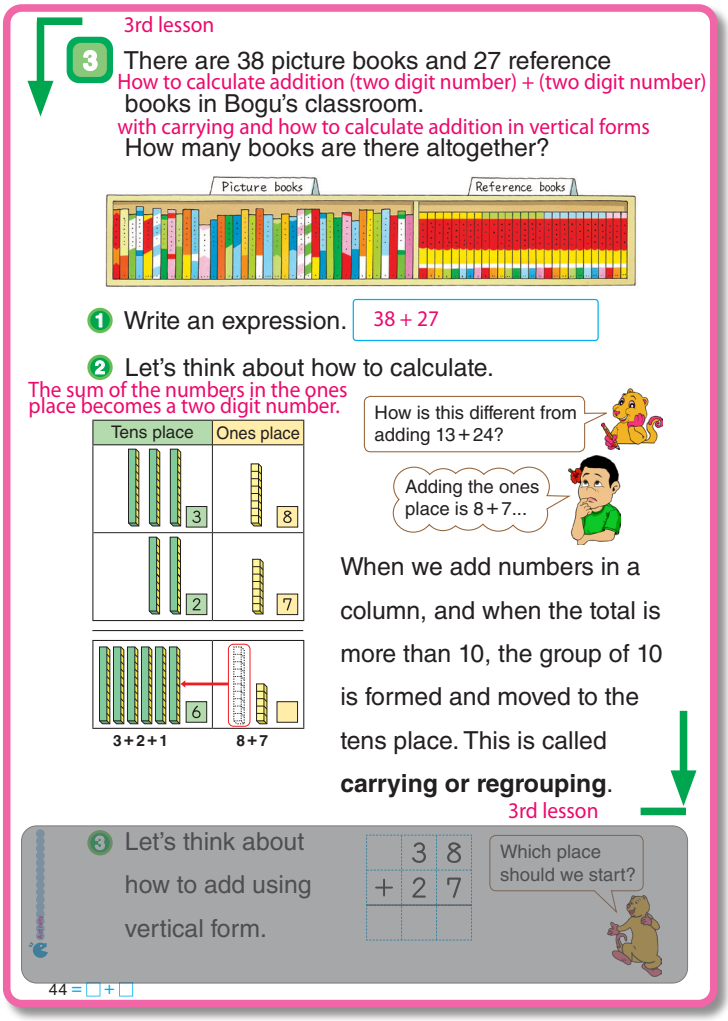
Assessment

- Calculate addition of (two-digit number) + (two-digit number) with carrying in vertical form. F S
- Carrying or regrouping 1 ten (10 ones) from one's place to the tens place. F S

Teacher's Notes

The calculation process in this lesson is just the same as how we calculated addition without carrying in the previous lessons.
The only difference is that when two numbers are added, the sum of the numbers in the ones place becomes a two-digit number instead of one digit as in the previous lessons. Pupils should be able to realise this difference, and further explore how to solve the problem.
In this lesson, Teacher should highlight a step of forming a group of 10 (1 ten) and moving 1 ten to the tens place. This rule is indeed based on the decimal system; when a number in the ones place reaches 10, that 10 is regrouped as 1 in the tens place.
Teaching Tips: Manipulation of Mathematics Blocks
Adding 8 and 7 blocks that are in the ones place.

1 Out of the 15 blocks in the ones place, putting 10 into a box of 10 and moving it to the tens place.
2 Adding 3 and 2 boxes in the tens place to get the sum of 5. Then adding again another box carried from the ones place and finding out the sum of 6 boxes altogether.
3 Telling the answer, 65.



Lesson Flow

INTRODUCTION

1 Review.

T/P Review key ideas from the previous lesson.

BODY

2 Introduce the main task.

T Introduce and explain the main task, 'Let's think about how to calculate 38 + 27 with carrying in vertical form using blocks.'

3 ③ Understand the situation.

T/P Read and understand the situation and discuss.

P Think of the context of the problem and write a math expression in activity ①.

4 Think about how to calculate.

T ② Advise pupils to think about how to calculate 38 + 27 in vertical form.

P Think about how to calculate 38 + 27 in vertical form using blocks and block representation chart.

TN Let's pupils compare 38 + 27 and 13 + 24, how is different?

P Compare how 38 + 27 is different from 13 + 24.

T Let pupil realise by using the block chart representation that in calculating 38 + 27, the number in the ones place becomes larger than 10 and explains that in such a case, telling them it is called "carrying" or "regrouping".

P Manipulates with the blocks using the block chart to display 38 + 27 to practice carrying or regrouping and explaining their ideas.

TN It is important here to compare calculations with carrying and without carrying, and identify the differences and similarities in both.

5 Meaning of carrying or regrouping.

T Explain that when we add numbers in a column and the total is more than 10, the set of 10 is formed and moved to the tens place.
This is called carrying or regrouping.

CONCLUSION

6 Summary.

T/P Summarise the lesson by confirming pupils' understanding of the main ideas in the lesson.

Sample Blackboard Plan

Date: **Chapter 4: Addition in Vertical Form** **Sub-chapter 1: Adding 2-digit Numbers** **Lesson: 3 of 5**

Main Task: : Let's think about how to calculate 38 + 27 with carrying in vertical form using blocks.

Review

Calculate 18 + 41 and explain.

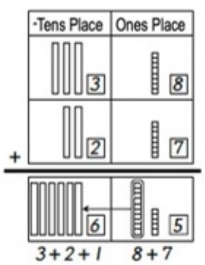
Activities

3 There are 38 picture books and 27 reference books in Bogu's classroom.
How many books are there altogether?



① Math Expression: 38 + 27

② How to calculate in vertical form.



〈How to calculate〉

- Ones Place 8 + 7 = 15
We leave 5 single blocks in the ones place, put the other 10 blocks into a box and move it to the tens place.
- Tens Place 3 + 2 = 5
moved up from the ones place is added to the tens place. 5 + 1 = 6
- 65 books altogether

When the number in the ones place is larger than 10, we can form a group of 10, and move 1 ten to the tens place.
Means **Carrying or Regrouping**

Summary

The sum /answer of the numbers in the ones place becomes a two digit number.

Unit 4

Unit: Addition in Vertical Form
Sub-unit: 1. Adding 2-digit Numbers
Lesson 4 of 5

Textbook Page : p.44~46
Actual Lesson 025

Lesson Objective

- To understand how to calculate addition of two-digit numbers with carrying, (two-digit number) + (two-digit number), and try to solve various problems.

Prior Knowledge

- G1 Unit 10 Addition (2).
- Gr 2 Unit 2 Thinking about How to Calculate-Addition,

Preparation

- Place value chart, mathematics blocks.

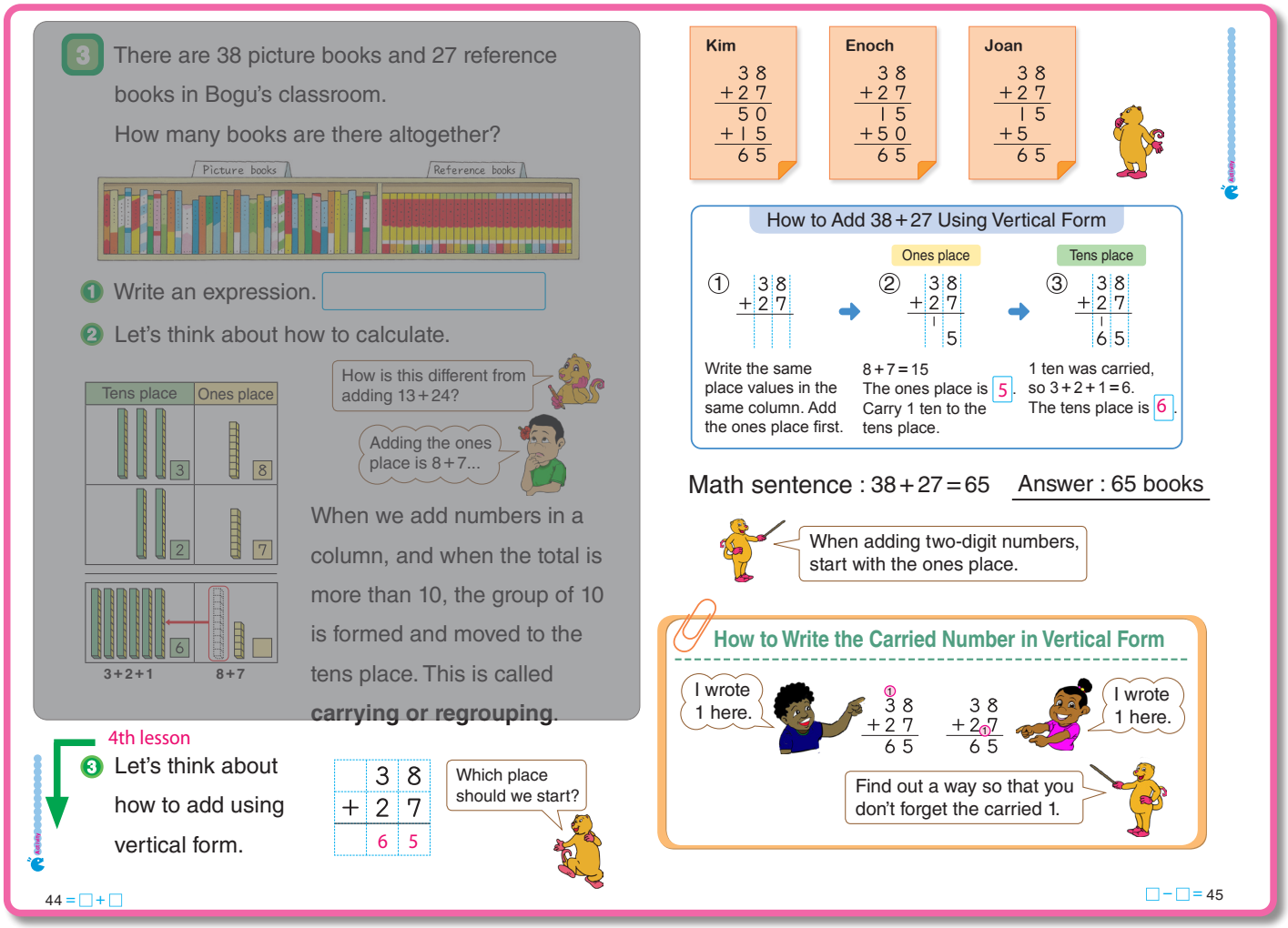
Assessment

- Solve addition of (two-digit number) + (two-digit number), with carrying in vertical form. F S

Teacher's Notes

Teaching Tips: Understanding of Kim, Enoch and Joan's Ideas

- Kim's idea,
  Kim adds the number in the tens place first and then adds those in the ones place, 8 + 7.
- Enoch's idea,
  Enoch adds the numbers in the ones place first and then adds those in the tens place.
- Joan's idea,
  Joan adds the numbers in ones place 8 + 7 and writes 15 aligning in the place value and then adds numbers in the tens place.



Lesson Flow

INTRODUCTION

1 Review.

T/P Review key ideas from the previous lesson.

BODY

2 Introduce the main task.

T Introduce and explain the main task, 'Let's think about how to calculate 38 + 27 using vertical form'.

3 Write 38 + 27 in vertical form and think about how to solve it.

T ③ Let's write the expression 38 + 27 in vertical form and predict the answer in mind.

P Write the expression in vertical form and predict the answer.

T/P Let's look at the following ideas (Kim, Enoch, Joan) together and discuss in group.

TN Refer to 'Techers Notes' for explainations of each ideas.

T Explain what Kapul is saying—"when adding 2-digit numbers, start with the ones place".

4 Emphasise steps to use when adding in vertical form.

T/P Go over the important steps on page 46, 'How to add using vertical form'.

P Write the expression and the answer.

5 How to write the carried number in vertical form.

T "Look at Yamo's and Sare's idea and share their ideas about how not to forget the carried number".

P When adding 2-digit numbers, start with the ones place.

TN Emphasise the importance of indicating the carried over number.

6 Find the answer for 14 + 29.

T ④ Find the answer for 14 + 29 using vertical form

P Line up the numbers in their place value and present the problem in vertical form.

7 Find the mistakes in vertical form and correct it.

T ⑤ Let's find mistakes in the vertical form, correct it and find the answers.

P Find the mistakes in activities ① and ② by correcting it and writing the numbers in vertical form.

T/P Correct the mistakes from carried number being forgotten, the lining up of digits not in the correct place values and the incorrect answer.

8 Exercise.

T/P Do the exercise and teacher confirm and correct the answers.

CONCLUSION

9 Summary.

T/P Summarise the lesson by confirming pupils' understanding of the main ideas in the lesson.

Due to space limitations, the Sample Blackboard Plan is placed on page 69.

How to calculate addition (two digit number) + (two digit number) with carrying

④ Find the answer for 14 + 29 using vertical form.

	1	4
+	2	9
	4	3



Ones place: 4+9=13 → Write 3 in the one place.
Tens place: 1+2+1=4 → Write 4 in the tens place.

⑤ Let's find mistakes in the vertical form, correct it, and find the answers.

How to correctly calculate addition in a vertical form

① 27 + 65

$$\begin{array}{r} 27 \\ +\,65 \\ \hline 82 \end{array}$$

	2	7
+	6	5
	9	2



Forgetting the carried 1

② 56 + 3

$$\begin{array}{r} 56 \\ +\,3 \\ \hline 86 \end{array}$$

	5	6
+		3
	5	9



Writing 3 in the tens place instead of in the ones place

Exercise

Let's find the answers using vertical form.

① 28 + 16 44 ② 47 + 27 74 ③ 59 + 36 95 ④ 15 + 56 71

⑤ 43 + 38 81 ⑥ 18 + 78 96 ⑦ 24 + 19 43 ⑧ 49 + 13 62

4th lesson

46 = □ + □

Unit 4

Unit: Addition in Vertical Form
Sub-unit: 1. Adding 2-digit Numbers
Lesson 5 of 5

Textbook Page : p.47~48
Actual Lesson 026

Lesson Objectives

- To think how to calculate addition (two-digit number) + (one or two-digit number) with carrying.
- To deepen the understanding of the previous lessons' learning contents.

Prior Knowledge

- Gr 2 Unit 2 Thinking about How to Calculate-Addition.
- Contents on lesson 4.
- Unit 4 contents.

Preparation

- Place value chart, mathematics blocks.

Assessment

- Solve (two-digit number) + (two-digit number) correctly. F S
- Solve (two-digit number) + (one-digit number) correctly. F S

Teacher's Notes

These Supplementary Problems can be given to the fast learners or for further practices.

1. Solve the problems using a vertical form.

①	64+16 〔80〕	②	25+35 〔60〕
③	36+34 〔70〕	④	48+4 〔52〕
⑤	27+6 〔33〕	⑥	8+63 〔71〕
⑦	7+35 〔42〕	⑧	81+9 〔90〕
⑨	4+56 〔60〕		

2. Carol picked 6 flowers and Elijah picked 13 flowers. How many did they pick altogether? (Answer 19 flowers)
3. Israel has 23 stickers. His brother has 17 stickers. How many stickers do they have altogether? (Answer 40 stickers)
4. I had 37 pieces of paper. My friends gave me 8 pieces of paper. How many do I have now? (Answer 45 pieces of paper)

5th lesson

How to calculate addition in vertical form: when the ones place is 0.

6 How can we find the answer for 27+53 using vertical form?

	2	7
+	5	3
	8	0

Ones place: 7+3=10 → Write 0 in the one place.
Tens place: 2+5+1=8 → Write 8 in the tens place.

7 How can we find the answer for 35+6 using vertical form?

	3	5
+		6
	4	1



How to calculate addition (two digit number) + (one digit number) with carrying



Ones place: 5+6=11 → Write 1 in the one place.
Tens place: 3+1=4 → Write 4 in the tens place.

8 How can we find the answer for 7+23 using vertical form?

		7
+	2	3
	3	0



How to calculate addition (one digit number) + (two digit number) with carrying

Ones place: 7+3=10 → Write 0 in the one place.
Tens place: 2+1=30 → Write 0 in the tens place.

Exercise

Let's find the answers using vertical form.

① 72+18 90 ② 35+45 80 ③ 16+24 40 ④ 33+17 50
⑤ 54+7 61 ⑥ 77+9 86 ⑦ 6+89 95 ⑧ 5+15 20

□−□=47

48

Exercise

Calculating addition in vertical form

1 Let's find the answers using vertical form.

Pages 42 ~ 47

① 84+15 99 ② 23+60 83 ③ 31+42 73 ④ 76+11 87
⑤ 36+2 38 ⑥ 19+18 37 ⑦ 28+63 91 ⑧ 45+37 82
⑨ 71+19 90 ⑩ 8+44 52 ⑪ 56+4 60 ⑫ 5+25 30



Word problem with addition (one digit number) + (two digit number) without carrying

2 Tintin caught 7 talapias and Giles caught 12 talapias. How many talapias did they catch altogether?

7 + 12 = 19 Answer: 19 talapias

Page 43

Word problem with addition (two digit number) + (two digit number) with carrying

3 Carol picked 17 flowers and Shama picked 23 flowers. How many flowers did they pick altogether?

17 + 23 = 40
Answer: 40 flowers

Page 47



Word problem with addition (two digit number) + (one digit number) with carrying

4 Emily had 58 cards. Her friend gave her 7 more. How many cards does she have now?

58 + 7 = 65
Answer: 65 cards

Page 47

5th lesson

Lesson Flow

INTRODUCTION

1 Review.

T/P Review key ideas from the previous lesson.

BODY

2 Introduce the main task.

T Introduce and explain the main task, "Let's think about how to calculate in vertical form."

3 6 Think about how to solve 27 + 53.

T/P How can we find the answer 27 + 53 in vertical form.

T Ask students to discuss and then present their ideas in class.

P Explain their ideas on how they calculate 27 + 53 in vertical form.

TN Confirm the answer and then reinforce with steps adding and carrying processes.

4 7 Think about how to solve 35 + 6.

T Ask the pupils to predict the answer mentally.

P Work individually to solve the problem.

TN Confirm the answer and then reinforce with steps for adding and carrying processes.

5 8 Think about how to solve 7 + 23.

T Ask the pupils to predict the answer mentally.

P Work individually to solve the problem.

TN Confirm the answer and then reinforce with steps for adding and carrying processes.

6 Exercise.

P Do the Exercise.

T/P Correct the Exercise.

TN Confirm the answer and then reinforce with steps for adding and carrying processes.

7 Sub-unit Exercise.

P Do the exercise.

T/P Correct the exercise.

TN 1 Pupils calculate addition in vertical form to be reminded of:

(1) writing numbers in the same places in the same columns, and,

(2) indicating the carried number if any in 1-4.

CONCLUSION

8 Summary.

T/P Summarise the lesson by confirming pupils' understanding of the main ideas in the lesson.

Sample Blackboard Plan

Date: **Chapter 4: Addition in Vertical Form** **Sub-chapter 1: Adding 2-digit Numbers** **Lesson: 5 of 5**

Main Task: : Let's think about how to calculate in vertical form.

Review

Review the important point ①,②, ③. from solving 14 + 29.

Activities

How to calculate in a vertical form

★ Make sure to write numbers in the same places in the same columns.

6 27+53 — Ones Place, Tens Place

7 35+6 — Ones Place, Tens Place

8 7+23

Write 0 in the ones place.

Exercise

Let's find the answers using vertical form.

① 72+18 ② 35+45 ③ 16+24 ④ 33+17

⑤ 54+7 ⑥ 77+9 ⑦ 6+89 ⑧ 5+15

Exercises

Complete Sub-unit Exercises.

①, ②, ③ and ④

Summary

(1) Writing numbers in the same places in the same columns.

(2) Write the carried number if any and continue to add.

Unit 4

Unit: Addition in Vertical Form
Sub-unit: 2. Addition with 3-digit Answers
Lesson 1 of 2

Textbook Page : p.49
Actual Lesson 027

Sub-unit Objective

- To understand how to calculate addition (two-digit number) + (two-digit number) with carrying to the tens place and hundreds place.

Lesson Objective

- To think how to calculate addition (two-digit number) + (two-digit number) with carrying to the hundreds place.

Prior Knowledge

- Gr 2 Unit 2 Thinking about How to Calculate-Addition.
- Contents on lesson 5.

Preparation

- Mathematics blocks, place value chart, the Problem 1 written on a large paper.

Assessment

- Solve (two-digit number) + (two-digit number) to give a 3-digit answer. F S

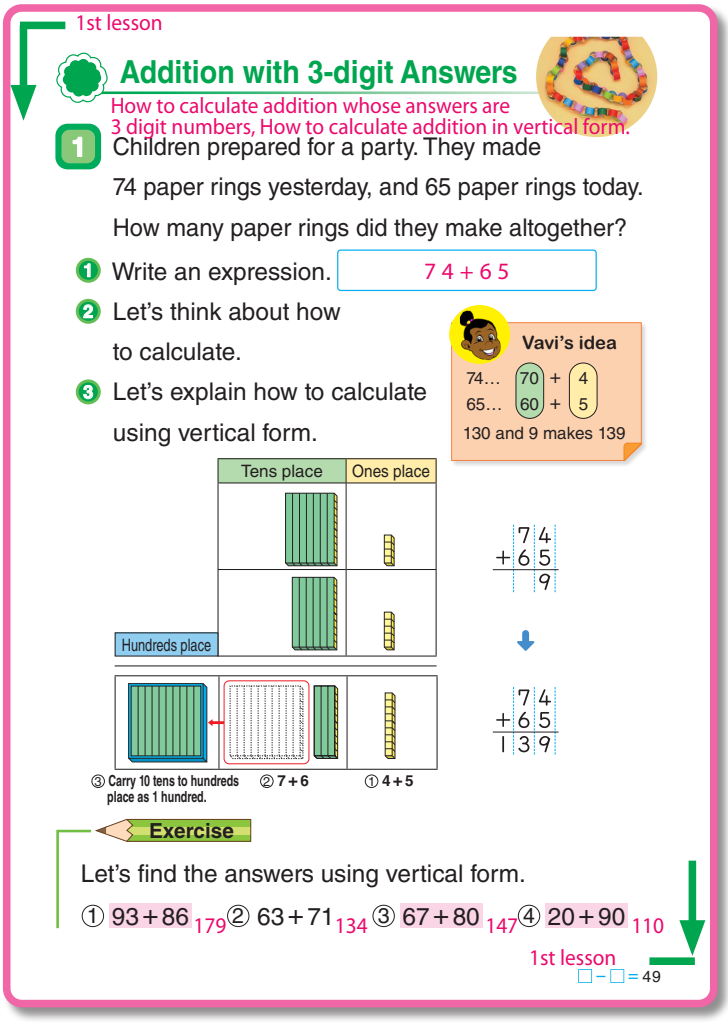
Teacher's Notes

Teaching Tips: To Teach Three Digit Numbers
When mathematics blocks are not available, Teacher can have pupils use their notebooks to write block pictures in a table like the one below.

Hundreds Place	Tens Place	Ones Place

As a way to practice reading and writing three -digit numbers with absent values, Teacher has pupils do an activity as below in pairs.

- Prepare three envelops with the descriptions as shown on the right.
- Put number cards 0-9 in each of the envelops. (Not putting a card 0 in the hundreds place envelop)
- Have pupils take out one card from each envelop and have them practice reading and writing the formed three digit number.



Lesson Flow

INTRODUCTION

1 Review.

T/P Review key ideas from the previous lesson.

BODY

2 Introduce the main task.

T Introduce and explain the main task, 'Let's think about how to add 74 + 65.'

3 ① Read and understand the task.

T/P Read and understand the problem.

P Think about what they have to find out and what they already know.

P ① Write a math expression in their exercise books.

4 Think about how to solve 74 + 65.

T ② Ask the pupils to think about how to solve the problem.

P Work individually and write their ideas to solve the problem.

T Emphasise on Vavi's idea.

TN Advise pupils to use the knowledge of their previous lessons in solving the problem. They can use the mathematics blocks and think of the steps of calculation involving grouping, carrying, etc.

P Present and share their ideas in class.

5 Explain how to solve 74 + 65 using vertical form.

T ③ Let's explain how to add using vertical form.

P Give their ideas based on carrying from ones place to tens place.

TN Let pupils realise that there are 4 and 5 blocks in the ones place, and 7 and 6 sets of 10 blocks in the tens place using the block chart diagram representation.

T Refer students' attention to the textbook to see the manipulation of the blocks and confirm understanding.

P Recognise that in the tens place there are 13 sets of 10 blocks, out of which they have to carry 10 tens is carried to the hundreds place as 1 hundred.

6 Exercise.

T Solve the problem in vertical form.

P Do the exercise.

T/P Correct the exercise.

CONCLUSION

7 Summary.

T/P Summarise the lesson by confirming pupils' understanding of the main ideas in the lesson.

Sample Blackboard Plan

Date: **Chapter 4: Addition in Vertical Form** **Sub-chapter 2: Addition with 3-digit Answers** **Lesson: 1 of 2**

Main Task: Let's think about how to add 74 + 65.

Review

Calculate 25 + 48 and explain.

Activities

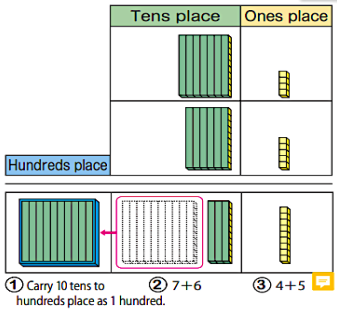
1 Party paper rings
Yesterday- 74 and Today – 65.
How many paper rings altogether?
Math Expression:
74 + 65

① Write an expression.
74 + 65

② Think about how to calculate.

74 →70 + 4
65→60 + 5
70 + 60 = 130 4+5 =9
130 +9 = 139
Answer 139 paper rings

③ Let's use the vertical form to solve it: Blocks.



*Be careful with the carried numbers.
In Vertical Form.

$$\begin{array}{r} 74 \\ +\ 65 \\ \hline 9 \end{array}$$

$$\begin{array}{r} 74 \\ +\ 65 \\ \hline 139 \end{array}$$

Exercise

Let's find the answers using vertical form.

① 93+86 ② 63+71 ③ 67+80 ④ 20+90

Summary

Two digit number plus two digit number with carrying to the hundreds place.

Unit 4

Unit: Addition in Vertical Form
Sub-unit: 2. Addition with 3-digit Answers
Lesson 2 of 2

Textbook Page : p.50
Actual Lesson 028

Lesson Objective

- To think how to calculate addition (2-digit number) + (2-digit number) with carrying to the tens place and hundreds place.

Prior Knowledge

- Gr 2 Unit 2 Thinking about How to Calculate-Addition.
- Contents on lesson 6.

Preparation

- Mathematics blocks, place value chart, number cards.

Assessment

- Solve (two-digit number) + (two-digit number) with carrying to tens place and then to hundreds place. F S

Teacher's Notes

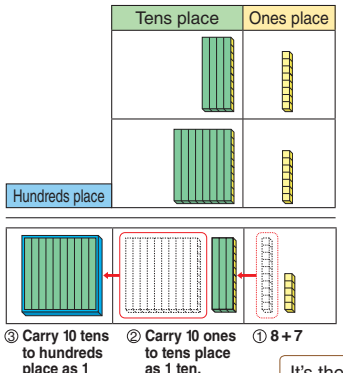
With the use of the mathematics blocks, mastering addition with carrying would not take much time for most pupils who already have basic calculation skills. Also, for pupils who are still weak in basic calculations, the use of blocks can help them acquire better and clearer understanding of calculation procedures than trying to deal only with abstract numbers without using concrete materials.

In order to provide timely and adequate guidance and instruction to pupils, it is important that Teacher assesses pupils' understanding in every lesson immediately. For this, Teacher has to carefully look at each individual's work during lessons, assesses individuals understanding and provides relevant and adequate individual guidance and instructions accordingly.

2nd lesson

How to calculate addition with two times of carrying

2 Let's explain how to calculate 48 + 87 using vertical form.



$$\begin{array}{r} 48 \\ +87 \\ \hline 135 \end{array}$$



It's the same as adding the numbers in the ones and tens place separately and then adding the two results.

$$\begin{array}{r} 48 \\ +87 \\ \hline 12 \\ 135 \end{array}$$

How to calculate addition of numbers whose answers are 3 digit numbers with 0 in the tens place

3 Let's think about how to calculate 37 + 67 using vertical form.

	3	7
+	6	7
1	0	4



What will the number in the tens place become?

Exercise

Let's find the answers using vertical form.

① 35 + 96 131 ② 88 + 44 132 ③ 36 + 89 125 ④ 58 + 62 120

⑤ 27 + 78 105 ⑥ 32 + 69 101 ⑦ 15 + 85 100 ⑧ 6 + 97 103

2nd lesson

50 = □ + □

Lesson Flow

INTRODUCTION

1 Review

T/P Review key ideas from the previous lesson.

BODY

2 Introduce the main task.

T Introduce and explain the main task, "Let's think about how to carry 1 ten (10 ones) to tens place and 1 hundred (10 tens) to hundreds place."

3 (2) Explain how to solve 48 + 47.

T/P Read and understand the problem.

T Refer pupils' attention to the Textbook to use the mathematics blocks and help pupils to visualize how to place the blocks in such a way that they can visualise the expression 48 + 87 to find the answer.

P Work individually and present their ideas.

T Present to pupils the expression 48 + 87, written in vertical form and have them recognise how the numbers are carried to the tens place and hundreds place by showing them the manipulation of blocks according to the given expression.

8 + 7 Carry 1 ten (10 ones) to the tens place

4 + 8 + 1 Carry 1 hundred (10 tens) to the hundreds place

TN Emphasise on what the Kapul: Adding numbers in the ones place and then in tens place separately and then adding the two results.

4 (3) Think about how to solve 37 + 67 using vertical form.

T Let's think about how to solve the problem.

P Work individually and explain how they solved the problem.

T Explain that;

- The ones place is 7 + 7 = 14.
- Do not forget the carried number 1(10 ones are carried over to the tens place. As a result, the tens place becomes 3 + 6 + 1 = 10.
- Advise pupils again not to forget carrying 1 hundred (10 tens) to the hundreds place.

P Compare their ideas and explanation done by the teacher for consolidation and correction.

5 Exercise.

T Let the pupils solve the problem in vertical form.

P Do the exercise.

T/P Correct the exercise.

TN With the problem 58 + 62, the ones place becomes 0. Teacher should advise pupils to remember to write 0 in the ones place.

CONCLUSION

6 Summary.

T/P Summarise the lesson by confirming pupils' understanding of the main ideas in the lesson.

Sample Blackboard Plan

Date: **Chapter 4: Addition in Vertical Form** **Sub-chapter 2: Addition with 3-digit Numbers** **Lesson: 2 of 2**

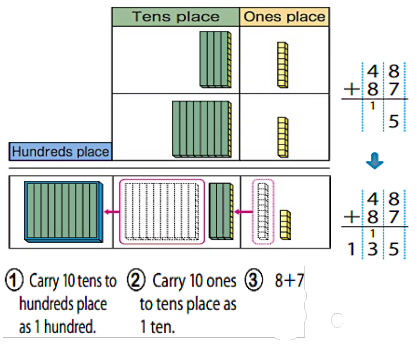
Main Task: Let's think about how to carry 1 ten (10 ones) to tens place and 1 hundred (10 tens) to hundreds place.

Review

Two digit number plus two digit number with carrying to the hundreds place.

Activities

2 How to add 48 + 47 using vertical form.



3 Think of how to calculate 37 + 67 in vertical form.

3 7
+ 6 7
1 0 4

① 7+7=14
② Carry 1 ten to the tens place.
③ 3 + 6 + 1 = 10
④ Write 0 in the tens place.
⑤ Carry 10 tens to the tens place as 1 hundred.
⑥ The answer is 104.
Answer 104

Exercise

① 35 + 96
④ 58 + 62
⑤ 27 + 78
⑦ 15 + 85
⑧ 6 + 97

Summary

Calculating addition with carrying twice from ones' place to tens' place, then from tens' place to the hundreds place.

Unit 4

Unit: Addition in Vertical Form
Sub-unit: 3. Addition of 3-digit Numbers
Lesson 1 of 2

Textbook Page : p.51
Actual Lesson 029

Sub-unit Objective

- To think how to calculate simple addition of three-digit numbers and understand how to calculate in vertical form.

Lesson Objectives

- Think about how to calculate addition of (3 digit) + (3 digit) numbers.
- Calculate the addition of (3 digit) + (3 digit) numbers whose sum is 1000.

Prior Knowledge

- Unit 1 Numbers up to 1000
- Carrying 1 ten (10 ones) to tens place and 1 hundred (10 tens) to hundreds place.

Preparation

- 10 sets of 100 sheets of papers, task 1 written on the chart.

Assessment

- Solve addition with (3 digit) + (3 digit) correctly. F S
- Solve addition of numbers whose sum is 1000. F S

Teacher's Notes

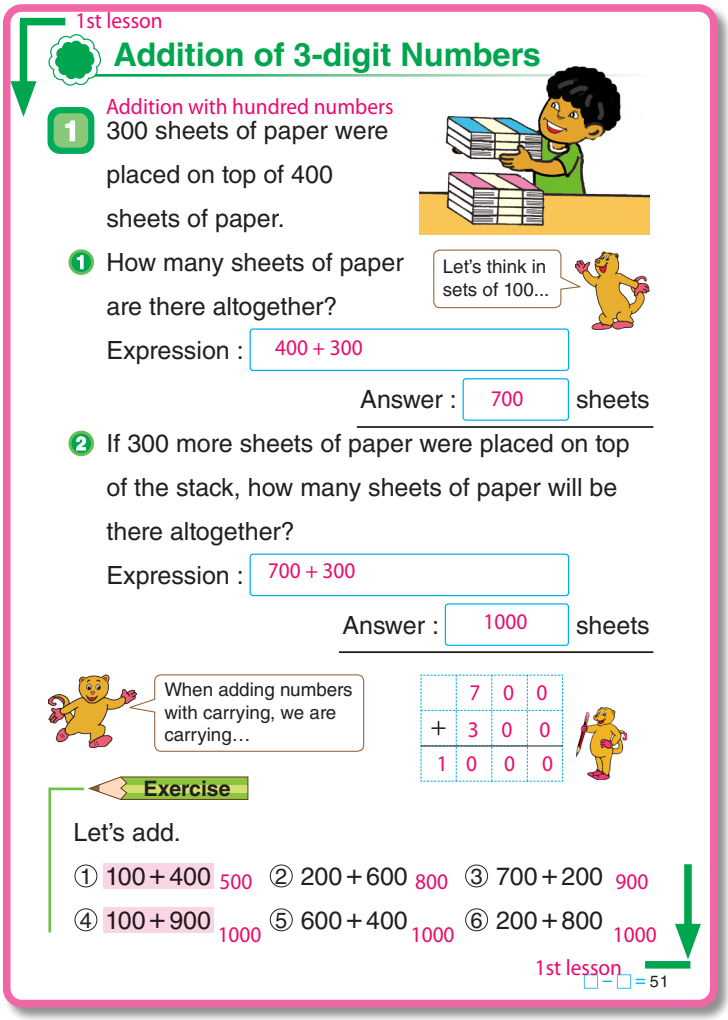
- Using the prior knowledge in addition in vertical form to calculate (2 digit) + (2 digit) numbers the pupils will align the numbers in their place value and add. In this lesson the pupils will add 3-digit numbers with zero (0) in the ones and tens place.

- Supplementary Problems

(1) ① 300 + 600 ② 600 + 200
③ 500 + 500 ④ 300 + 700

Answers: ① 900, ② 800,
③ 1000, ④ 1000

(2) Make a math word problem for the expression 400 + 300.



Lesson Flow

INTRODUCTION

1 Review

T/P Review key ideas from the previous lesson.

BODY

2 Introduce the main task.

T Introduce and explain the main task, "Let's think about how to add 3-digit numbers in vertical form."

3 ① Read and understand the problem.

T/P Read and understand the context of the problem.

T Let pupils realise that the numbers used in the problem are three-digit numbers.

T Demonstrate the problem on how the sheets of paper are added by doing the following;

1) Put set of 300 sheets and 400 sheets separately.
2) Do the movement of putting 300 sheets of paper on top of 400 sheets of paper.
3) What kind of scene is seen from this demonstration?

P Identify that the movement of putting sheets of paper on top of the other is a scene of addition.

4 Thinking in sets of 100 to find the total number of sheets of paper.

T ① How many sheets of paper are there altogether?

TN Consider how to think in sets of 100s. Remind students of 10 sets of 10 is 100, therefore 3 sets 100 is 300 and 4 sets of 100 is 400. When we add them altogether 3 + 4 = 7 sets of 100 is 700.

P Make a math expression and find the answer in activity. 300 + 400 So, 300 + 400 = 700 sheets

T Check and confirm pupils answers.

5 Adding 300 more to get the sum of 1000.

T/P ② Read and understand the context of the problem.

T Demonstrate the action of adding 300 more sheets of paper that this is again a situation of addition.

P Make a math expression.

TN Explain Kapul's idea.

P Calculate in vertical form to find the answer 700 + 300 = 1000, Answer; 1000 sheets

6 Exercise.

P Do the exercise.

T/P Do the correction.

CONCLUSION

7 Summary.

T/P Summarise the lesson by confirming pupils' understanding of the main ideas in the lesson.

Sample Blackboard Plan

Date: **Chapter 4: Addition in Vertical Form** **Sub-chapter 3: Addition of 3-digit Numbers** **Lesson 1of 2**

Main Task : Let's think about how to add 3-digit numbers in vertical form.

Review

Calculate this problem and explain.
1. 69 + 52

Activities

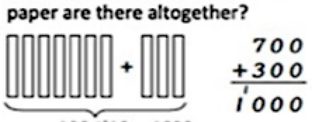
1 300 sheets of paper were placed on top of 400 sheets of paper.

1 How many sheets of paper are there altogether?



7 sets of 100 · · · 700
Answer: 700 sheets

2 If 300 more sheets of paper are placed on top of the stack, how many sheets of paper are there altogether?



10 sets of 100 · · · 1000
Answer: 1000 sheets

Exercise

Let's add.

① 100 + 400 = 500
② 200 + 600 = 800
③ 700 + 200 = 900
④ 100 + 900 = 1000
⑤ 600 + 400 = 1000
⑥ 200 + 800 = 1000

Summary

10 sets of 100 is 1000.

Unit 4

Unit: Addition in Vertical Form
Sub-unit: 3. Addition of 3-digit Numbers
Lesson 2 of 2

Textbook Page : p.52
Actual Lesson 030

Lesson Objective

- To think about how to calculate addition (three-digit number) + (one/two-digit number).

Prior Knowledge

- Calculating (3 digit) + (3 digit) numbers.

Preparation

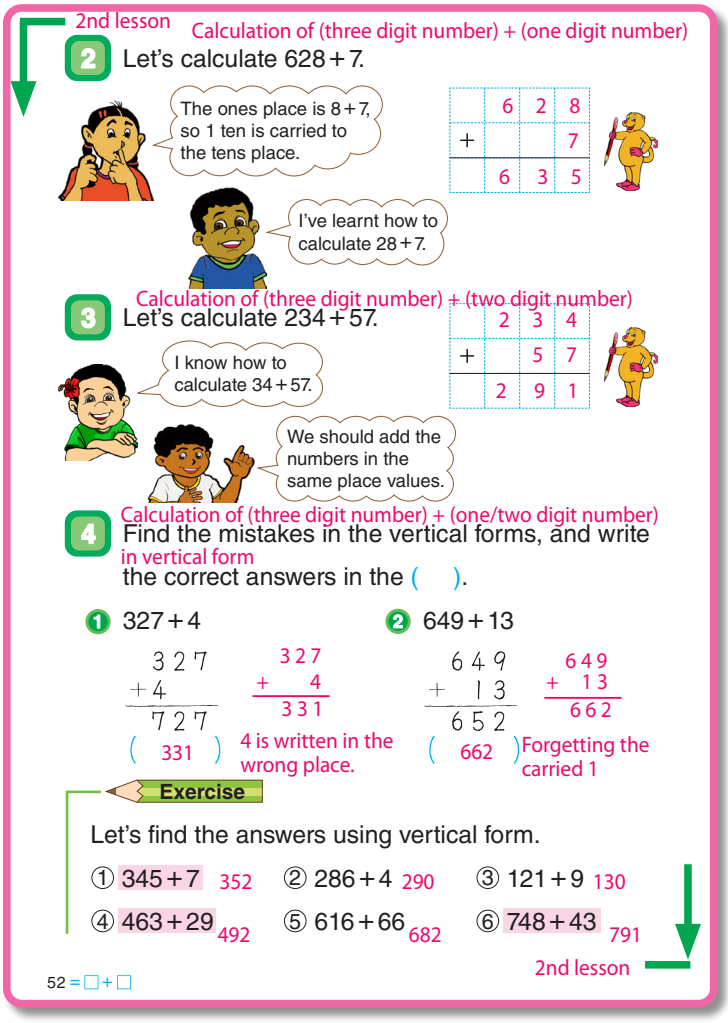
- Task 2, 3 and 4 written on the chart.

Assessment

- Calculate addition with (three-digit) + (one/two-digit) numbers. F S

Teacher's Notes

- In this lesson the pupils will calculate addition of (three-digit numbers) + (1-digit-number and 2-digit numbers with carrying. Using prior knowledge of the calculation will help. Assist those who are in need to manipulate with blocks and then using the place value chart.
- Pupils will have problems of aligning numbers in the wrong place value resulting in incorrect answers. Secondly, they also forget about the carried number. Therefore, task 4 is a good practice for them. Supplementary problems can be done as home work.



Lesson Flow

INTRODUCTION

1 Review

T/P Review key ideas from the previous lesson.

BODY

2 Introduce the main task.

T Introduce and explain the main task", Let's think about how to add 3-digit with 1-digit and 2-digit numbers in vertical form."

3 2 Addition of 3-digit number with 1-digit number.

T/P Read and understand the context of adding 628 + 7.

TN Advice pupils that the main idea is still about adding 3-digit numbers in vertical form. The focus of this lesson is to add 3-digit number with 1-digit and 2-digti numbers.

P Discuss and present ideas about the speech bubbles and identify hints to help them with the calculation.

TN This is their first time to add three-digit number and one-digit number. Addition with carrying in this problem can be done in the same way as they did with two-digit numbers.

P Solve 628 + 7 in vertical form. 628 + 7 = 635

T Confirm the calculation in vertical form together in class.

4 3 Addition of 3-digit number with 2-digit number.

T/P Read and understand the context of the problem 234 + 57.

Lesson Flow

P Discuss and present their ideas about the speech bubbles and identify hints to help them with the calculation.

P Solve 234 + 57 in vertical form.

TN Addition with carrying in this problem can be done in the same way as they did with two-digit numbers. Pupils should understand that by calculating 4 + 7 = 11, 1 ten should be carried to the tens place.

5 4 Identify the mistakes, correcting them and find the right answer.

T/P Read and understand the context of problem.

T Explain to the pupils to find the mistakes in 1 and 2 and correct them in the ( ).

T/P Work together to identify the mistakes, correct them and solve the problem in vertical form.

6 Exercise.

P Do the exercise

T/P Correct the exercise.

CONCLUSION

7 Summary.

T/P Summarise the lesson by confirming pupils' understanding of the main ideas in the lesson.

p.59

Sample Blackboard Plan

Date: **Chapter 4: Addition in Vertical Form** **Sub-chapter 1: Adding 2-digit Numbers** **Lesson: 4 of 5**

Main Task: Let's think about how to calculate 38 + 27 using vertical form.

Review

Let's review what addition of two digit numbers are.
Carrying or regrouping 1 ten (10 ones) from one's place to the tens place.

Activities

3 3 Let's think about how to add 38 + 27 in vertical form.

Reminder:
1. Never forget the carried 1.
2. Write numbers in the correct columns.

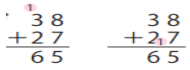
1. Write number in the same place value and same column.

2. Add numbers in the ones place.
8 + 7 = 15
Carry 1 ten to the tens place, Write 5 in ones place.

3. Add numbers in tens place and add the carried 1.
3 + 2 + 1 = 6.
Answer: 65



How to Write the carried number in vertical form



Answer: 65 books

4 Calculate 14 + 29 in vertical form.

5 Find mistakes from 1 2 and correct it.

Exercise

Let's find the answers using vertical form.

① 28 + 16 ② 47 + 27 ③ 59 + 36 ④ 15 + 56
⑤ 43 + 38 ⑥ 18 + 78 ⑦ 24 + 19 ⑧ 49 + 13

Summary

Review the important point ①, ②, ③.

Sample Blackboard Plan

Date: **Chapter 4: Addition in Vertical Form** **Sub-chapter 3: Addition of 3-digit Numbers** **Lesson: 2 of 2**

Main Task: Let's think about how to add 3-digit with 1-digit and 2-digit numbers in vertical form.

Review

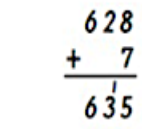
Calculate this problem and explain.
1. 600 + 700

Activities

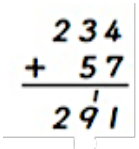
Adding 3 digit numbers

1. Write numbers in the same place value in the same column
2. Do not forget carrying and then add.

2 Let's calculate 628 + 7

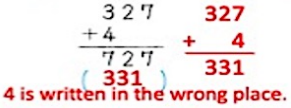


3 Let's calculate 234 + 57



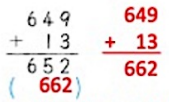
4 Find the mistakes and write correct answers.

1 327 + 4



4 is written in the wrong place.

2 649 + 13



Forgetting the carried 1

Exercise

Let's find the answers using vertical form.

① 345 + 7 ② 286 + 4 ③ 121 + 9
④ 463 + 29 ⑤ 616 + 66 ⑥ 748 + 43

Summary

When adding 3 digit numbers with 1-digit or 2-digit numbers remember to:
1. write numbers in same place value.
2. Add in same place and Don't forget to carry and then add.

Unit 4

Unit: Addition in Vertical Form
Sub-unit: 4. Rules of Addition
Lesson 1 of 2

Textbook Page : p.53~54
Actual Lesson 031

Sub-unit Objectives

- To understand that in addition, the sum remains the same even if augend and addend are switched.
- To understand that in addition of three numbers, the sum remains the same regardless of whether the first two numbers or the last two numbers are added first.

Lesson Objective

- Add (2-digit number) + (2-digit number) and find out that in addition, the sum remains the same even if two numbers are switched.

Prior Knowledge

- Adding 2-digit numbers.
- Adding 3-digit numbers with 2 and 1-digit numbers

Preparation

- Task 1 and important point written on the chart, blocks for guava representation.

Assessment

- Add to get the same sum when the augend and addend are switched. F S

Teacher's Notes

Teaching Tips: Confirmation of Answers in Addition

In this lesson pupils are taught to understand the use of the commutative law of addition.

For example 38 + 16 = 16 + 38

The lesson focuses on the point that in addition, the sum remains the same even if augends and addends are switched.

Confirmation of answers in addition will be closely looked at on P.68 where the associative law of addition is introduced.

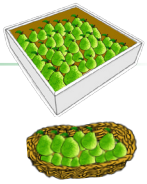
1st lesson

Rules of Addition

Commutative law of addition

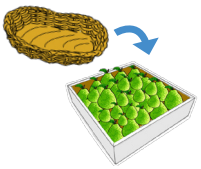
1 There are 38 guavas in a box and 16 guavas in a basket.

How many guavas are there altogether?



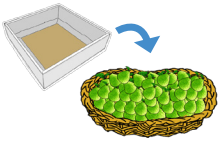
① Let's put the guavas from the basket into the box.

38 + 16 = 54
augend addend sum



② Let's put the guavas from the box into the basket.

16 + 38 = 54
augend addend sum



When adding numbers, the sum remains the same even if the two numbers are switched.

38 + 16 = 16 + 38

The sums are the same, so we can connect them by "=".



□ − □ = 53

2 Let's add the following, and switch the numbers to check your answers.

① 24 + 31 = 55 (31 + 24 = 55) ② 45 + 16 = 61 (16 + 45 = 61) ③ 50 + 38 = 88 (38 + 50 = 88) ④ 9 + 76 = 85 (76 + 9 = 85)

1st lesson

3 Let's add 32 + 7 + 3.

Kekeni's idea

After I calculate 32 + 7, I then add 3 to the sum.

$$\begin{array}{r} 32 \\ +\ 7 \\ \hline 39 \end{array} \qquad \begin{array}{r} 39 \\ +\ 3 \\ \hline \square \end{array}$$

Naiko's idea

7 + 3 = 10, so I add 10 to 32.

$$\begin{array}{r} 32 \\ +\ 10 \\ \hline \square \end{array}$$

In addition you can change the order of calculation.

(32 + 7) + 3 = 32 + (7 + 3)

You calculate the numbers in the ( ) first.

Which two numbers should you add first to solve in a simpler way?

Exercise

Let's find the easier way to calculate.

① 45 + 18 + 2 ② 58 + 13 + 27

③ 23 + 68 + 12 ④ 6 + 37 + 44

54 = □ + □

Lesson Flow

INTRODUCTION

1 Review

T/P Review key ideas from the previous lesson.

BODY

2 Introduce the main task.

T Introduce and explain the main task, "Let's think about the rules of addition."

3 ① Understand and demonstrate the situation

T ① How many guavas are there altogether?

T Writes 38 + 16 = sum on the board and explains which number is the augend and which is the addend with its meaning to find the sum.

P Manipulate using blocks to demonstrate the movement of 16 guavas in the basket into the box with 38 guavas to find the sum as 54.

4 Understand and demonstrate the situation.

T/P ② Read and understand the context of the problem.

T Writes 16 + 38 = sum on the board and ask pupils to manipulate with blocks or concrete objects to do an actual demonstration of movement of activity 2 and find the sum.

P Manipulate using blocks to demonstrate the movement of 38 strawberries from the box into the basket with 16 strewberries to find the sum as 54.

5 Rules of addition.

T What did you find out from activity ① and ② ?

P Expected responses;

- Problems/situations in ① and ② are different.
- In ① and ② the augend and addend are switched.
- The sum is the same.

T/P Read the important point in the ____ and the teacher explains.

6 ② Switching the numbers in addition to check the answer.

T/P Read and understand the context of the problem.

T Get the pupils to add, switch the numbers and add again to check the answers.

P Calculate all activities ①, ②, ③, ④ using vertical form to find that the sum of both expressions are the same.

	2	4
+	3	1
	5	5

	3	1
+	2	4
	5	5

CONCLUSION

7 Summary.

T/P Summarise the lesson by confirming pupils' understanding of the main ideas in the lesson.

Sample Blackboard Plan

Date: **Chapter 4: Addition in Vertical Form** **Sub-chapter 4: Rules of Addition** **Lesson:** 1 of 1

Main Task: Let's think about the rules of addition.

Review

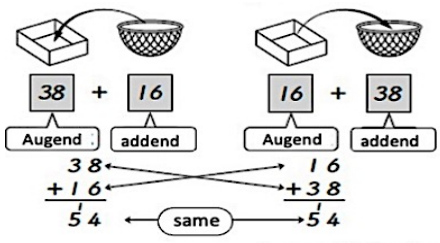
Calculate this problem and explain.
1. 319 + 85

Activities

1 There are 38 guavas in a box and 16 guavas in a basket.
How many guavas are there altogether?

① Putting guavas from the basket into the box

② Putting guavas into the basket.



Answer: 54 strawberries

When adding numbers, the sum remains the same even if the two numbers are switched.
38+16=16+38

2 Let's add the following and switch the numbers to check your answers.

① 24+31 ② 45+16
③ 50+38 ④ 9+76

Summary

When adding numbers, the sum remains the same even if the two numbers are switched.

Unit 4

Unit: Addition in Vertical Form
Sub-unit: 4. Rules of Addition
Lesson 2 of 2

Textbook Page : p.54
Actual Lesson 032

Lesson Objective

- To understand that in addition of three numbers, the sum remains the same regardless of whether the first two numbers or the last two numbers are added first.

Prior Knowledge

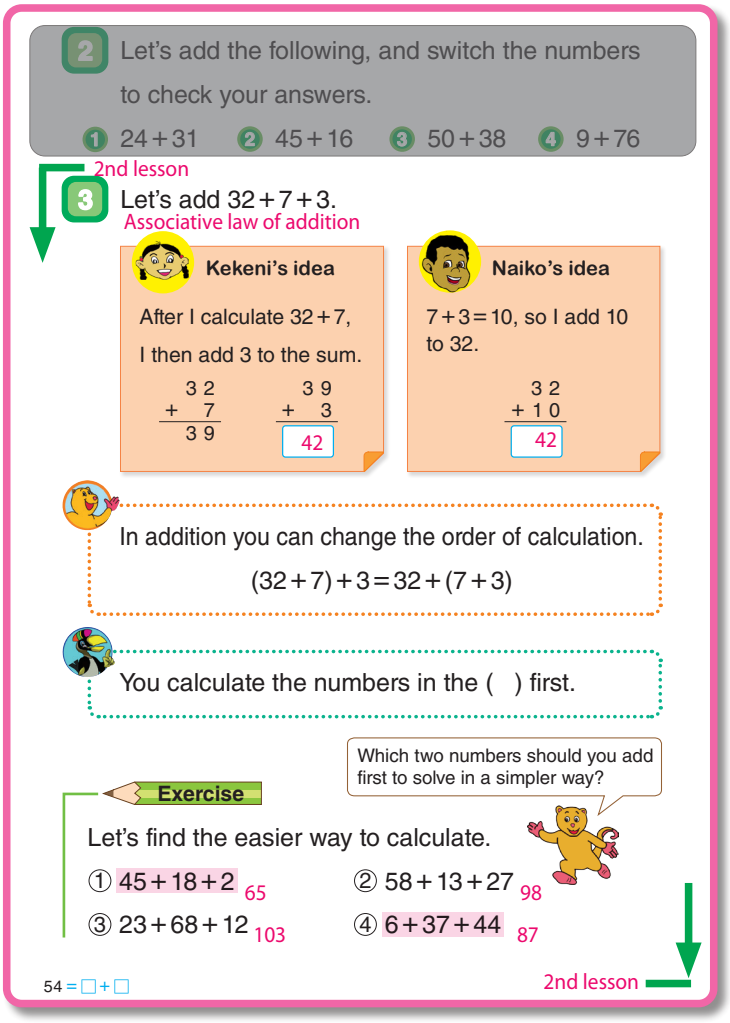
- Rules of addition lesson 10.

Preparation

- Ambai's Idea, Naiko's Idea and important point written on the chart.

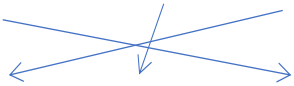
Assessment

- Add three numbers to get the same sum when the order of calculation is changed. F S



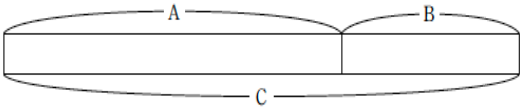
Teacher's Notes

Teaching Tips:
Relation between Addition and Subtraction
When we subtract addend from the sum, we get the augend.
(Augend) + (Addend) = (Sum)



(Sum) − (Addend) = (Augend)
12 + 35 = 35 → 35 − 23 = 12
By using the relation between addition and subtraction and doing 35 − 23, we can check whether our calculation, 12 + 23 = 35 is correct or not.

Bar diagram using a long tape
We can use a long tape to represent the given numbers and show the relations among the numbers in a bar diagram as below.



Making a diagram like this can help pupils understand the number relation by visualizing it, decide how to calculate, and examine their answer whether it is correct or not.

Lesson Flow

INTRODUCTION

1 Review.

T/P Review key ideas from the previous lesson.

BODY

2 Introduce the main task.

T Introduce and explain the main task, "Let's think about how to add three numbers when the order of calculation is changed to get the same sum

3 Think about how to solve 32 + 7 + 3.

T Let's add 32 + 7 + 3.

P Think, solve the task and present their ideas.

4 Kekeni's and Naiko's Ideas.

T/P Read and understand Kekeni's and Naiko's ideas.

T Explain Kekeni's and Naiko's ideas.

P Compare which idea is similar to their own.

P Understand that in addition of three numbers, the sum remains the same regardless of which numbers are added.

T/P Read and explain the important points in [ ] and [ ], then teacher explains.

P Learn about the use of brackets ( ) for numbers they want to calculate first.

TN Compare 39 + 3 and 32 + 10 and let pupils realise that 32 + 10 is easier to calculate than 39 + 3.

5 Exercise.

P Do the exercise.

T/P Correct the exercise.

TN Assist pupils to realise the following in each exercise;

① It is easier to calculate 18 + 2 = 20 first

② It is easier to calculate 13 + 27 = 40 first.

③ It is easier to calculate 68 + 12 = 80 first.

④ It is easier to calculate 6 + 44 = 50 first.

⑤ ①~③ they added the last two numbers together first and ④ they can add the numbers both ends to make the calculation simpler.

CONCLUSION

6 Summary.

T/P Summarise the lesson by confirming pupils' understanding of the main ideas in the lesson.

Sample Blackboard Plan

Date: **Chapter 4: Addition in Vertical Form** **Sub-chapter 4: Rules of Addition** **Lesson: 2 of 2**

Main Task: : Let's think about how to add three numbers when the order of calculation is changed to get the same sum.

Review

Review what we learnt yesterday:
When adding numbers, the sum remains the same even if the two numbers are switched.

Activities

3 Let's add 32 + 7 + 3.

32+7+3=42 (① 39 ②)

32+7+3=42 (① 10 ②)

Kekeni's idea
32+7=39
39+3=42
32+7+3=42 (①)

Naiko's idea
7+3=10
32+10=42
32+7+3=42 (①)

- Calculating in the order from the front
- We will not forget to add any number.

- Starting from the easy addition.
- We can calculate more easily.

In addition you can change the order of calculation.
(32+7) +3=32+ (7+3)

You calculate the numbers in the ( ) first.

Exercise

1. 45 + 18 + 2
18 + 2 = 20
45 + 20 = 65.

2. 58 + 13 +27
13 +27 = 40
58 + 40 = 98

3. 23 + 68 + 12
68 +12= 80
23 +80 = 103

4. 6 + 37 + 44
6 + 44 = 50
37 + 50 = 87

Summary

When adding numbers, the sum remain the same even if the calculation is changed.

Unit 4

Unit: Addition in Vertical Form
Exercise
Lesson 1 of 1

Textbook Page : p.55
Actual Lesson 033

Lesson Objective

- To deepen the understanding of what have been learnt.

Prior Knowledge

- Adding 2-digit numbers in vertical form.
- Adding 3-digit numbers in vertical form.

Preparation

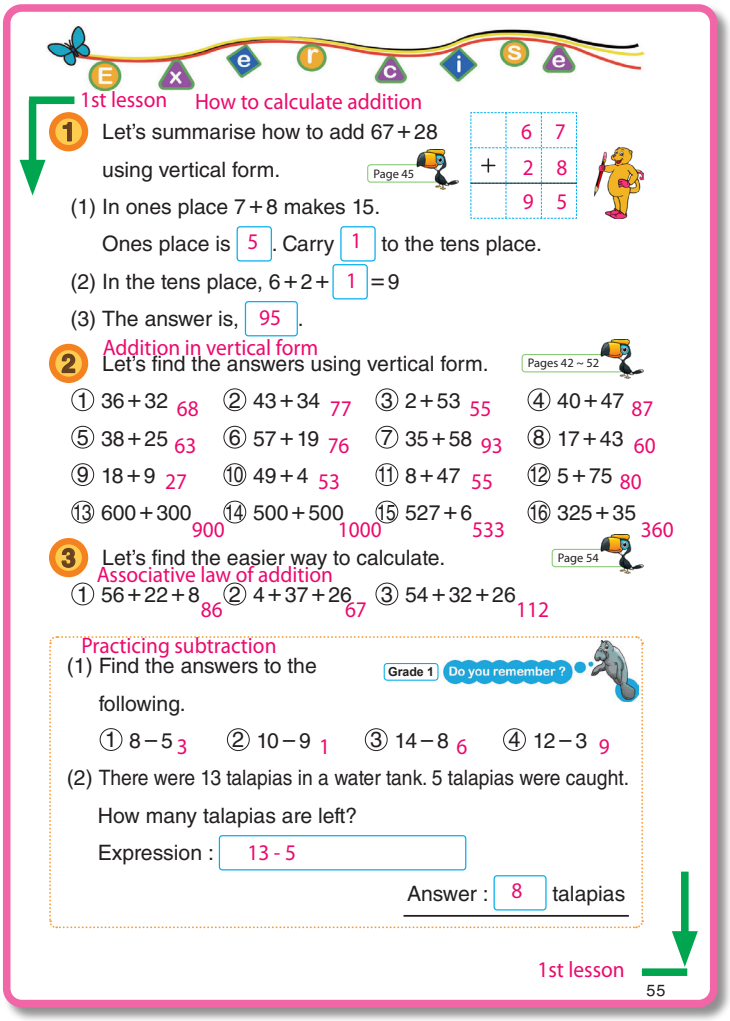
- Copy of exercise and problem sheet, exercise books and textbooks

Assessment

- Solve the exercises correctly by confirming what they have learned in adding 2-digit numbers and 3-digit numbers in vertical form. F S

Teacher's Notes

These exercises help pupils to; Summarise addition of (two-digit number) + (two-digit number) with carrying, master the calculations in vertical form and applying associative law where they have learnt.
The teacher may help those who have difficulties with supplementary exercise which the teacher can develop.



Exercise

1st lesson How to calculate addition

1 Let's summarise how to add 67 + 28 using vertical form. Page 45

	6	7
+	2	8
	9	5

(1) In ones place 7 + 8 makes 15.
Ones place is 5. Carry 1 to the tens place.
(2) In the tens place, 6 + 2 + 1 = 9
(3) The answer is, 95.

Addition in vertical form
2 Let's find the answers using vertical form. Pages 42 ~ 52

① 36 + 32 68 ② 43 + 34 77 ③ 2 + 53 55 ④ 40 + 47 87
⑤ 38 + 25 63 ⑥ 57 + 19 76 ⑦ 35 + 58 93 ⑧ 17 + 43 60
⑨ 18 + 9 27 ⑩ 49 + 4 53 ⑪ 8 + 47 55 ⑫ 5 + 75 80
⑬ 600 + 300 900 ⑭ 500 + 500 1000 ⑮ 527 + 6 533 ⑯ 325 + 35 360

3 Let's find the easier way to calculate. Page 54

Associative law of addition
① 56 + 22 + 8 86 ② 4 + 37 + 26 67 ③ 54 + 32 + 26 112

Practicing subtraction
(1) Find the answers to the following. Grade 1 Do you remember ?

① 8 − 5 3 ② 10 − 9 1 ③ 14 − 8 6 ④ 12 − 3 9

(2) There were 13 talapias in a water tank. 5 talapias were caught. How many talapias are left?
Expression : 13 - 5
Answer : 8 talapias

1st lesson

55

Lesson Flow

EXERCISE

① Summarise how to calculate addition (two-digit number) + (two-digit number) with carrying.

P Complete exercise ①.

② Master the calculations of (two-digit number) + (two-digit number and (three-digit number) + (three-digit number) in vertical form.

T Let's find the answers using vertical form.

P Master the calculations and complete the given exercises in ②.

TN Makes sure, when pupils calculate in vertical form, they are placing number in the same places in the same columns, and also that they do not forget carrying numbers.

TN The answers of the problems ⑧, ⑫ and ⑯ all have 0 in the ones places. While pupils are solving problems, Teacher should walk around the classroom and check each pupil is properly placing this 0 in the ones places.

③ Calculation of addition with three numbers by applying the associative law.

P Complete exercise in ③ by applying the associative law.

TN Help the pupils to understand the following in each exercise;

① Teacher has pupils realise that it is easier to calculate 22 + 8 = 30 first.

② Teacher has pupils realise that it is easier to calculate 4 + 26 = 30 first.

③ Teacher has pupils realise that it is easier to calculate 54 + 26 = 80 first.

Do you remember?

P Practice calculating subtraction.

Sample Blackboard Plan

Date: **Chapter 4: Addition in Vertical Form** **Problems** **Lesson: 1 of 1**

Exercise

① Summarise how to add 67 + 28.

① 7 + 8 makes 15 in ones place. Ones place is 5. Carry 1 to the tens place.
② In the tens place, 6 + 2 + 1 = 9.
③ The answer is, 95.

	6	7
+	2	8
	9	5

② Find the answers using vertical form.

① 36 + 32 68 ② 43 + 34 77 ③ 2 + 53 55 ④ 40 + 47 87
⑤ 38 + 25 63 ⑥ 57 + 19 76 ⑦ 35 + 58 93 ⑧ 17 + 43 60
⑨ 18 + 9 27 ⑩ 49 + 4 53 ⑪ 8 + 47 55 ⑫ 5 + 75 80
⑬ 600 + 300 900 ⑭ 500 + 500 1000 ⑮ 527 + 6 533 ⑯ 325 + 35 360

③ Find the easier way to calculate.

① 56 + 22 + 8 ② 4 + 37 + 26 ③ 54 + 32 + 26
56 + 30 = 86 37 + 30 = 67 80 + 32 = 112

(1) Find the answers to the following. Grade 1 Do you remember?

① 8 − 5 3 ② 10 − 9 1 ③ 14 − 8 6 ④ 12 − 3 9

(2) There were 13 talapia in a water tank. 5 talapia were caught. How many talapia are left?

Expression : 13 - 5

Answer : 8 talapia

Unit 4

Unit: Comparing Sizes
Problems 1 and 2
Lesson 1 of 1

Textbook Page : p.56~57
Actual Lesson 034

Lesson Objective

- To deepen the understanding of what have been learnt in this unit.

Prior Knowledge

- All the contents covered in this unit.

Preparation

- Copy of the problems in the textbook, exercise books and textbooks.

Assessment

- Solve the problems correctly by confirming what they have learned in this unit. S

Teacher's Notes

The problems are to do with addition in vertical form where teacher may evaluate pupils' understanding on aligning numbers correctly and vertically in columns, not forgetting to carry numbers where necessary and the carried number is added. The teacher may help those with such difficulties with supplementary problems to help better understanding.

Problems 1

1st lesson

Addition in vertical forms

1 Let's find the answers using vertical form.

① 14 + 63 77 ② 45 + 24 69 ③ 30 + 56 86 ④ 42 + 39 81

⑤ 36 + 47 83 ⑥ 19 + 65 84 ⑦ 22 + 18 40 ⑧ 54 + 16 70

⑨ 32 + 97 129 ⑩ 67 + 73 140 ⑪ 69 + 58 127 ⑫ 29 + 73 102

⑬ 400 + 300 700 ⑭ 900 + 100 1000 ⑮ 516 + 8 524 ⑯ 853 + 17 870

2 At Tina's school, there are two classes of grade 2.

Word problems where addition is used

There are 32 children in 2A class, and 28 children in 2B class.

How many children are there in grade 2 altogether?

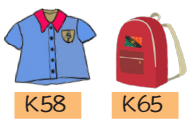
32 + 28 = 60 Answer: 60 children



Word problems where addition is used

3 If you buy a school uniform for 58 kina and a backpack for 65 kina, what will be the total cost?

58 + 65 = 123
Answer: 123 kina



4 Let's find the mistakes in the following.

Correct way of calculating in vertical forms and write the correct answers in the ( ).

Tell me!



① 27 + 43 = 60 (70) Carried number is not added.

② 81 + 58 = 149 (139) 1 ten is added to the tens place where there is no carried number indeed.

③ 6 + 35 = 95 (41) A number 6 is written in the wrong column.

④ 12 + 19 = 211 (31) Calculation in the tens place is not correct.

Problems 2

Correct understanding the context given in the problem.

1 Lyn made paper birds on Friday, Saturday, and Sunday.



① If Lyn made 24 paper birds on Friday, solve the following questions.

(1) How many did she make on Saturday? 24 + 39 = 63 Answer: 63 paper birds

(2) How many did she make on Sunday? 63 + 87 = 150 Answer: 150 paper birds

② Elijah wrote the following expression.

39 + 87

What is Elijah trying to find out? Explain.

(Example)
He is trying to find out how many more birds Lyn made on Sunday than the number of birds she made on Friday.

1st lesson

Lesson Flow

PROBLEMS 1

1 Calculate addition in vertical forms.

P Calculate addition in vertical form.

TN Advise pupils to pay careful attention to write numbers in the same places in the same columns, and not to forget carrying numbers where necessary.
In the problem ⑫ 29 + 73, when the numbers in the ones place are added, it is 9 + 3 = 12, and 1 ten has to be carried to the tens place. As a result, the tens place becomes 2 + 7 + 1 = 10, and 1 hundred (10 ten) has to be carried to the hundreds place.

TN Advise pupils to be extra careful of the calculations which include three-digit numbers.

2 Solve the word problem where addition is applied.

P Read, understand and solve the word problem where addition is applied.

3 Solve the word problem where addition is applied.

P Read, understand and solve the word problem where addition is applied.

TN Advise pupils to first think about the context of the presented word problems, make math expressions and calculate to find the answers.

4 Identify mistakes in the presented calculations in vertical form and correct them.

P Identify the mistakes and write the correct answer.

TN Advise pupils to identify whether the mistakes result from incorrect calculations or from placing numbers in the wrong columns. Problem ① is wrong because the carried number 1 is not added to the tens place. Problem ② is wrong because 1 ten is carried to the tens place although it is not necessary. Problem ③ is wrong because a number 6 is mistakenly written in the column for the tens place instead of the ones place, and is added by mistake.
Problem ④ is wrong because the carried number 1 to the tens place is not properly added to the original two numbers 1 + 1 in the tens place, and moreover the answer is not written in the right column.

PROBLEMS 2

1 Solve the word problem.

P Read, understand and solve the word problem ① and ②.

Sample Blackboard Plan

Date: **Chapter 4: Addition in Vertical Form** **Problems** **Lesson: 1 of 1**

Problems 1

1 Let's find the answers using vertical form.

① 14 + 63 77 ② 45 + 24 69 ③ 30 + 56 86 ④ 42 + 39 81
⑤ 36 + 47 83 ⑥ 19 + 65 84 ⑦ 22 + 18 40 ⑧ 54 + 16 70
⑨ 32 + 97 129 ⑩ 67 + 73 140 ⑪ 69 + 58 127 ⑫ 29 + 73 102
⑬ 400 + 300 700 ⑭ 900 + 100 1000 ⑮ 516 + 8 524 ⑯ 853 + 17 870

2 How many children are there altogether?



32 + 28 = 60 Answer: 60 children

```
  3 2
+ 2 8
-----
  6 0
```

3 What will be the total cost of the backpack and uniform?



58 + 65 = 123
Answer: 123 kina

```
  5 8
+ 6 5
-----
1 2 3
```

4 ① 27 + 43 = 60 (70) ② 81 + 58 = 149 (139) ③ 6 + 35 = 95 (41) ④ 12 + 19 = 211 (31)

Problems 2

1



① If Lyn made 24 paper birds on Friday, solve the following questions.
(1) How many did she make on Saturday? 24 + 39 = 63
Answer: 63 paper birds

```
  2 4
+ 3 9
-----
  6 3
```

(2) How many did she make on Sunday? 63 + 87 = 150
Answer: 150 paper birds

```
  6 3
+ 8 7
-----
1 5 0
```

② Elijah wrote the expression 39 + 87. What is he trying to find out?
Example: He is trying to find out how many more birds Lyn made on Sunday than on Friday.

End of Chapter Test: Chapter 4 **Date:**

Evaluation: Chapter 4 Addition in Vertical Form	Name:	Score /100

1. Let's find the answers using vertical form. [10 points for each question]

(1) 41 + 35

(2) 34 + 3

(3) 27 + 65

(4) 48 + 32

(5) 57+84

(6) 300 + 400

(7) 443 + 38

(8) 379 + 248

2. Make a math sentence and find the answer.

[5 points for math sentence and 5 points for answer]

(1) There are 36 picture books and 29 reference books in a classroom. How many books are there altogether?

Math sentence _____ Answer _____

(2) Emily had 123 kina. Her mother gave her 149 kina. How many kina does she have now?

Math sentence _____ Answer _____

Chapter 5 Subtraction in Vertical Form

1. Unit Objectives

- To deepen the understanding of subtraction, and extend the ability to use the calculations.
- To explore ways of subtraction of two-digit numbers as the inverse operation of addition, to understand that these calculations are based on the basic calculations of one-digit numbers, and to do these calculations accurately.
- To understand how to calculate subtraction in vertical forms.
- To explore how to calculate simple addition of three-digit numbers.
- To develop one's understanding of the form and logic of subtraction and to apply that knowledge to further exploring various ways of subtraction calculations and checking answers.
- To understand the mutual relationships between addition and subtraction and explain them by using algebraic expressions.

2. Teaching Overview

In this unit, based on what pupils learned in grade 1, they will deepen their understanding of the use of subtraction and will recall the previously learned addition in vertical form. The main aim is to understand how to do subtraction in vertical form in connection with the base 10 place value system.

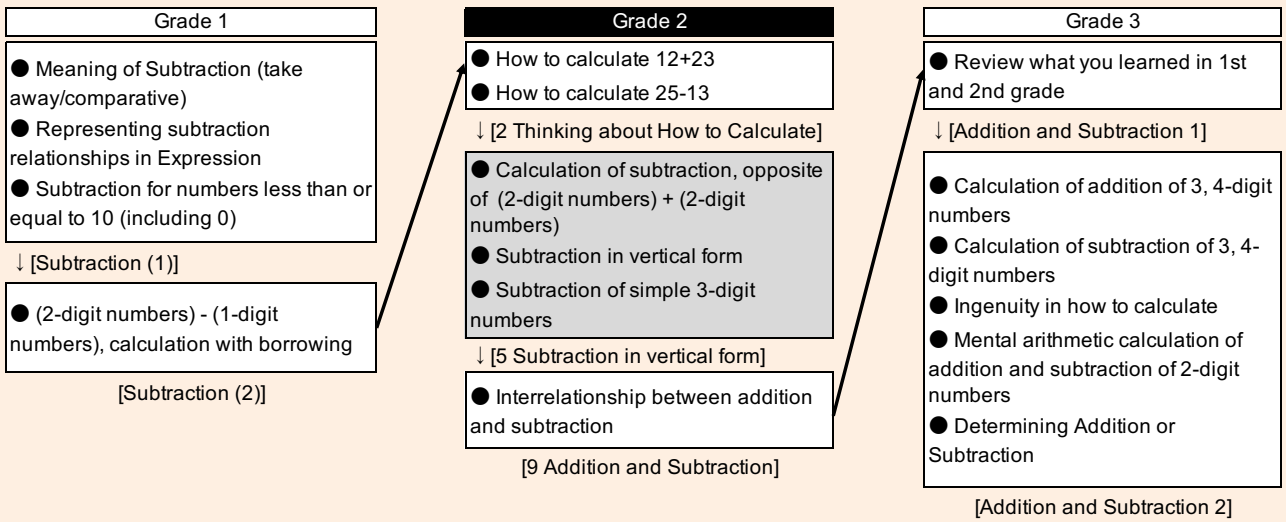
Subtraction of 2-digit Numbers, Subtracting from Numbers That Are Larger than 100, Subtraction of 3-digit Numbers: Pupils understand the subtraction from word problem, and think about how to do calculations in vertical form as a task. Then, let pupils think about how to do subtraction in vertical form, based on what they have already learned in addition, by aligning the places, and by calculating with the same place value. At this time, it is important to use blocks, etc., to engage in mathematical activities that relate the notation of the vertical form to the manipulation activities.

Relation between Addition and Subtraction: Use tape diagram to help pupils realise that subtraction is the inverse of addition, and that addition can be used to check subtraction.

What Kind of Calculation Is This?: Pupils determine addition or subtraction, through the activity of making tape diagram from word problems and pictures.

Key Concepts: Subtraction of 2-digit and 3-digit numbers in vertical form.

3. Related Learning Contents



Unit 5

Unit: Subtraction in Vertical Form
Sub-unit: 1. Subtraction of 2-digit Numbers
Lesson 1 of 4

Textbook Page : p.58~59
Actual Lesson 035

Sub-unit Objectives

- To understand the context of the given problems as well as the use of subtraction in solving the problem, and to think of how to calculate subtraction through manipulation of mathematics blocks.
- Understand the way of calculating subtraction that is (decade number) – (two-digit number) or that has one-digit number as a difference.
- Calculate (two-digit number) – (one-digit number) in vertical form.

Lesson Objectives

- Make math sentences for situations where subtraction is used, and think of how to calculate subtraction of two-digit numbers without borrowing.
- Understand how to calculate subtraction without borrowing in vertical form; (two-digit number) – (two-digit number) and (two-digit number) – (one-digit number).

Prior Knowledge

- Addition in vertical form

Preparation

- Mathematics blocks, place value chart, digital textbook software (if available)

Assessment

- Calculate subtraction of two-digit numbers without borrowing correctly. F S
- Calculate subtraction of two-digit numbers without borrowing in vertical form correctly. F S

Teacher's Notes

The key idea in identifying how to calculate the expression 38 – 12 is to ensure that the students identify:

- Situations where subtraction is used.
- How to calculate subtraction of two-digit numbers without borrowing.

5 Subtraction in Vertical Form

1st lesson

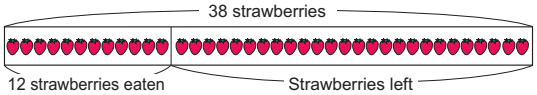




How to calculate subtraction (two digit number) - (two digit number) without borrowing and how to calculate subtraction in vertical form

Subtraction of 2-digit Numbers

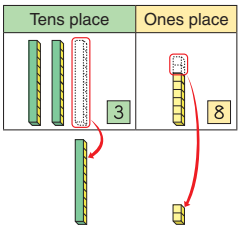
1 Sam and his friends picked 38 strawberries. They ate 12 of them. How many are left?

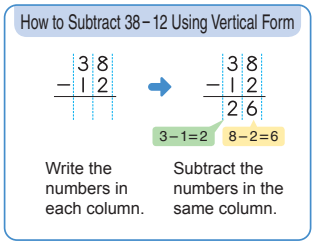


1 Write an expression. 38 - 12

2 Let's think about how to subtract with the vertical form, just as with addition.

	3	8
–	1	2
	2	6





How to calculate (two digit number) - (one digit number) in vertical form

2 Subtract 29 – 6 using vertical form.

	2	9
–		6
	2	3



3 Let's think about how to find answers for the following using vertical form.

How to calculate (two digit number) - (one/two digit number) in vertical form

1 34 – 14

	3	4
–	1	4
	2	0

2 68 – 64

	6	8
–	6	4
		4

3 48 – 8

	4	8
–		8
	4	0



Exercise

Let's find the answers using vertical form.

① 76 – 32 44
② 59 – 45 14
③ 36 – 24 12
④ 56 – 40 16
⑤ 58 – 5 53
⑥ 98 – 18 80
⑦ 43 – 42 1
⑧ 30 – 20 10
⑨ 45 – 5 40

1st lesson

58 = □ + □

□ – □ = 59

Lesson Flow

INTRODUCTION

1 Pre-discussion on the picture or situation.

T/P Discuss what they see in the picture and situation about subtraction.

BODY

2 Introduce the main task.

T Introduce and explain the main task, Let's think of how to calculate 38 – 12.

3 ① Read and understand the situation.

T/P Think of what kind of math expression can be made from the situation using the tape diagram.

T ① Ask students to write the math expression for the story in which there were 38 strawberries and that 12 of them were eaten.

P Write the expression 38 – 12 and discuss how to subtract in vertical form.

T ② Let's think about how to subtract in vertical form using the idea of vertical addition.

P Move the mathematics blocks to realise that the strawberries are decreasing.

P Think about how to calculate 38 – 12.

T Use the box on "How to calculate 38 – 12 Using vertical from" to explain to pupils.

P Write the numbers in the same place value columns and subtract them.

P 8 – 2 gives 6 ones, and 3 – 1 gives 2 sets of ten. Therefore, the answer is 26.

4 ② How to calculate 29 – 6 in vertical form.

P Calculate 29 – 6 in vertical form.

TN Facilitate the presentation of pupils sharing their ideas on how to calculate 29 – 6.

T Confirm answer and how to calculate using the vertical form.

5 ③ How to find the answer when subtracting in vertical form.

T Let's think about how to find the answers for activities ①, ②, ③ using vertical form.

P Solve activities ①, ②, ③ and present their answers to the class.

T/P Confirm pupils' answers.

6 Exercise.

P Do the exercise.

T/P Correct the exercise.

CONCLUSION

7 Summary.

T/P Summarise the lesson by confirming pupils' understanding of the main ideas in the lesson.

Sample Blackboard Plan

Date: **Chapter 5**: Subtraction in Vertical Form **Sub-chapter 1:** Subtraction of 2-digit Numbers **Lesson** 1 of 4

Main Task: Let's think of how to calculate 38 - 12.

Review

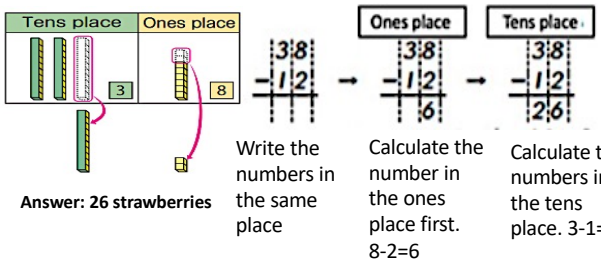
1 Sam and his friends picked 38 strawberries. They ate 12 of them. How many are left?

① Write an expression.

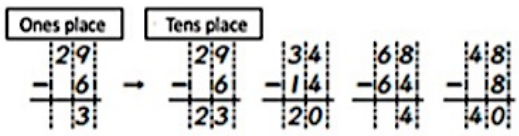
38 - 12

Activities

② How to calculate 38 – 12 in vertical form.



2 Subtract 29 – 6 using vertical form.



3 Find answers for the following using vertical form.

① 34 - 14 ② 68 - 64 ③ 48 -8

Exercise

① 76 – 32 ④ 56 – 40
⑤ 58 – 5 ⑥ 98 – 18
⑦ 43 – 42 ⑧ 30 – 20
⑨ 45 – 5

Summary

- Subtraction of (2-digit number) – (2-digit number) in vertical form without borrowing.

Unit 5

Unit: Subtraction in Vertical Form
Sub-unit: 1. Subtraction of 2-digit Numbers
Lesson 2 of 4

Textbook Page : p.60~61
Actual Lesson 036

Lesson Objective
- Think of how to calculate subtraction of (two-digit) – (two-digit) numbers with borrowing in vertical form.

Prior Knowledge
- Addition in vertical from.

Preparation
- Mathematics blocks, place value chart, digital textbook software (if available).

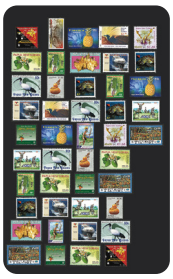
Assessment
- Calculate subtraction of (two-digit) – (two-digit) numbers with borrowing in vertical form. F S

Teacher's Notes
During lessons, Teacher should pay careful attention to individuals and recognise which pupils are calculating from the tens place so that Teacher can observe their progress as well as struggles during lessons and provide appropriate and timely support where needed. Lessons should effectively involve pupils in active minds-on problem-solving activities. Teacher should focus on borrowing from 10s place using the vertical form.

2nd lesson

4 There were 45 postage stamps. I used 27 of them. How many are left?

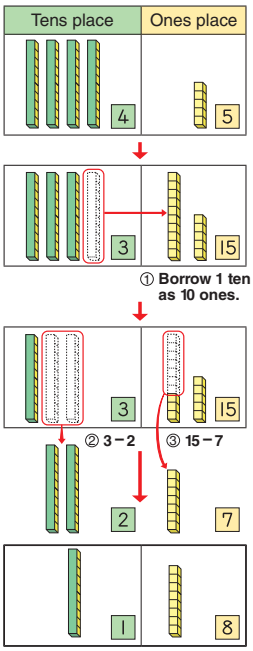
How to calculate subtraction (two digit number) - (two digit number) with borrowing and how to calculate subtraction in vertical form

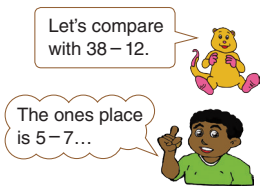


① Write an expression.

45 - 27

② Let's think about how to calculate.



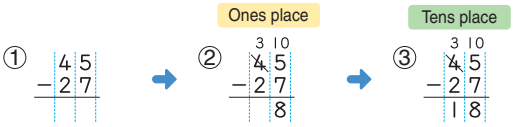


As shown on the left, you can move 1 from the tens place to the ones place as 10 ones. This is called **borrowing**.

③ Let's think about how to find the answer using vertical form.

	3	10
	4	5
–	2	7
	1	8

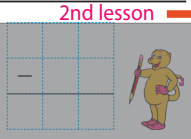
How to Subtract 45 – 27 Using Vertical Form



Math sentence : 45 – 27 = 18 Answer : 18 postage stamps

2nd lesson

5 Let's find the answer for 53 – 26 using vertical form.



6 Let's think about how to subtract using vertical form.

① 70 – 23

	7	0
–	2	3

How should I subtract the ones place?

② 34 – 26

	3	4
–	2	6

What would the answer in the tens place be?

Exercise

Let's find the answers using vertical form.

① 41 – 19	② 72 – 33	③ 81 – 16	④ 66 – 28
⑤ 70 – 56	⑥ 40 – 24	⑦ 50 – 33	⑧ 80 – 48
⑨ 26 – 18	⑩ 54 – 45	⑪ 73 – 67	⑫ 90 – 88

60 = □ + □

□ – □ = 61

Lesson Flow

INTRODUCTION

1 Review.

T/P Review key ideas from the previous lesson.

BODY

2 Introduce the main task.

T Introduce and explain the main task, "Think of how to subtract with borrowing in vertical form".

3 4 Read and understand the situation.

T/P Read and understand the given situation.

P ① Understand the context and make a math expression, 45 – 27.

TN Explain to the pupils who cannot quickly identify the problem with the use of subtraction, advise them to take small steps by first imagining well the given situation, clarifying what they have to find out, and identifying what they already know from the problem.

4 How to calculate 45 – 27.

T ② Let's think about how to calculate 45 – 27 in vertical form and advise pupils to consider Kapuls' concern.

P Think about how to calculate 45 – 27.

T Advice pupils to open the textbook and manipulate the blocks based on the calculation process.

TN When borrowing 1 ten from the tens place, pupils should recognise that a set of 10 is moved to the ones place and has to be broken into ones in other words the operation of moving 1 from the tens place as 10 ones is called 'borrowing".

T/P Read together the important point in the [ ] and the teacher explains.

5 Calculate 45 – 27 in vertical form

T ③ Let's think about how to find the answer using vertical form.

P Calculate by subtracting the numbers in the ones place.

TN Ask pupils to present their ideas.
During their presentation, acknowledge various ideas that are different and unique.

T Confirm pupils' calculation.

TN By referring to the explanation (2) in the box "How to Subtract 45 – 27 Using Vertical Form", Teacher advises pupils to cross the number 4 in the tens place and write 3 instead so that they remember they borrowed 1 ten from the tens place.

CONCLUSION

6 Summary.

T/P Summarise the lesson by confirming pupils' understanding of the main ideas in the lesson.

Sample Blackboard Plan

Date: **Chapter 5**: Subtraction in Vertical Form **Sub-chapter 1:** Subtraction of 2-digit Numbers **Lesson** 2 of 4

Main Task: Let's think of how to subtract with borrowing in vertical form.

Review

Calculate 34 – 14 in vertical form.

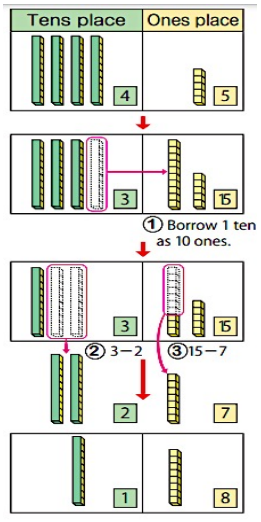


Activities

4 There were 45 postage stamps. I used 27 of them. How many are left?

① Write an expression.
45 – 27

② Let's think about how to calculate.



Vertical Form

$$\begin{array}{r} 45 \\ -\ 27 \\ \hline \end{array}$$

We cannot do 5 – 7 in the ones place. Let's borrow 1 ten (10 ones) from the tens place, and calculate 15 – 7.

Important Point

As shown on the left, you can move 1 from the tens place to the ones place as 10 ones. This is called borrowing.

③ Think about how to find the answer for 45 – 27 using vertical

$$\begin{array}{r} 45 \\ -27 \\ \hline \end{array}$$

Write the numbers in the same places in the same columns.

$$\begin{array}{r} {}^{3}\not{4}\,{}^{10}5 \\ -\ 2\ 7 \\ \hline 8 \end{array}$$

Borrow 1 ten as 10 ones from the tens place. 15 – 7 = 8

$$\begin{array}{r} {}^{3}\not{4}\,{}^{10}5 \\ -\ 2\ 7 \\ \hline 1\ 8 \end{array}$$

1 ten has been borrowed to the ones place, so 3 – 2 = 1.

	3	10
	4	5
–	2	7
	1	8

Answer : 1 8 postage stamps

Summary

- Subtraction of (two-digit) – (two-digit) numbers with borrowing in the vertical form.

Unit 5

Unit: Subtraction in Vertical Form
Sub-unit: 1. Subtraction of 2-digit Numbers
Lesson 3 of 4

Textbook Page : p.61
Actual Lesson 037

Lesson Objectives

- Practice calculating (two-digit number) – (two-digit number) with borrowing in vertical form.
- Think how to calculate subtraction that is (decade number) – (two-digit number) or that has one-digit number as a difference.

Prior Knowledge

- Subtraction of (two-digit) – (two-digit) numbers without borrowing.

Preparation

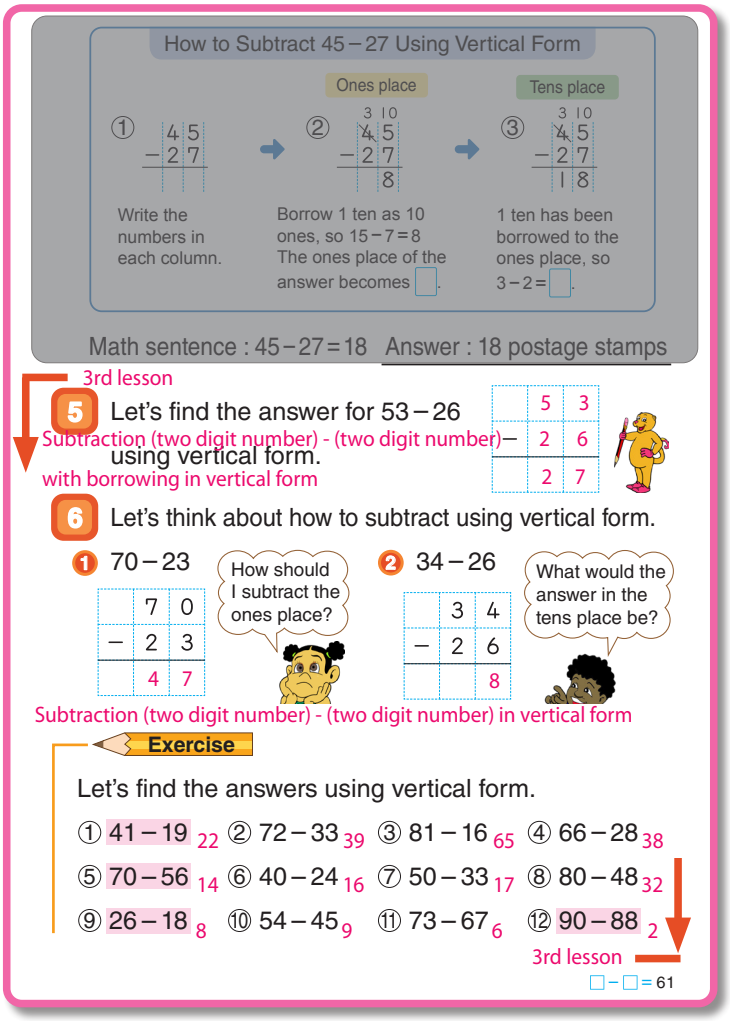
- Mathematics blocks, place value chart, digital textbook software (if available)

Assessment

- Calculate (two-digit number) – (two-digit number) with borrowing in vertical form correctly. F S
- Calculate subtraction that is (decade number) – (two-digit number) or has one-digit number as a difference. F S

Teacher's Notes

Use of Auxiliary In subtraction
We use auxiliary figures more often than we do in addition. This textbook uses auxiliary figures consistently in the beginning pages but gradually reduces the usage.
The ultimate goal is that pupils can calculate without auxiliary figures. However, in order to prevent mistakes in complicated calculations, this textbook maintains auxiliary figures where necessary, and tries to reduce the usage gradually.
With regard to stopping the use of auxiliary figures, Teacher should determine an appropriate time for each pupil based on his/her understanding level. For pupils who keep making mistakes, Teacher should not force them to stop using the auxiliary figures, but wait until they fully master the calculations.
Note!
Decade Numbers are the numbers counted when counting by tens to hundred. Eg.
10, 20, 30, 40, ……100.



Lesson Flow

INTRODUCTION

1 Review.

T/P Review key ideas from the previous lesson.

BODY

2 Introduce the main task.

T Introduce and explain the main task, "Let's think of how to calculate (two digit) – (two digit) numbers with borrowing."

3 5 How to solve 53 – 26.

T Let's think about how to solve 53 – 26 in vertical form.

P Solve the problem by using the steps of calculating in vertical form.

TN Remind pupils of how they used vertical form in the previous lesson and get them to write the problem in vertical form in their textbooks. Check the answer with pupils to assess that they are properly following the calculation rules.

T Confirms the understanding.

4 6 Subtracting (decade number) – (two-digit number).

T/P Read and understand the problem.

TN Explain the meaning of decade numbers as numbers counted when counting by tens to hundred. Eg. 10, 20, 30, 40, ...100.

T ❶ Get the pupils to think of how to calculate 70 – 23 in vertical form.

P Work individually to solve the problems.

TN In problem ❶, make sure that for the ones place, they should borrow 1 ten from the tens place to have 10 – 3.

T ❷ Get the pupils to think of how to calculate 34 – 26 in vertical form.

P Work individually to solve the problems

TN In problem ❷, make sure that because of borrowing 1 ten from the tens place to the ones place, calculation in the tens place becomes 2 – 2 = 0. Emphasise that this 0 in the tens place should not be written.

T/P Confirm the answers.

5 Exercise.

P Do the exercise.

T/P Correct the exercise.

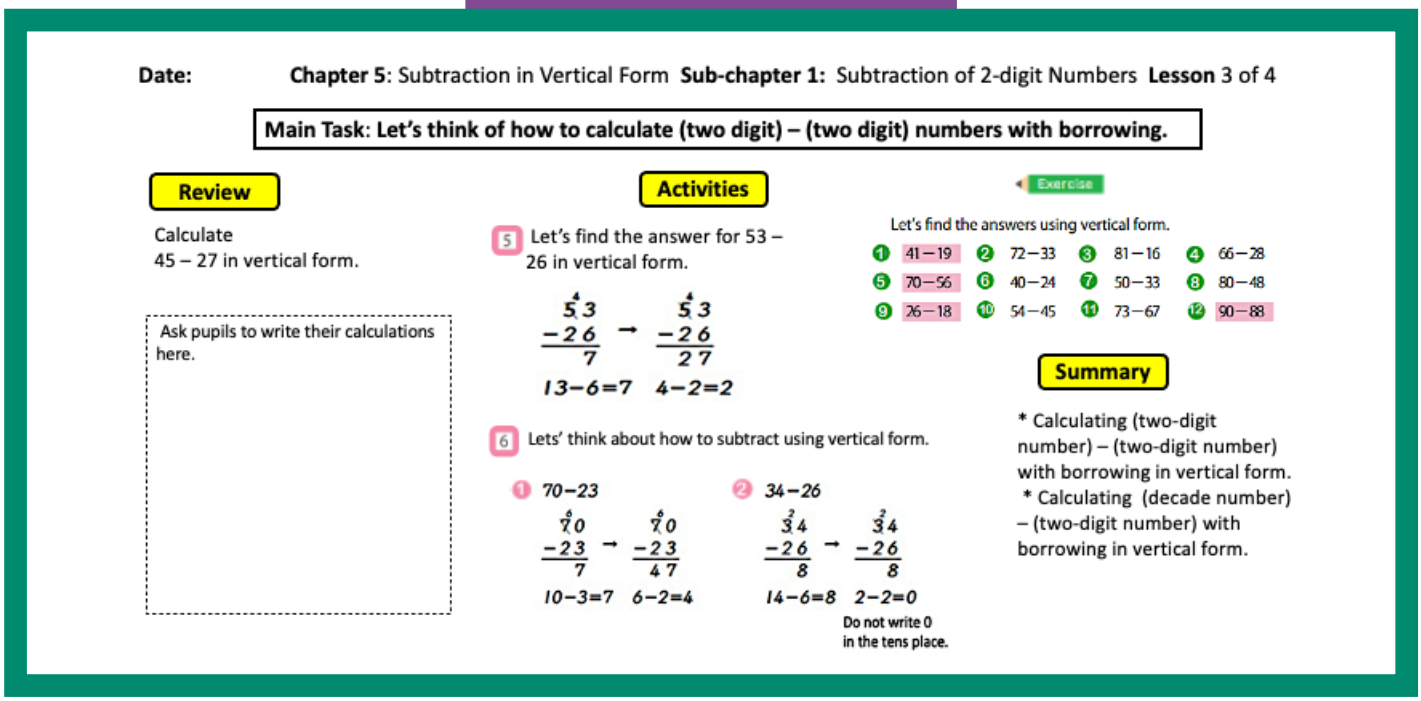
TN The first four questions from ① to ④ are to practice calculating (two-digit number) – (two-digit number) with carrying.
The next four questions from ⑤ to ⑧ are to practice calculating (decade number) – (two-digit number).
The last four questions from ⑨ to ⑫ are to practice calculating subtraction where the answer is a one-digit number.

CONCLUSION

6 Summary.

T/P Summarise the lesson by confirming pupils' understanding of the main ideas in the lesson.

Sample Blackboard Plan



Unit 5

Unit: Subtraction in Vertical Form
Sub-unit: 1. Subtraction of 2-digit Numbers
Lesson 4 of 4

Textbook Page : p.62
Actual Lesson 038

Lesson Objective

- Think of how to calculate subtraction with borrowing in vertical form; (two-digit number) – (one-digit number).

Prior Knowledge

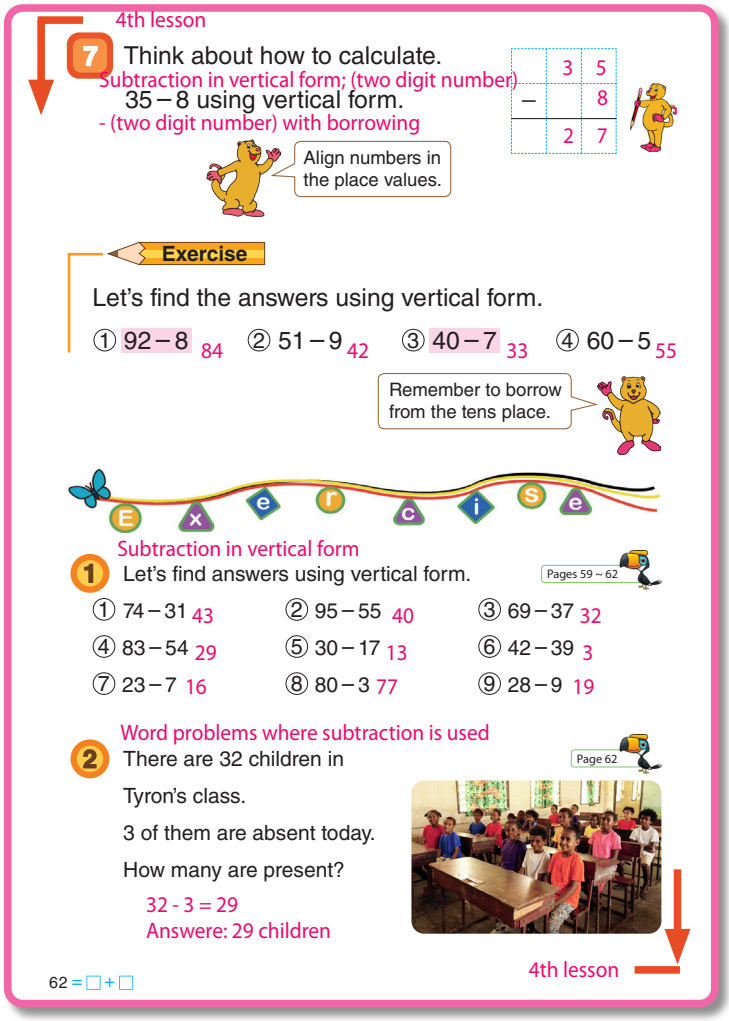
- Calculating (two-digit number) – (two-digit number) with borrowing in vertical form.

Preparation

- Mathematics blocks, place value chart, digital textbook software (if available)

Assessment

- Calculate subtraction of (two-digit number) – (one-digit number) with borrowing in vertical form correctly. F S



Teacher's Notes

Teaching Tips: Moving away from the Block Manipulation.

In learning (two-digit number) – (two/one-digit number), the manipulation of the mathematics blocks can enable pupils to link the place values represented with the blocks and actual numbers appearing in vertical form.

It is effective for pupils to acquire the visualised image of calculations they are dealing with. However, as pupils become used to calculations, some of them may start to find it unnecessary to use the blocks every time. With such pupils, it is a good implication of moving away from the use of the blocks. It is high time they directly jumped into calculations by looking at numbers given.

As the manipulation of the blocks is only a method to understand algorisms of calculations with the help of concrete objects, it is better that pupils can move away from the use of the blocks at an early stage.

Lesson Flow

INTRODUCTION

1 Review.

T/P Review key ideas from the previous lesson.

BODY

2 Introduce the main task.

T Introduce and explain the main task "Let's think of how to calculate (two-digit number) – (one-digit number)

3 [7] Think about how to calculate 35 – 8.

T Tell pupils to close the textbooks first and copy the problem 35 – 8 into their exercise books from the blackboard. Here, Teacher tells them to write it in vertical form.

T Let's think about how to calculate in vertical form.

P Think and understand how to write 35 – 8 in vertical form and calculate.

T Ask pupils to think which is correct, (A) or (B).

(A) 3 5 − 8

(B) 3 5 − 8

T/P Confirm that (B) is the correct and explain why (A) is not correct.

T Get the pupils to use the table in the textbook to calculate 35 – 8 in vertical form.

P Calculate 35 – 8 in vertical form and solve the problem.

T/P Confirm that the answer is 27.

4 Exercise.

P Do the exercise

T/P Correct the exercise.

TN For the problems 40 – 7 and 60 – 5, Teacher makes sure pupils properly understand that in each case, the ones place needs to borrow 1 ten (10 ones) from the tens place and to be solved by doing 10 – 7 and 10 – 5.

CONCLUSION

5 Summary.

T/P Summarise the lesson by confirming pupils' understanding of the main ideas in the lesson.

EXERCISE

P ① Do the exercise

TN Pupils can solve the problems using vertical form. Advise pupils to write numbers in the same place value columns and remember to borrow from the tens places.

② Pupils solve the word problem where subtraction is applied by first making a math expression and calculate to find the answer.

Sample Blackboard Plan

Date: **Chapter 5**: Subtraction in Vertical Form **Sub-chapter 1:** Subtraction of 2-digit Numbers **Lesson** 4 of 4

Main Task: : Let's think of how to calculate (two-digit number) – (one-digit number) .

Review

* Calculating (two-digit number) – (two-digit number) with borrowing in vertical form.
* Calculating (decade number) – (two-digit number) with borrowing in vertical form.

Activities

[7] Think about how to subtract 35 – 8 in vertical form.

Let's write in vertical form.

(A) 35 − 8 (B) 35 − 8

Which is correct? 8 is a one digit number. It should be written under 5 in the ones column.

Let's solve it.

35 − 8 = 27

Write 2 in the tens place after borrowing 1 ten from the original 3.

Exercise

Let's find the answers using vertical form.

① 92 − 8 ② 51 − 9 ③ 40 − 7 ④ 60 − 5

Exercise

① Let's find answers using vertical form.

① 74 − 31 ② 95 − 55 ③ 69 − 37
④ 83 − 54 ⑤ 30 − 17 ⑥ 42 − 39
⑦ 23 − 7 ⑧ 80 − 3 ⑨ 28 − 9

② Let's solve in the order of (expression) → (vertical form) → (answer).

32 − 3 = 29

Answer 29 children

32 − 3 = 29

Summary

- Calculating (two-digit number) — (one-digit number) in vertical form with borrowing.

Unit 5

Unit: Subtraction in Vertical Form

Sub-unit: 2. Subtracting from Numbers that are Larger than 100

Lesson 1 of 3

Textbook Page : p.63
Actual Lesson 039

Sub-unit Objective

- To understand how to use vertical form in calculating subtraction whose minuend is larger than 100.

Lesson Objective

- Think of how to calculate subtraction with borrowing 1 hundred from the hundreds place (three digit number starting with 100) – (two digit number).

Prior Knowledge

- Calculating (two-digit number) – (one-digit number) in vertical form.

Preparation

- Mathematics blocks, place value chart, digital textbook software (if available)

Assessment

- Subtract (three-digit number starting with 100) – (two-digit number) with borrowing correctly. F S

Teacher's Notes

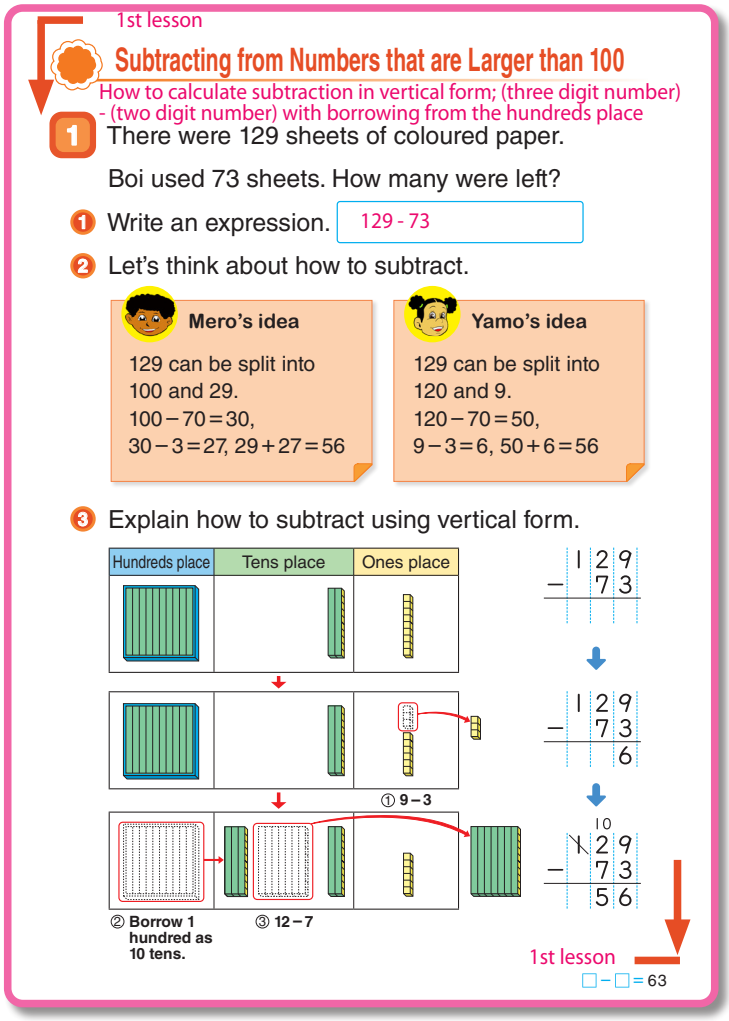
Teaching Tips: Preparation of Posting Charts for Teaching Vertical Form (1).

1 Place Value Charts

There are various ways that Teacher can devise the use of charts during lesson.

For example, in using place value charts in lessons, Teacher can prepare two types of tables as below. The first chart has the descriptions of "hundreds place" "tens place" and "ones place" on top. The second chart has only three empty columns without such descriptions. Teacher can use either type according to an activity. The lines should be dark and thick enough for pupils to see.

	Hundreds Place	Tens Place	Ones Place
With Descriptions			
Without Descriptions			



Lesson Flow

INTRODUCTION

1 Review.

T/P Review key ideas from the previous lesson.

BODY

2 Introduce the main task.

T Introduce and explain the main task, 'Let's think about how to calculate 129 – 73.'

3 ① Read and understand the problem.

T/P Read and understand the problem of 129 – 73.

P Recognise that in this lesson they are looking at a way of subtracting from a number larger than 100.

T Ask "How many sheets of paper were left?" and get pupils to write an expression to represent the problem.

P ① Write the expression 129 – 73.

4 Think about how to calculate 129 – 73, and solve the problem.

P ② Think about how to solve this problem.

TN If pupils don't have any ideas, they can look at Mero's and Yamo's ideas.

T Have pupils realise that in the tens place they cannot subtract 7 from 2 as it is.

T How can we solve this problem?

P Identify how the problem can be solved and present their ideas to their friends.

5 Mero's and Yamo's Ideas.

T Explain Mero's and Yamo's ideas.

TN Pupils can go over the ideas from Mero's and Yamo's as shown on P.63 and discuss similar points and different points from their own.

6 Calculating (3-digit numbers) – (2-digit numbers) with borrowing in vertical form.

T ③ Explain how to subtract using vertical form using blocks or charts.

P Solve it by using vertical form, blocks or charts, but Teacher should check with the entire class the use of vertical form in this problem.

TN Emphasise the steps in borrowing from hundreds to the tens place.

CONCLUSION

7 Summary.

T/P Summarise the lesson by confirming pupils' understanding of the main ideas in the lesson.

Sample Blackboard Plan

Date: **Chapter 5**: Subtraction in Vertical Form **Sub-chapter 2:** Subtracting from Numbers that are Larger than 100 **Lesson** 1 of 3

Main Task: Let's think about how to calculate 129 - 73.

Review

[4]There were 45 postage stamps. I used 27 of them. How many are left?

1. What kind of problem is this?
2. Write an expression and solve.

Activities

1 There were 129 sheets of coloured paper.

Boi used 73 sheets. How many are left?

① Write an expression. 129 - 73

② Let's think about how to subtract.

PUPILS' IDEAS WRITE THEM HERE.

Mero's idea

129 can be split into 100 and 29.

100−70=30,

30−3=27, 29+27=56

Yamo's idea

129 can be split into 120 and 9.

120−70=50,

9−3=6, 50+6=56

③ **How to Calculate in Vertical Form.**

$$\begin{array}{r} 129 \\ -\ 73 \\ \hline \end{array}$$

Write the numbers in their correct place values.

$$\begin{array}{r} 129 \\ -\ 73 \\ \hline 6 \end{array}$$

9 - 3 is 6

$$\begin{array}{r} {}^{10} \\ 1\not{2}9 \\ -\ 73 \\ \hline 56 \end{array}$$

Borrow 1 hundred as 10 tens.
12 - 7 is 5

Summary

- Three-digit number starting with 100 – two-digit number with borrowing.
- Borrow 1 hundred as 10 tens from hundreds place.

Unit 5

Unit: Subtraction in Vertical Form

Sub-unit: 2. Subtracting from Numbers that are Larger than 100

Lesson 2 of 3

Textbook Page : p.64
Actual Lesson 040

Sub-unit Objectives

- To understand how to use vertical form in calculating subtraction whose minuend is larger than 100.

Lesson Objectives

- Solving (three-digit number starting with 100) – (two-digit number).
- Think about how to calculate the subtraction with borrowing from the hundreds place and tens place.

Prior Knowledge

- Subtraction of two digit numbers.

Preparation

- Mathematics blocks, place value chart, digital textbook software (if available).

Assessment

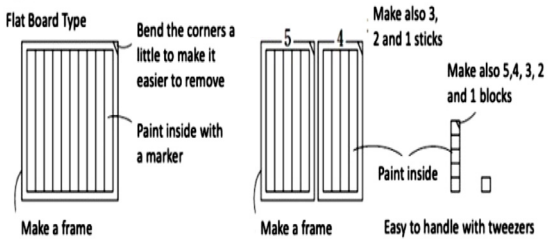
- Calculate (three-digit numbers starting with 100) – (two-digit number) correctly. F S
- Calculate the subtraction with borrowing from the hundreds place and tens place correctly. F S

Teacher's Notes

Preparation of Posting Charts for Teaching Vertical Form

2 Three Kinds of Blocks for Posting

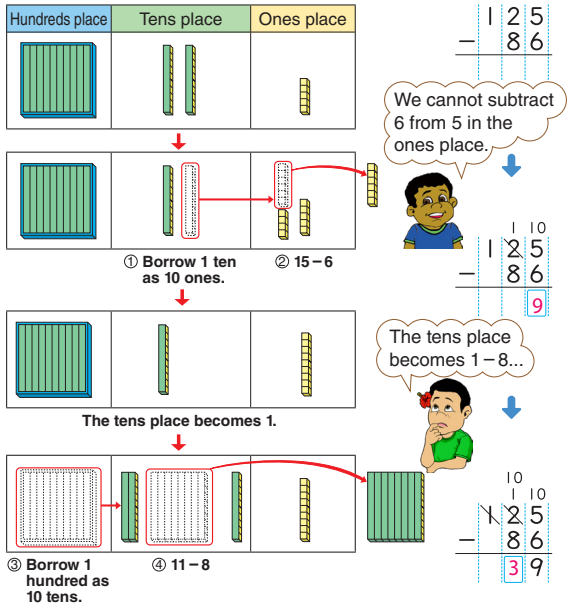
To be used for demonstration in the front, Teacher can prepare three types of block charts for posting; a flat board (with 10 sets of 10), a bar (1/2/3/4/5 sets of 10), singles (1/2/3/4/5 pieces). Teacher can prepare these block charts with ready-made graph paper sheets or improvise on their own.



2nd lesson

2 Let's explain how to calculate 125 – 86 using vertical form.

How to calculate subtraction in vertical form; (three digit number) - (two digit number) with borrowing twice



Exercise

Let's find the answers using vertical form.

① 132 – 41 91 ② 109 – 53 56 ③ 146 – 60 86 ④ 132 – 47 85

⑤ 156 – 78 78 ⑥ 171 – 82 89 ⑦ 146 – 59 87 ⑧ 120 – 61 59

64 = □ + □

2nd lesson

Lesson Flow

INTRODUCTION

1 Review.

T/P Review key ideas from the previous lesson.

BODY

2 Introduce the main task.

T Introduce and explain the main task: Let's explain how think of how to calculate 125 – 86 in vertical form.

3 2 Subtract 125 – 86.

T/P Read and understand the problem.

T Can you guess the answer?

TN Encourage pupils to have a reason, not just guess the number with their intuition, when predicting the answer.

T How many times do we do borrow?

P Share their ideas on how many times they can do borrowing.

P Think about how to calculate 125 – 86.

T "How is this problem different from the subtraction in the previous lessons?"

P Expected response: Borrowing twice

TN Have pupils to note that in Naiko's and Ambai's conversation, this problem involves borrowing twice; first from the hundreds place and next from the tens place.

4 Calculate 125 – 86 in vertical form and find the answer.

TN Tell pupils to be careful not to write 0 in the hundreds place.

T Check with pupils if they got the answer 39.

5 Exercise.

P Do the exercise

T/P Correct the exercise.

TN Encourage having a system of utilising fast learners who finished early by assigning them as "small math teachers" who check their classmates' exercise books or give advice to their friends.

This can allow Teacher to spend adequate time for slow learners who need more guidance.

CONCLUSION

6 Summary.

T/P Summarise the lesson by confirming pupils' understanding of the main ideas in the lesson.

Sample Blackboard Plan

Date: **Chapter 5**: Subtraction in Vertical Form **Sub-chapter 2:** Subtracting from Numbers that are Larger than 100 **Lesson** 2 of 3

Main Task: Let's explain how to calculate 125 – 86 in vertical form.

Review

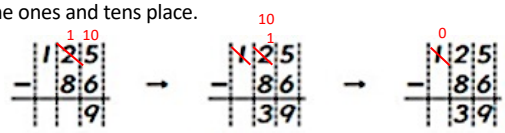
There were 129 sheets of coloured paper. Boi used 73 sheets. How many are left?

Activities

Subtraction with borrowing twice.

2 125 – 86

We cannot simply subtract both in the ones and tens place.



Borrow 1 ten as 10 ones from the tens place.

15 – 6 = 9

2 – 1 = 1

Borrow 1 hundred as 10 tens from the hundreds place.

11 – 8 = 3

1 hundred has been borrowed to the tens place. It is 0 in the hundreds place. We should not write this 0.

Exercise

1 132 – 41 = 91 2 109 – 53 = 56 3 146 – 60 = 86 4 132 – 47 = 85

5 156 – 78 = 78 6 171 – 82 = 89 7 146 – 59 = 87 8 120 – 61 = 59

Summary

- (Three- digit number) – (two-digit number) with borrowing twice in vertical form.

Unit 5

Unit: Subtraction in Vertical Form

Sub-unit: 2. Subtracting from Numbers that are Larger than 100

Lesson 3 of 3

Textbook Page : p.65
Actual Lesson 041

Lesson Objectives

- Solving (three-digit number starting with 100 and having 0 in the tens place) – (one/two-digit number).
- Think about how to calculate subtraction in vertical form.

Prior Knowledge

- (Three-digit number starting with 100) – (two-digit number)

Preparation

- Mathematics blocks, place value chart, digital textbook software (if available).

Assessment

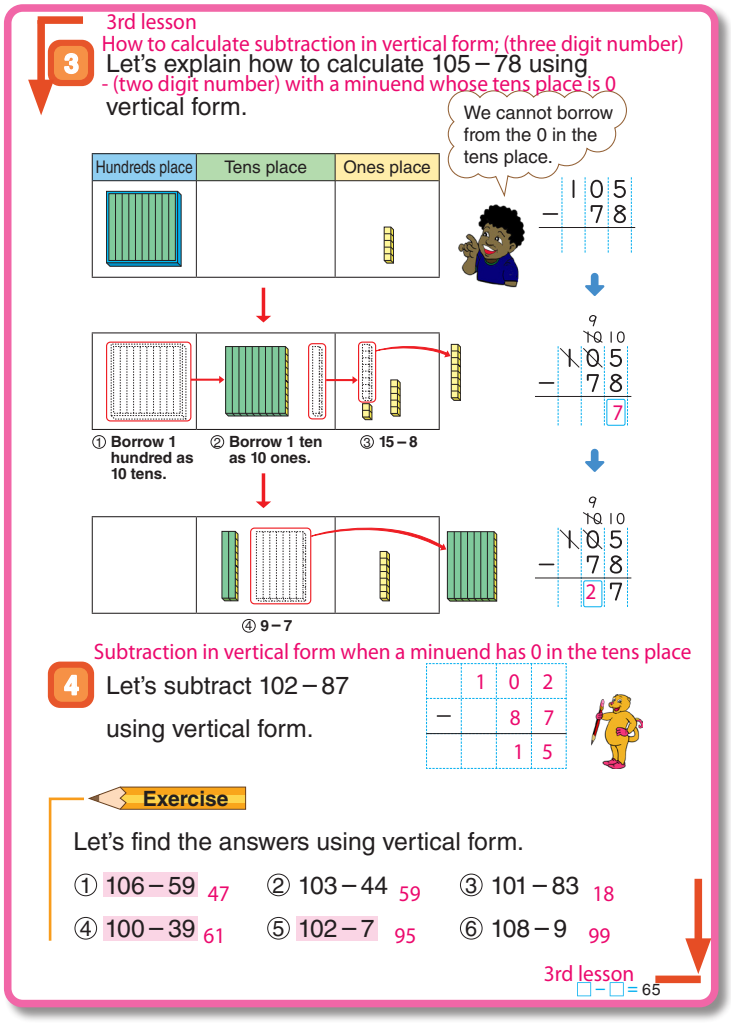
- Correctly solve (three-digit number starting with 100 and having 0 in the tens place) – (one/two-digit number). F S

Teacher's Notes

Preparation of Posting Charts for Teaching Vertical Form 3.

③ Vertical Form Calculation Worksheet

When using vertical form in calculations, it is important to ensure each number is placed properly in a respective column. While pupils practice on their own, they can use their notebooks, but when Teacher wants to explain or reinforce calculations to the entire class as a plenary activity, a posting chart can be used.



Lesson Flow

INTRODUCTION

1 Review.

T/P Review key ideas from the previous lesson.

2 Understand the lesson objective and the presented problem.

T How is this calculation different from the ones we have done in the previous lessons?

TN Let pupils think of the difference between the presented problem and the ones they have dealt with in the previous lessons. In this way, prior to the actual problem-solving, pupils can develop some ideas about which part they should be careful with and how they can solve the problem this time.

BODY

3 Introduce the main task.

T Introduce and explain the main task: 'Let's think explain of how to calculate 105 – 78 in vertical form'.

T Please explain how we can solve this problem.

P Use the blocks when they try to understand the above-mentioned rule for borrowing as well as how to borrow from the tens place which is an empty place in the original problem.

TN Explain to pupils about the rule that when borrowing values, they have to borrow first from the larger place value; for example, borrowing first from the hundreds place to the tens place, and then from the tens to the ones.

4 Calculate 105 – 78 in vertical form and solve the problem.

T Advice pupils not to write 0 in the hundreds place

TN After pupils finish calculation, teacher checks with them whether they got the answer 27.

5 Practice solving the problem in task 4.

T/P Read the problem and solve the exercises.

P Find answers using the vertical form of calculating.

6 Exercise.

TN Pupils must be aware that subtractions must be in vertical form with a minuend whose tens place is 0.

P Complete the marked ones for consolidating.

TN Walk around the classroom while pupils are solving the problems and provide s necessary guidance.

CONCLUSION

7 Summary.

T/P Summarise the lesson by confirming pupils' understanding of the main ideas in the lesson.

Sample Blackboard Plan

Date: **Chapter 5**: Subtraction in Vertical Form **Sub-chapter 2:** Subtracting from Numbers that are Larger than 100 **Lesson** 3 of 3

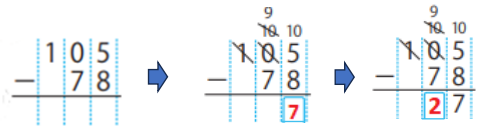
Main Task: Let's explain how to calculate 105 – 78 in vertical form.

Review

Let's review
125 - 86

Activities

3 105 – 78

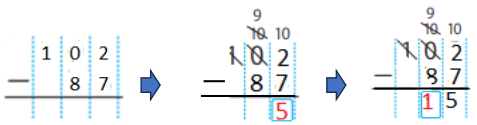


- The tens place is 0.
- We cannot borrow from the tens place.

1. Borrow 1 hundred as 10 tens.
2. Borrow 1 ten as 10 ones.
3. 15 – 8 = 7

4. 9 – 7 =2.

[4] 102 – 87



- The tens place is 0.
- We cannot borrow from the tens place.

1. Borrow 1 hundred as 10 tens.
2. Borrow 1 ten as 10 ones.
3. 12 – 8 = 7 = 5

4. 9 – 8 =1

Exercise

Let's find the answers using vertical form.

1. 106 – 59 =47
2. 103 – 44 =59
3. 101 – 83 =18
4. 100 – 39 =61
5. 102 – 7 =95
6. 108 – 9 =99

Summary

- When we cannot borrow from the tens place;

1. Borrow 1 hundred as 10 tens from hundreds place first.

2. Then borrow 1 ten as 10 ones from tens place to calculate.

Unit 5

Unit: Subtraction in Vertical Form
Sub-unit: 3. Subtraction of 3-digit Numbers
Lesson 1 of 2

Textbook Page : p.66
Actual Lesson 042

Sub-unit Objectives

- Understand ways of calculating subtraction that is (hundred number) – (hundred number) or that is (thousand number) – (hundred number).
- Accurately calculate subtraction of (three-digit number starting with some hundreds) – (one/two-digit number).

Lesson Objective

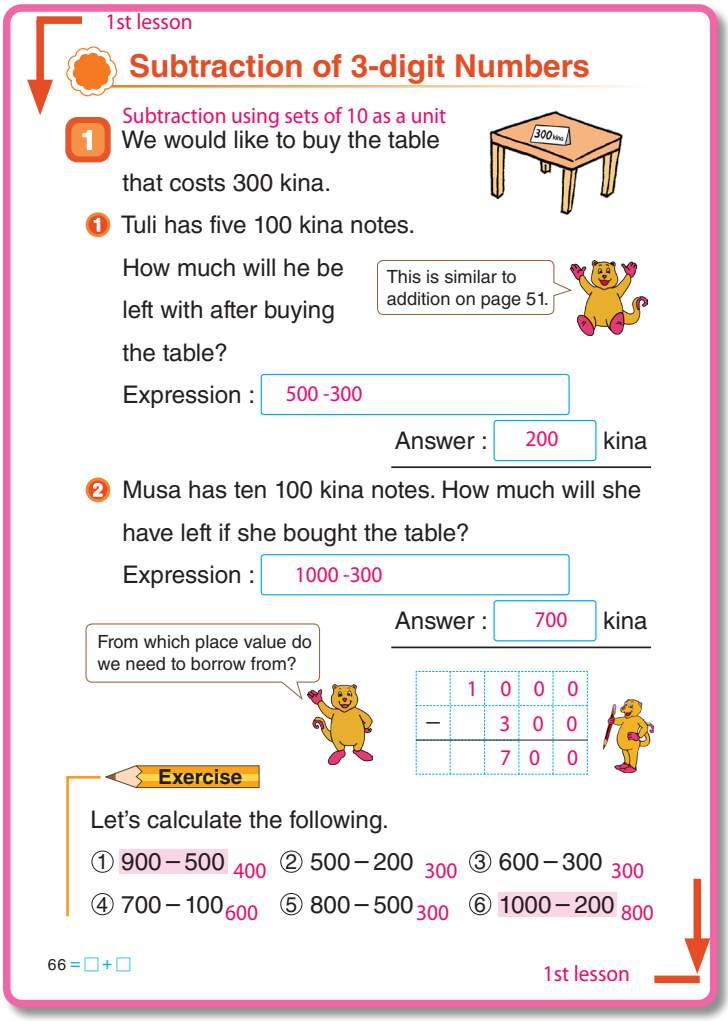
- Think about how to calculate (hundred number) – (hundred number) or (thousand number) – (hundred number)

Prior Knowledge

- Previous lesson

Preparation

- Paper 100 kina sample notes (for teacher demonstration), paper 100 kina sample notes (for pupils), place value chart.


1st lesson

Subtraction of 3-digit Numbers

Subtraction using sets of 10 as a unit

1 We would like to buy the table that costs 300 kina.

1 Tuli has five 100 kina notes. How much will he be left with after buying the table?

This is similar to addition on page 51.

Expression : 500 -300

Answer : 200 kina

2 Musa has ten 100 kina notes. How much will she have left if she bought the table?

Expression : 1000 -300

Answer : 700 kina

From which place value do we need to borrow from?

	1	0	0	0
–		3	0	0
		7	0	0

Exercise

Let's calculate the following.

① 900 – 500 400 ② 500 – 200 300 ③ 600 – 300 300

④ 700 – 100 600 ⑤ 800 – 500 300 ⑥ 1000 – 200 800

66 = □ + □

1st lesson

Assessment

- Calculate (hundred number) – (hundred number) and (thousand number) – (hundred number) correctly. F S

Teacher's Notes

Previous lesson was based on subtracting (three digit number) – (two digit number), however in this lesson there will be two key skills that the teacher will have to ensure that the students master.

1. Subtracting (three digit number) – (three digit number) and
2. Subtracting (four digit number) – (three digit number).

The main idea is that the students will try to master how to calculate subtraction of (hundred number) – (hundred number) and (thousand number) – (hundred number).

The teacher has to prepare in advance the sample paper K100 notes to manipulate students thinking.

Lesson Flow

INTRODUCTION

1 Review.

T/P Review key ideas from the previous lesson.

BODY

2 Introduce the main task.

T Introduce and explain the main task: Let's think of how to calculate (hundred number) – (hundred number).

T/P Read the given word problem, and understand.

T We will think of two cases, Tuli's and Musa's cases, and explore the calculation patterns in buying table for 300 kina.

T Check with pupils that there are two questions to be answered.

Lesson Flow

- How much will they be left with?
- How much do they have in the beginning?

TN By presenting the problem with lacking information, teacher can bring about pupils' curiosity and motivation to find out more details.

3 ① ① Think of a way to find out how much money will be left when they pay with five 100 kina notes.

T/P Read and understand task ① ①

T How much is five 100 kina notes?

P Think of a math expression and look for ways on how it can be solved.

T Reminds pupils of the Unit 1 where they used model coins to calculate addition with hundred numbers.

TN Pupils should remember when they added hundred numbers; they simply dealt with the number of 100 kina notes.

4 ① ② Think of a way to find out how much money will be left when they pay with ten 100 kina notes.

T/P Read and understand task ① ②

T How much is ten 100 kina notes?

P Think of a math expression and look for ways on how it can be solved.

T Have pupils realise that again in this problem, they can look at the number of 100 kina notes.

5 Discuss how ① and ② were calculated?

T When we compare the activity ① and ② on how we calculated, what similarity do you notice?

T How did we look at the number of 100 kina notes and calculated.

T/P Confirms with pupils that they can consider the number of 100 to simplify the calculation

CONCLUSION

6 Summary.

T/P Summarise the lesson by confirming pupils' understanding of the main ideas in the lesson.

Sample Blackboard Plan

Date: **Chapter 5**: Subtraction in Vertical Form **Sub-chapter 3:** Subtraction of 3-digit Numbers **Lesson** 1 of 2

Main Task: Let's think of how to calculate (hundred number) – (hundred number).

Review

Let's review
105 - 78

Activities

1 We would like to buy the table that costs 300 kina.

① Tuli has five 100 kina notes.

Expression: 500 – 300

Answer: 200 kina

Hundreds Place	Tens Place	Ones Place
100 100 100 100 100		
2	0	0

100 100 100

② Musa has ten 100 kina notes.

Expression: 1000 – 300

Answer: 700 kina

Thousands Place	Hundreds Place	Tens Place	Ones Place
~~1000~~	100 100 100 100 100 100 100 100 100 100		
	7	0	0

100 100 100

Exercise

Let's subtract.

① 900 – 500 = 400 ② 500 – 200 = 300 ③ 600 – 300 = 300
④ 700 – 100 = 600 ⑤ 800 – 500 = 300 ⑥ 1000 – 200 = 800

Summary

- We calculate ① and ② based on the number of 100 kina notes.

Unit 5

Unit: Subtraction in Vertical Form
Sub-unit: 3. Subtraction of 3-digit Numbers
Lesson 2 of 2

Textbook Page : p.67
Actual Lesson 043

Lesson Objective

- Think about how to calculate (three-digit number starting with some hundreds) – (one/two-digit number).

Prior Knowledge

- Previous Lesson

Preparation

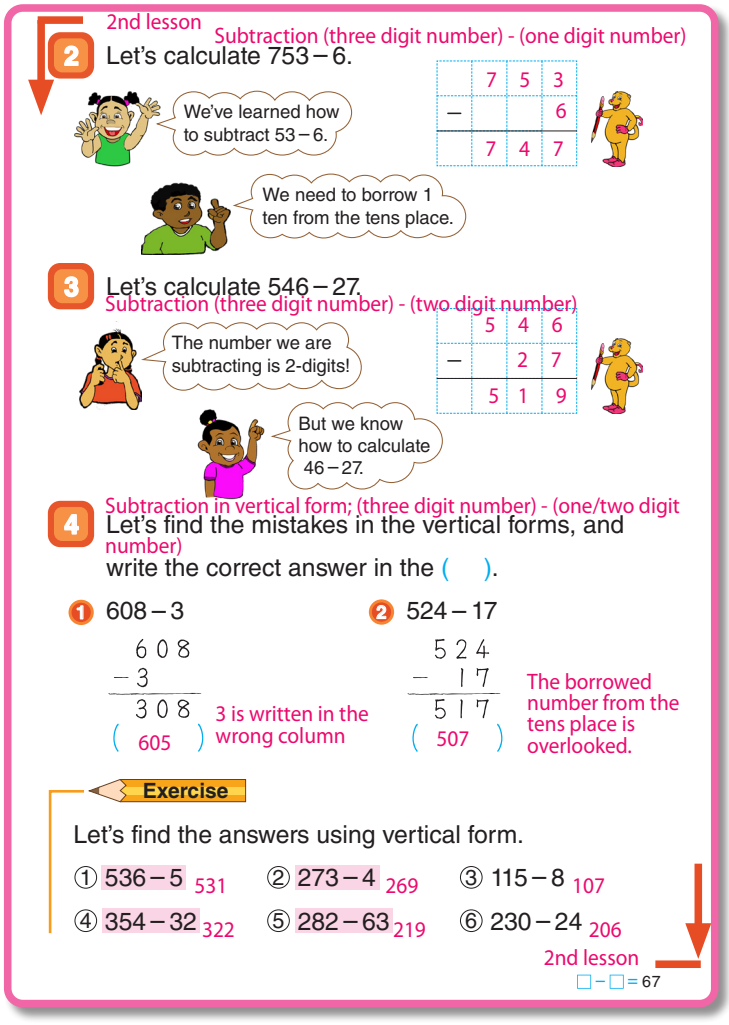
- Place value chart

Assessment

- Calculate (three-digit numbers starting with some hundreds) – (one/two-digit numbers) correctly. F S

Teacher's Notes

Where the teacher gives the Exercise, Teacher can have a system of utilising fast learners who finished early by assigning them as "small math teachers" who check their classmates' notebooks or give advice to their friends. One idea is that if pupils get checked and approved by small math teachers, they themselves can become one, which can be motivational for pupils. The more small teachers in the classroom, the more time can be saved for checking answers. Also, this can allow Teacher to spend adequate time for slow learners who need more guidance.



Lesson Flow

INTRODUCTION

1 Review.

T/P Review key ideas from the previous lesson.

BODY

2 Introduce the main task.

T Introduce and explain the main task: Let's think about how to calculate subtraction with three-digit numbers in vertical form.

T Presents problems for today's lesson 753 – 6 and 546 – 27 and the problems from the last lesson, 53 – 6 and 46 – 2. How are they different?

P Today's problems have numbers in the hundreds place.

T Today, we will learn about subtraction with three-digit numbers.

3 (2) Think about how to calculate 753 – 6.

T Let's think of how to calculate 753 – 6 in vertical form.

P Share their ideas on how to calculate.

T Checks with pupils where to place 6 in vertical form.

TN Remind pupils of the lesson on (two-digit number) – (one-digit number) and how they wrote numbers in vertical form.

4 (3) Think about how to calculate 546 – 24.

T Let's think how to calculate 546 – 24 in vertical form.

P Share their ideas on how to calculate.

T Check with pupils where to place 2 and 7 in vertical form.

TN Remind pupils of the lesson on (two-digit number) – (two-digit number).

5 (4) Identify the mistakes in vertical form.

T Let's find the mistakes in vertical form.

TN Instruct pupils to (1) copy the two problems on their notebooks as they are, (2) think on their own and write the answers they think are correct on the right side of each, and (3) check their answers with color pen/pencils and correct them if necessary.

6 Exercise.

P Do the exercise.

T/P Correct the exercise.

TN Check individuals and provide necessary guidance and explanations.

CONCLUSION

7 Summary.

T/P Summarise the lesson by confirming pupils' understanding of the main ideas in the lesson.

Sample Blackboard Plan

Date: **Chapter 5**: Subtraction in Vertical Form **Sub-chapter 3:** Subtraction of 3-digit Numbers **Lesson** 2 of 2

Main Task: Let's think about how to calculate subtraction with three-digit numbers in vertical form.

Review

	9	0	0
−	5	0	0
	4	0	0

10

	1	0	0	0
−		2	0	0
		8	0	0

Activities

2 Let's calculate 753 - 6

We learned 53 - 6

4 10

	5	3	
−		6	
	4	7	

753 − 6

4 10

	7	5	3
−			6
	7	4	7

3 Let's calculate 546 - 27

We learned 46 - 27

3 10

	4	6	
−	2	7	
	1	9	

3 10

	5	4	6	
−		2	7	
	5	1	9	

4 Let's correct the mistakes.

① 608−3

608 → 608 − 3 → 305

608 − 3 = 605

② 524−17

524 → 524 − 17 → 507

524 − 17 = 507

Exercise

Let's find the answers using vertical form.

1 536−5 =531 2 273−4 =269 3 115−8=107

4 354−32 =322 5 282−63=219 6 230−24 =206

Summary

- Subtraction of (3-digit number) – (1 and 2-digit number with borrowing.

Unit 5

Unit: Subtraction in Vertical Form

Sub-unit: 4. Relation between Addition and Subtraction

Lesson 1 of 1

Textbook Page : p.68
Actual Lesson 044

Sub-unit Objective

- Understand the mutual relationships between addition and subtraction.

Lesson Objectives

- Understand the subtraction, when the subtrahend is added to the difference, it becomes the minuend.
- Understand how to check answers in subtraction.

Prior Knowledge

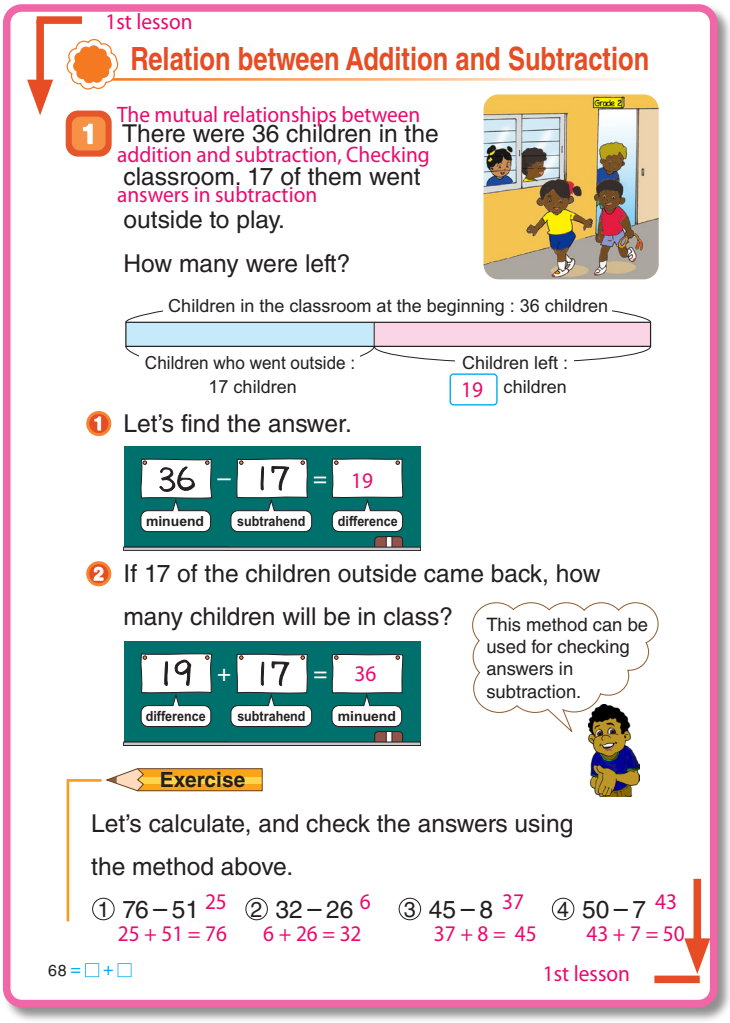
- Previous Lesson

Preparation

- Mathematics Blocks, place value chart

Assessment

- Identify that when the subtrahend is added to the difference, it becomes the minuend. F S
- Explore and apply how to check answers in subtraction. F S



1st lesson

Relation between Addition and Subtraction

1 The mutual relationships between addition and subtraction, Checking answers in subtraction

There were 36 children in the classroom. 17 of them went outside to play.

How many were left?

Children in the classroom at the beginning : 36 children

Children who went outside : 17 children

Children left : 19 children

1 Let's find the answer.

36 − 17 = 19

minuend subtrahend difference

2 If 17 of the children outside came back, how many children will be in class?

19 + 17 = 36

difference subtrahend minuend

This method can be used for checking answers in subtraction.

Exercise

Let's calculate, and check the answers using the method above.

① 76 − 51 = 25 (25 + 51 = 76)
② 32 − 26 = 6 (6 + 26 = 32)
③ 45 − 8 = 37 (37 + 8 = 45)
④ 50 − 7 = 43 (43 + 7 = 50)

68 = □ + □

1st lesson

Teachers Notes

Checking Answers in Subtraction

The step of checking one's answer after solving a problem in vertical form is an important process in mathematics. As addition is an inverse operation to subtraction, this textbook uses addition as a way to check answers in subtraction. In this way, pupils should be able to identify and correct mistakes effectively. Moreover, when such a process becomes part of pupils' habit, it can help develop attitude and mindset in pupils that they have to always carefully examine their answers. However, realistically, it is not possible to fully develop such attitude and mindset within one lesson. Pupils should be given various exercises and supplementary problems until they acquire such habit.

Lesson Flow

INTRODUCTION

1 Review.

T/P Review key ideas from the previous lesson.

BODY

2 Introduce the main task.

T Introduce and explain the main task: 'Let's identify the relationship between addition and subtraction'.

3 1 Read and understand the relationship of addition and Subtraction.

T/P Read and understand the problem.

T/P Read the word problem and make a math expression.

P 1 Write it in vertical form and find the answer.

TN As this is a problem for subtraction to find the difference, it may not be so difficult for pupils to understand the given context. However, for pupils who have difficulty in understanding the context, Teacher can tell them to first describe the situation in words so that pupils

Lesson Flow

can come to recognise it is the scene of subtraction.

4 ② Think of ways to check the answer.

T How can we check our answers whether they are correct or not. Let's think of a good way.

T/P Ensure pupils recognise that 19 children were left in the classroom after 17 of their classmates left the room. When those 17 come back, the total number of children becomes 19 + 17 = 36, which is as the number of children in the classroom at the beginning.

T Explain to pupils that when the subtrahend is put back and added to the difference, it becomes the original number (the minuend), and that this is an inverse operation to subtraction (thus, addition).

T Explains to pupils about the terms "minuend" "subtrahend" and "difference" by linking them with the numbers appearing in the problem, and introduce the following two math sentences.

TN The terms "minuend" and "subtrahend" could be difficult for pupils to understand. Teacher can rephrase such terms to easier words such as "original number" and "number to be taken away" or can demonstrate the actions of taking away and putting back.

(minuend) − (subtrahend) = (difference)
(difference) + (subtrahend) = (minuend)

5 Exercise.

P Do the exercise

TN For each problem, tell pupils to first solve it in vertical form and check the answer by also writing it in vertical form right next to it.

T Observe students and check whether pupils are following the process of doing (difference) + (subtrahend) in checking answers.

T/P Correct the exercise

CONCLUSION

6 Summary.

T/P Summarise the lesson by confirming pupils' understanding of the main ideas in the lesson.

Sample Blackboard Plan

Date: **Chapter 5**: Subtraction in Vertical Form **Sub-chapter 4:** Relation between Addition and Subtraction **Lesson** 1 of 1

Main Task: Let's identify the relationship between addition and subtraction.

Review

Let's review 546 - 27.

Activities

1 There were 36 children in the classroom. 17 of them went outside to play. How many are left?

①Let's write a math expression and find the answer.

Expression: 36 – 17

36 – 17 = 19

Minuend – subtrahend = difference

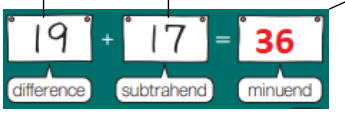
Answer: 19 children

```
  36
- 17
----
  19
```

② If 17 of the children outside came back, how many children will be in class.

Let's check the answer.

The number of children left in the classroom	—	The number of children Who went outside.	=	The number of children in the classroom at the beginning



Summary

- Minuend – Subtrahend = Difference (answer)
- Difference (answer) + Subtrahend = Minuend

Exercise: Let's calculate and check answers using the method above.

① 76 – 51 = 25 ② 32−26 = 6 ③ 45 – 8 = 37 ④ 50−7 =43

25 + 51 =76 6 + 26 = 32 37 + 8 = 45 43 + 7 = 50

Unit 5

Unit: Subtraction in Vertical Form
Sub-unit: 5. What kind of Calculation is This?
Lesson 1 of 1

Textbook Page : p.69~70
Actual Lesson 045

Sub-unit Objective

- Contextualise and understand the information in the word problem with the use of a bar diagram

Lesson Objective

- Understand the structures of "subset + subset = total" and "total − subset = subset" and that in subtraction problems, addition and subtraction are used inversely.

Prior Knowledge

- Previous lesson

Preparation

- Enlarged pictures from the textbook p.69 and 70, long tapes for pasting as bar diagrams.

Assessment

- Analyse the structure "subset + subset = total" and "total − subset = subset". F S
- Explore and apply how addition and subtraction can be used inversely. F S

Teacher's Notes

Making Mathematics Word Problems

In the units on numbers and calculations, learning activities generally follow the structure of understanding word problems presented, making math expressions based on the problems, calculating the expressions in vertical form, and finding the answers. In actual lessons,

In learning subtraction, two types of activities of solving problems and making problems, should be effectively incorporated so that pupils can develop comprehensive understanding of subtraction. Teacher is encouraged to actualise this kind of learning in lessons.

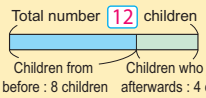
1st lesson

What Kind of Calculation is This?

1 Determining calculation patterns involving addition or subtraction, Let's compare the two problems. The mutual relationships between addition and subtraction

1

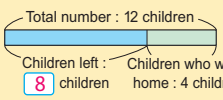
Ⓐ 8 children were playing together. 4 other children joined them.
How many children were playing altogether?



Expression : 8 + 4

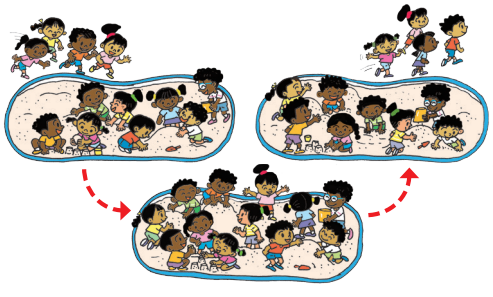
Answer : 12 children

Ⓑ There were 12 children playing together, 4 of them went home.
How many were left?



Expression : 12 - 4

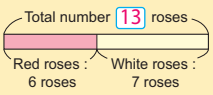
Answer : 8 children



□ − □ = 69

2

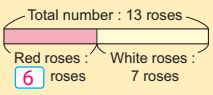
Ⓐ There are 6 red roses and 7 white roses.
How many roses are there altogether?



Expression : 6 + 7

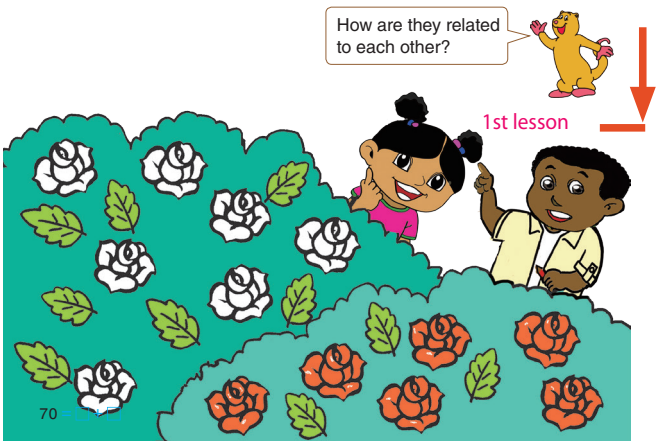
Answer : 13 roses

Ⓑ There are 13 roses and 7 of them are white. The rest are red.
How many red roses are there?



Expression : 13 - 7

Answer : 6 roses



Lesson Flow

INTRODUCTION

1 Review.

T/P Review key ideas from the previous lesson.

BODY

2 Introduce the main task.

T Introduce and explain the main task: 'Let's think about how we can calculate'.

3 ❶ Compare the two problems.

T/P Look at the picture of children playing in a sandbox and make a math story.

T How do you think we can calculate?

P Explain their answers with reasons.

4 Think about how to solve the problem ❶.

T Ask pupils to describe story Ⓐ into a simple chart. We can write a long bar or post a tape to indicate the number of pupils.

P Write a bar/tape diagram based on the given story.

TN It is important for Teacher to show them how to write.

T What does the math expression look like?

P Write the expression in their exercise books and present to the whole class.

T Ask pupils to describe story Ⓑ into a bar diagram.

P Write a bar diagram describing story Ⓑ.

T How do you think we can calculate?

P Write a math expression in their exercise books and present their answers. Aswer: 12 − 4 = 8.

5 Think about how to solve problem ❷.

T Let's describe the story Ⓐ into a simple chart.

P Write a bar diagram based on the given story.

P Write the expression in their exercise books and present to the class.

T Let's describe the story Ⓑ into a bar diagram.

P Write a bar diagram based on the given story.

TN Make sure that pupils are aware that red roses and white roses are included in the total number of roses, 13.

P Write the expression in their exercise books and present to class.

T Let's present what we notice by looking at the two problems and the bar diagrams.

P Possible responses on what can be noticed:

- While the calculation patterns are different, the bar diagrams look the same.
- We can also make a math story for 13 − 6.

CONCLUSION

6 Summary.

T/P Summarise the lesson by confirming pupils' understanding of the main ideas in the lesson.

Sample Blackboard Plan

Date: **Chapter 5**: Subtraction in Vertical Form **Sub-chapter 5:** What kind of calculation is this? **Lesson** 1 of 1

Main Task: Let's think about how we can calculate.

Review

Let's calculate and check the answer using the check method.

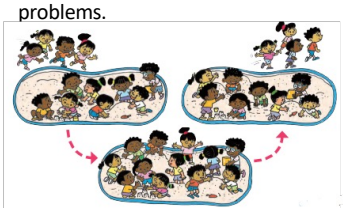
45 − 8

45 − 8 = 37

37 + 8 = 45

Activities

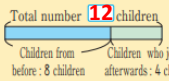
1 Let's compare the two problems.



❶

Ⓐ 8 children were playing together. 4 other children joined them.

How many children were playing altogether?

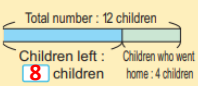


Expression : 8 + 4

Answer : 12 children

Ⓑ There were 12 children playing together, 4 of them went home.

How many were left?



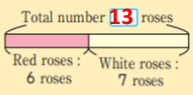
Expression : 12 - 4

Answer : 8 children

❷

Ⓐ There are 6 red roses and 7 white roses.

How many roses are there altogether?

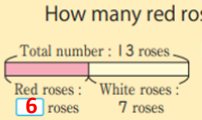


Expression : 6 + 7

Answer : 13 roses

Ⓑ There are 13 roses and 7 of them are white. The rest are red.

How many red roses are there?



Expression : 13 - 7

Answer : 6 roses



Summary

- The same set of numbers is used for both expressions.
- When we subtract the number we added from the total, its difference becomes the same as the original number

Unit 5: Unit: Subtraction in Vertical Form
Exercise
Lesson 1 of 1

Textbook Page : p.71
Actual Lesson 046

Lesson Objective
- To deepen the understanding of what has been learnt.

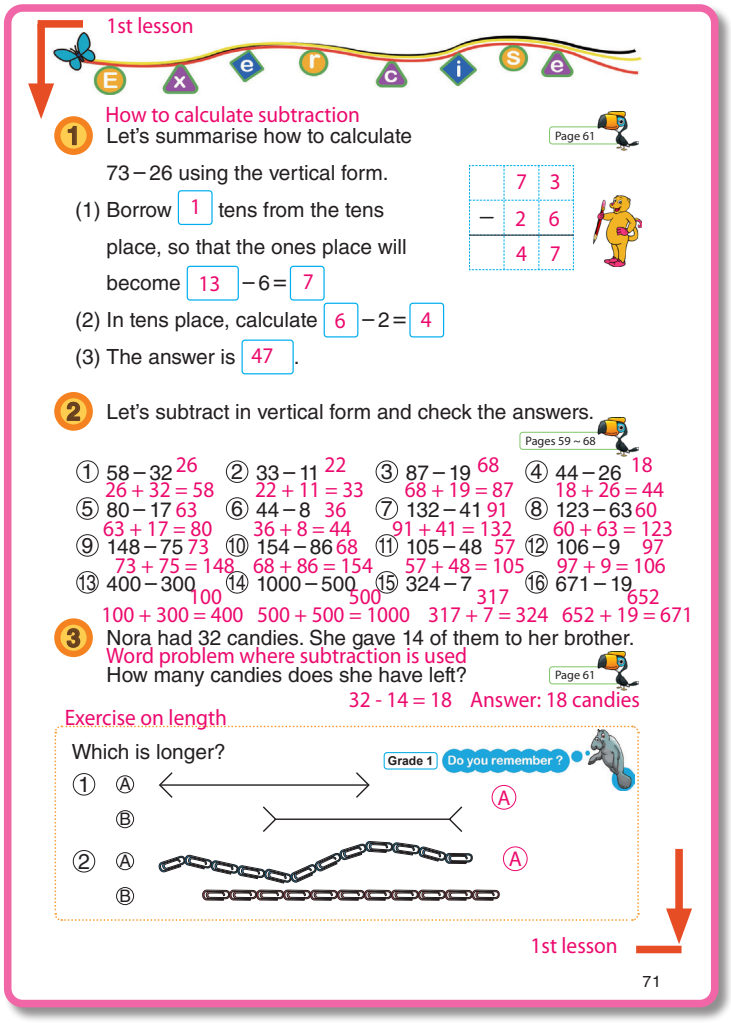
Prior Knowledge
- Concepts learnt in this unit.

Preparation
- Tape diagram.

Assessment
- Apply subtraction of vertical form in solving problems. F S

Teacher's Notes
How to effectively deliver the time for Exercise

If Teacher can set up a system of utilising fast learners who finished early to support other pupils, it can enable the teacher to spend adequate time for pupils who need more support and guidance. Fast learners can play a role of small teachers by checking answers of their classmates or giving support.



1st lesson

Exercise

How to calculate subtraction

1 Let's summarise how to calculate 73 − 26 using the vertical form. Page 61

(1) Borrow 1 tens from the tens place, so that the ones place will become 13 − 6 = 7

(2) In tens place, calculate 6 − 2 = 4

(3) The answer is 47.

	7	3
−	2	6
	4	7

2 Let's subtract in vertical form and check the answers. Pages 59 ~ 68

① 58 − 32 26 (26 + 32 = 58) ② 33 − 11 22 (22 + 11 = 33) ③ 87 − 19 68 (68 + 19 = 87) ④ 44 − 26 18 (18 + 26 = 44)
⑤ 80 − 17 63 (63 + 17 = 80) ⑥ 44 − 8 36 (36 + 8 = 44) ⑦ 132 − 41 91 (91 + 41 = 132) ⑧ 123 − 63 60 (60 + 63 = 123)
⑨ 148 − 75 73 (73 + 75 = 148) ⑩ 154 − 86 68 (68 + 86 = 154) ⑪ 105 − 48 57 (57 + 48 = 105) ⑫ 106 − 9 97 (97 + 9 = 106)
⑬ 400 − 300 100 (100 + 300 = 400) ⑭ 1000 − 500 500 (500 + 500 = 1000) ⑮ 324 − 7 317 (317 + 7 = 324) ⑯ 671 − 19 652 (652 + 19 = 671)

3 Nora had 32 candies. She gave 14 of them to her brother. How many candies does she have left? Word problem where subtraction is used Page 61

32 - 14 = 18 Answer: 18 candies

Exercise on length

Which is longer?

① Ⓐ Ⓑ (Ⓐ)

② Ⓐ Ⓑ (Ⓐ)

Grade 1 Do you remember ?

1st lesson

71

p.104 Teacher's Notes
Arithmetical Restorations

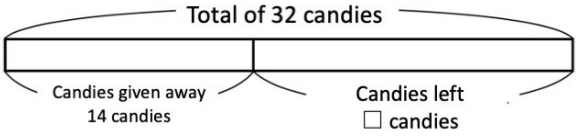
In this unit, we dealt with simple arithmetical restorations for subtraction; (two digit number) − (two digit number). In the process of finding numbers for the blank boxes □, pupils should be able to reinforce their understanding of the structure of vertical form as well as the steps and rules in vertical form calculations. They can also deepen their understanding of carrying and borrowing.
It is important that Teacher checks individual's work while walking around the classroom and provides individual support and guidance.

For Problems ① and ②, Problem ① can be given to pupils as homework and checked quickly during the lesson while Problem ② can be done during the lesson for pupils' problem-solving practices. ① and ② should be done within one period.

Lesson Flow

EXERCISE

1. Pupils summarise how to calculate (two digit number) − (two digit number) with borrowing in vertical form.
2. Pupils practice solving problems in vertical form. Teacher has pupils pay careful attention to the basic rules of using vertical form such as placing number in the same places in the same columns and borrowing numbers where necessary. Teacher also tells pupils to check their answers of the problems by calculating (difference) + (subtrahend) = (minuend). This is important especially for pupils to acquire the mindset of checking answers every time they solve some problems.
3. Pupils read the presented word problem and solve it by making a math expression. For pupils who do not know how to solve the problem, Teacher can have them write a bar diagram as shown below to get some ideas.



If there are pupils who start checking answers without being instructed by Teacher to do so, Teacher should give compliments to such pupils and acknowledge their practice to the class as a good model.

Do you remember?

Pupils review the previous learning on length.

Sample Blackboard Plan

Date: **Chapter 5**: Subtraction in Vertical Form **Sub-chapter 5:** Exercise **Lesson** 1 of 1

1. Let's summarise how to calculate 73 − 26 using the vertical form.
(1) Borrow [1] tens from the tens place, so that the ones place will become [13] − 6 = [7]
(2) In tens place, calculate [6] − 2 = [4]
(3) The answer is [47].

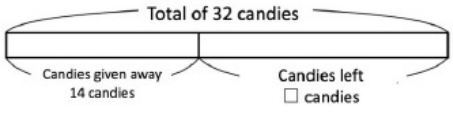
	7	3
−	2	6
	4	7

2. Calculate in vertical form and check the answers.

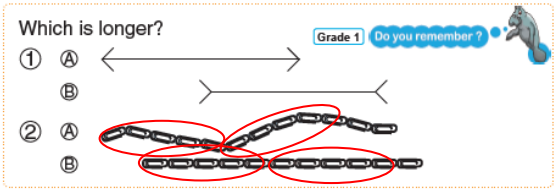
① 58 − 32	② 33 − 11	③ 87 − 19	④ 44 − 26
⑤ 80 − 17	⑥ 44 − 8	⑦ 132 − 41	⑧ 123 − 63
⑨ 148 − 75	⑩ 154 − 86	⑪ 105 − 48	⑫ 106 − 9
⑬ 400 − 300	⑭ 1000 − 500	⑮ 324 − 7	⑯ 671 − 19

①	②	③	④
58	33	87	44
-32	-11	-19	-26
26	22	68	18

3. Nora had 32 candies. She gave 14 of them to her brother. How many candies does she have left? Page 61



Math expression: 32 − 14 Answer: 8 candies



1. Compare the lines.
Answer: A
2. How many crips are there?
A: 12 clips, B: 11 clips Answer: A

Unit 5

Unit: Subtraction in Vertical Form
Problems 1 and 2
Lesson 1 of 1

Textbook Page : p.72~73
Actual Lesson 047

Lesson Objectives

- To review what have been learnt.
- To become familiar with arithmetical restorations and to deepen the understanding of the uses of vertical form and enjoy calculations through solving arithmetical restoration problems.

Prior Knowledge

- All the contents and concepts learnt in this unit.

Preparation

- Flashcards of calculations in vertical form for arithmetical restoration practices (something similar to the pictures shown on p.73).

Assessment

- Correctly do calculation of subtraction in vertical form. F S

Lesson Flow

PROBLEMS 1

1 Pupils calculate subtraction (two/three digit number) – (one or two digit number) in vertical form.
Teacher has pupils pay careful attention to writing number in the same places in the same columns and not forgetting to borrow numbers where necessary. When pupils finish solving the problems, Teacher advises them to check the answers by doing (difference) + (subtrahend) = (minuend).

2 Pupils make a math expression based on the context of the given problem and find the answer.
For pupils who have difficulty solving the problem, Teacher can advise them to think by looking at the bar diagrams as shown below.

1st lesson

Problems 1

How to calculate subtraction in vertical form

1 Let's subtract in vertical form and check the answers.

① 67 – 42 25 (25 + 42 = 67)
② 59 – 30 29 (29 + 30 = 59)
③ 96 – 16 80 (80 + 16 = 96)
④ 98 – 19 79 (79 + 19 = 98)
⑤ 90 – 38 52 (52 + 38 = 90)
⑥ 52 – 46 6 (6 + 46 = 52)
⑦ 82 – 7 75 (75 + 7 = 82)
⑧ 30 – 3 27 (27 + 3 = 30)
⑨ 162 – 81 81 (81 + 81 = 162)
⑩ 134 – 95 39 (39 + 95 = 134)
⑪ 104 – 27 77 (77 + 27 = 104)
⑫ 105 – 9 96 (96 + 9 = 105)
⑬ 425 – 7 418 (418 + 7 = 425)
⑭ 812 – 3 809 (809 + 3 = 812)
⑮ 768 – 49 719 (719 + 49 = 768)
⑯ 340 – 31 309 (309 + 31 = 340)

Word problems where subtraction is used

2 The school shoes cost 53 kina and the school bag costs 120 kina.
Which is more expensive, and by how much?



120 - 53 = 67 Answer: School bag is 67 kina more expensive.

3 There are 71 children in grade 2 at Alau's school. 39 of them are girls.
Word problems where subtraction is used
How many boys are there?
71 - 39 = 32 Answer: 32 boys

4 Let's find the mistakes, and write the correct answers in the ( ).
How to correctly calculate addition in vertical form

Tell me the mistakes.



① 71 − 47 = 34 (24) Forgetting the borrowing
② 65 − 43 = 12 (22) Subtracting although there is no borrowing
③ 94 − 6 = 34 (88) Writing 6 in the wrong place
④ 168 − 97 = 131 (71) Wrong calculation in the tens place

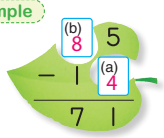
72

Problems 2

Solving subtraction in vertical form with □

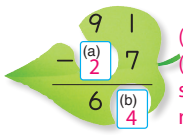
1 What numbers were eaten by insects? Write how to solve the problem.

Example



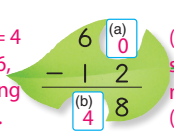
(a) is a number that makes 5 – (a) 4 = 1, so (a) is 4.
(b) is a number that makes (b) 8 – 1 = 7, so (b) is 8.

①



(b): 11 − 7 = 4
(a): 8 - (a) = 6, so the missing number is 2.

②



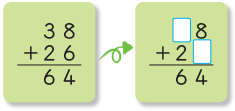
(a): a − 2 = 8, so the missing number is 0.
(b): 5 − 1 = 4

2 Make more of these problems. Exchange them with your friends and solve them.
Making subtraction in vertical form with □

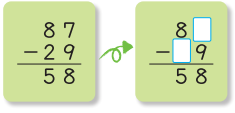
How to make a problem

① Make a correct calculation.
② Decide which numbers to replace the □.
③ Do the problem yourself to check if it can be solved.

Example 1



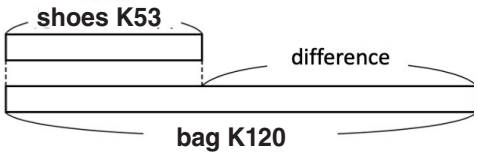
Example 2



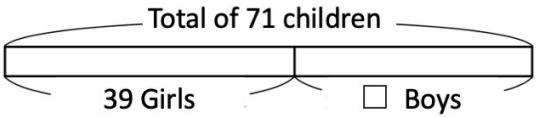
1st lesson

73

Lesson Flow



③ Pupils make a math expression based on the context of the given problem and find the answer. As in the above problem ②, for pupils who have difficulty solving the problem, Teacher can advise them to think by looking at the bar diagrams as shown below.



④ Pupils understand how to calculate subtraction in vertical form.
Teacher tells pupils to look at the calculations in vertical form and identify the mistakes.
The problem ① is wrong because a number 1 is not borrowed from the tens place.
The problem ② is wrong because 1 ten is deducted from the tens place to be borrowed although it is not necessary.
The problem ③ is wrong because a number 6 is placed wrongly in the tens place.
The problem ④ is wrong because in the tens place, the number above (6) is subtracted from the number below (9).

PROBLEMS 2

1. Pupils refer to example and make problems on their own.
   Pupils fill in the boxes with numbers. After filling in the problems with numbers, they calculate the problems to check whether there is no discrepancy in the numbers they identified.
2. Pupils solve the problem ①.
   Pupils try to identify numbers for the blanks.
   Pupils can think like below.
   For (b), solve $11-7$ and get 4 for the blank.
   For (a), solve $(9-1)=6$ and get 2 for the blank.
3. Pupils solve the problem ②.
   For (a), solve $(a)-2=8$ and get 0 for the blank.
   For (b), solve $(6-1)-1$ and get 4 for the blank.
4. Pupils make problems for arithmetical restorations, exchange them with their friends and solve.
   As in the Examples 1 and 2 shown on the textbook, pupils first make entire problems including answers, and hide two or so with blanks.
   Pupils exchange with their friends the problems they made and try to solve them.

Due to space limitations, the Teacher's Notes is placed on page 102.

Sample Blackboard Plan

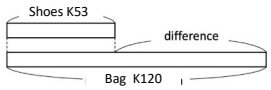
Date: **Chapter 5**: Subtraction in Vertical Form **Sub-chapter 5:** Problems 1 and 2 **Lesson** 1 of 1

Problems 1

① Let's subtract in vertical form and check the answers.

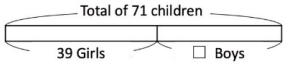
(1) 67 – 42: 67 − 42 = 25
(2) 59 – 30.: 59 − 30 = 29
(6) 52 – 46.: 52 − 46 = 6
(8) 30 - 3: 30 − 3 = 27
(9) 162 – 81: 162 − 81 = 81
(11) 104 – 27: 104 − 27 = 77
(13) 425 - 7: 425 − 7 = 418
(15) 768 - 49: 768 − 49 = 719

② Shoes K53, Bag K120 Which is more expensive? How much?



120 – 53 = 67
Answer: K 67

③ There are 71 children. 39 of them are girls. How many boys are there?



71 – 39 = 32
Answer: 32 boys

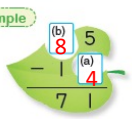
④ Let's find the mistakes, and write the correct answers in the ( ).

① 71 − 47 = 34 (24.)
② 65 − 43 = 12 (22)
③ 94 − 6 = 34 (88)
94 − 6 = 88
④ 168 − 97 = 131 (71)

Problems 2

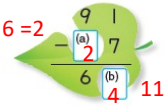
① What numbers were eaten by insects? Write how to solve the problem.

Example



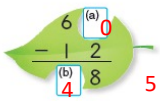
(a) is a number that makes 5 − (a) = 1, so (a) is 4.
(b) is a number that makes (b) − 1 = 7, so (b) is 8.

① 9 – 6 =2



11 – 7 =4

② 10 – 8 = 2

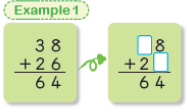


5 – 1 = 4

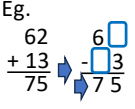
② Make more of these problems. Exchange them with your friends and solve them.

How to make a problem
① Make a correct calculation.
② Decide which numbers to replace the ☐.
③ Do the problem yourself to check if it can be solved.

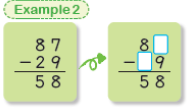
Example 1



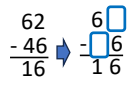
Eg.



Example 2



Eg.



End of Chapter Test: Chapter 5 **Date:**

Evaluation: Chapter 5 Subtraction in Vertical Form	Name:	Score /100

1. Let's find the answers using vertical form. [10 points for each question]

(1) 38 − 15 (2) 26 − 3 (3) 65 − 17 (4) 30 − 13

(5) 145 − 127 (6) 207 − 139 (7) 236 − 38 (8) 224 − 149

2. Make a math sentence and find the answer.

[5 points for math sentence and 5 points for answer]

(1) There were 43 postage stamps. I used 28 of them. How many are left?

Math sentence _____ Answer _____

(2) The school shoes cost 65 kina and the school bag costs 124 kina. Which is more expensive, and by how much?

Math sentence _____ Answer _____

Chapter 6 Lengths

1. Unit Objectives

- To understand the meaning of units and measurements of length, and measure the length.
- To get to know the units of length (millimeter [mm], centimeter [cm] and meter [m]).

2. Teaching Overview

The purpose of this unit is that pupils understand the unit of length and the meaning of measurement, and to be able to measure length.

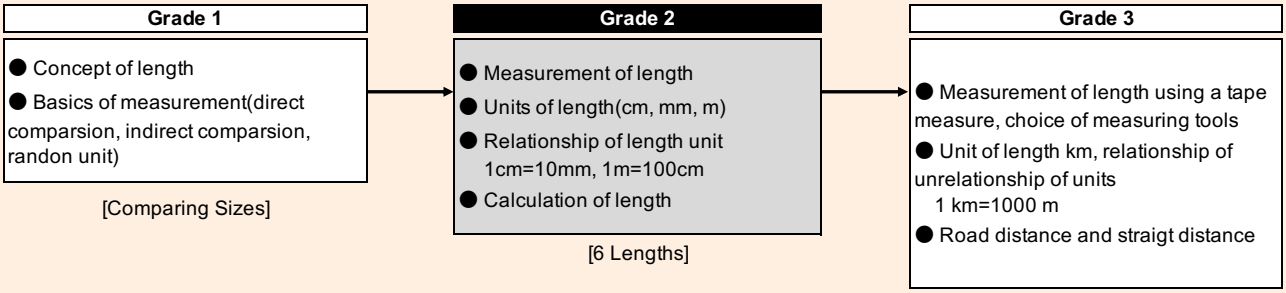
How to Compare: Think of ways to compare tape lengths, and through mathematical activities involving direct comparison, indirect comparison, and comparison using arbitrary units, pupils explain how a length can be expressed by the number of that unit.

How to Represent Lengths, Metres: Introduce the universal unit of length, cm.
Through the activity of expressing the length of objects in cm, pupils will learn the necessity of the unit mm, which is smaller than cm, and the unit m, which is larger than cm, and understand how to convert length units. In addition, pupils understand the structure and usage of a ruler (how to measure length, how to draw a straight line, etc.) so that they can measure correctly.

Let's Find the Lengths: Pupils think about and explain calculation methods for simple addition and subtraction of length.

Key Concepts: Lengths and Unit of measurement of lengths (mm, cm, m).

3. Related Learning Contents



Unit 6

Unit: Lengths
Sub-unit: 1. How to Compare
Lesson 1 of 2

Textbook Page : p.74~76
Actual Lesson 048

Sub-unit Objective

- To explore ways of measuring the lengths of tapes and come to realise the use of a measuring unit in comparing the lengths. In comparing lengths, to describe the lengths using the measuring unit.

Lesson Objective

- To explore ways of measuring the lengths of tapes and understand the use of a measuring unit in comparing the lengths.

Prior Knowledge

- Grade 1, Chapter 13 Comparing sizes

Preparation

- Mathematics blocks, long tapes, erasers, other objects usable as measuring units.

Assessment

- Explore and Identify ways of measuring the lengths of tapes using arbitrary units. F S
- Understand and compare the use of a measuring unit using different lengths. F S

Lesson Flow

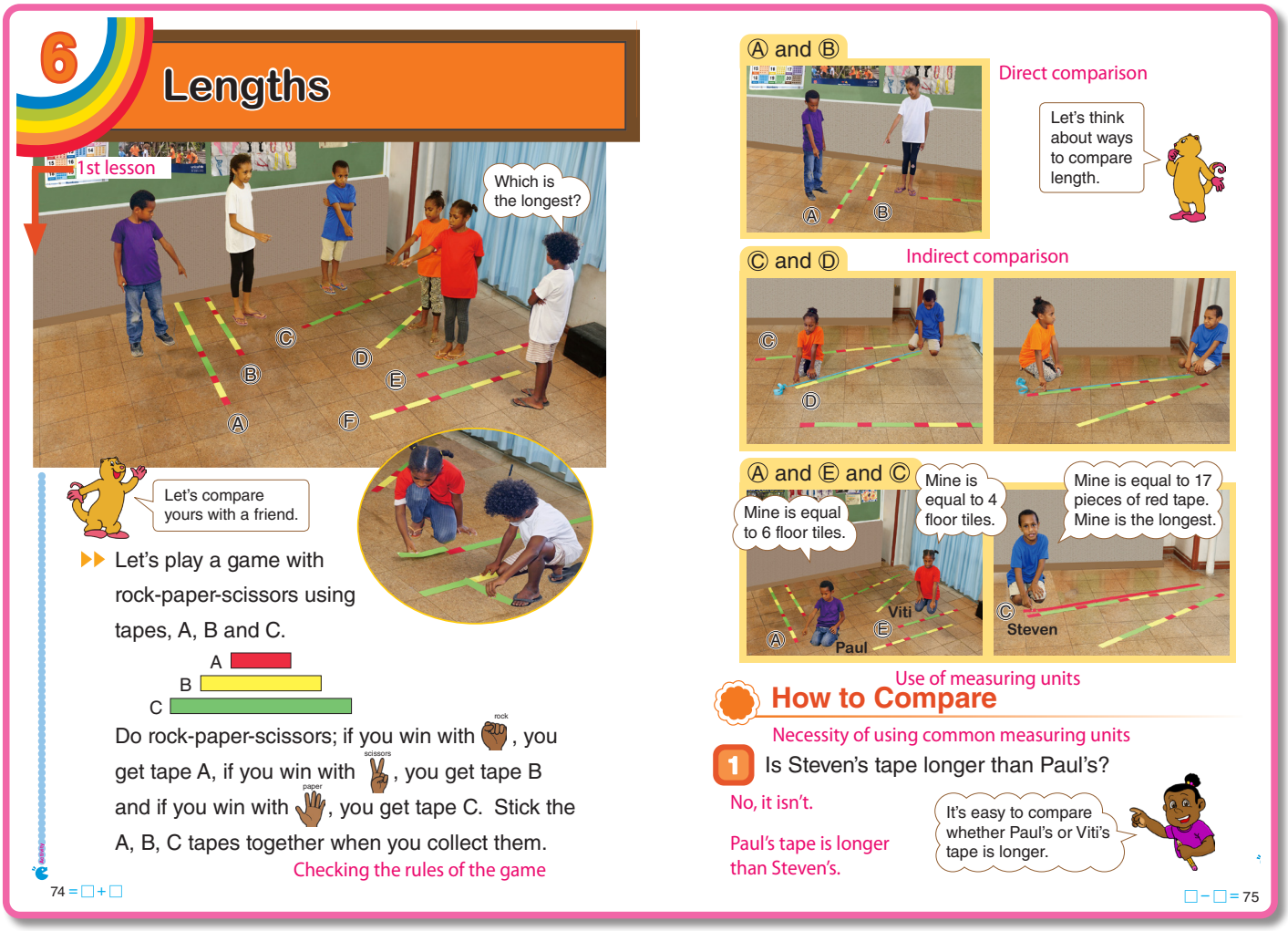
INTRODUCTION

1 Play a competitive game of rock-paper-scissors to understand the situation.

T/P ▶▶ Let the pupils play the game on rock-paper-scissors and goes over the game rule with pupils:

- If you win with rock, you get a tape A. If you win with scissors, you get a tape B. If you win with paper, you get a tape C.

P Make pairs and play the game 15 times and determine how many tapes are left.



BODY

2 Introduce the main task.

T Introduce and explain the main task: Let's think about ways to compare lengths.

3 Think about how to compare the lengths of the tapes received after the game.

T Who got the longest?

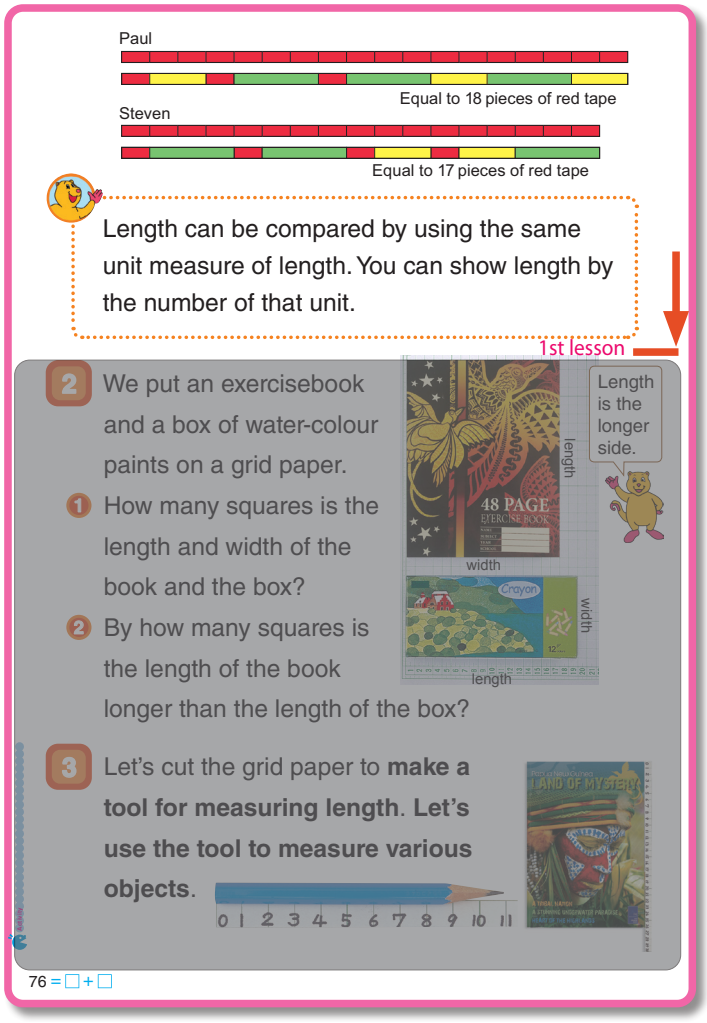
P We cannot tell. We have to compare.

TN After drawing out the comments from pupils, Teacher moves on to the next activity of comparing the lengths.

T Let's compare the lengths of the tapes you received.

P Write down the names of classmates who have longer tapes than their own and how they compared the tapes.

TN This situation helps pupils realise where they cannot directly compare the lengths (as they cannot move the objects or they are far from each other), Pose that question in class and have everybody think of a better way. Through this thinking, pupils should be able to realise the use of indirect comparison.



4 Discuss various ways they used in comparing the lengths of the tapes.

T Let's discuss some good ways we can use to compare the lengths, or the ways that did not work.

P Possible responses:

- If we put one ends together, we can easily tell which one is longer.
- We can count the number of tiles on our floor to find how long each tape is.
- We can attach a rope for each tape and compare its length and we can also use pencils or erasers.

TN Make sure that the ideas cover the applications of direct comparison, indirect comparison and measuring units, although these terms are not used yet by the teacher.

T Let's try the ways you have not done yet.

5 Read, understand and think about how to compare the lengths.

T 1 Look at the last two pictures on p.75 and ask this question: Can we tell if Paul's tape is longer than Steven's?

P Arrange all the tapes as shown from the book and realise that Paul's tape is longer than Steven's.

TN Show or make some common measuring units so that pupils experience the difficulty in comparing the lengths and moreover the usefulness of having such common units to measure.

6 Important point.

T/P Read the important point in the [ ].

T Explain their understanding of the important point in the box.

CONCLUSION

7 Summary.

T/P Summarise the lesson by confirming pupils' understanding of the main ideas in the lesson.

Due to space limitations, the Teacher's Notes and Sample Blackboard Plan are placed on page 136.

Unit 6: Unit: Lengths

Sub-unit: 1. How to Compare

Lesson 2 of 2

Textbook Page : p.76
Actual Lesson 049

Sub-unit Objective

- To explore ways of measuring the lengths of tapes and come to realise the use of a measuring unit in comparing the lengths. In comparing lengths, to describe the lengths using the measuring unit.

Lesson Objective

- To practice measuring various objects by using squares on a grid paper as a measuring unit.

Prior Knowledge

- How to compare.
- Length can be compared by using the same unit measure of length. You can show length by the number of that unit.

Preparation

- 30 cm long grid papers (a sheet for each pupil)
- Measuring sticks (20 pieces)

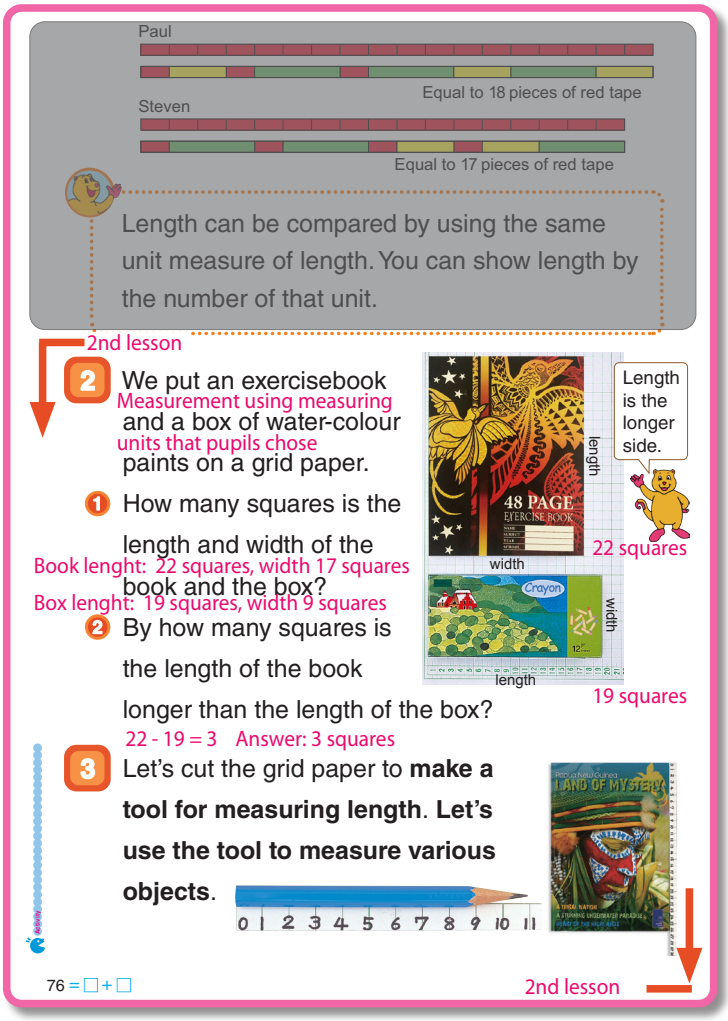
Assessment

- Explore and practice measuring various objects using squares on a grid paper as a measuring unit. F S

Teacher's Notes

In this lesson, focus on identifying and using a same unit to measure lengths. Strips of grid paper should be distributed to all groups for measuring length. In doing so, the squares on the strips become the unit of measurement.

Due to space limitations, the 2nd Teacher's Notes is placed on pages 136-137.



Lesson Flow

INTRODUCTION

1 Review.

T/P Review key ideas from the previous lesson.

BODY

2 Introduce the main task.

T Introduce and explain the main task: Let's think about ways on how to compare lengths of various objects.

3 Think of how to compare the measurements of a Notebook and a water colour paint box.

T/P 2 Read and understand the given situation and think about how they can compare the lengths of two objects.

TN Prior to the lesson, grid papers should be cut by Teacher in the form of long strips of paper and distribute them to pupils.

T 1 How can we use the squares on a grid

Lesson Flow

paper to compare the length and the width of the book and the box?

P Work in groups and find how many squares are there for the length and the width of the Notebook and the Box?
Book lenght 21 squares, width 15 squares
Box lenght 17 squares, width 8 squares

T Teacher confirms with pupils that they can compare the lengths based on the number of squares on a grid paper.

T/P 2 By how many squares is the length of the book longer compared to the length of the box?

P Compare the length and width of the Box by subtracting.
21 – 17 = 4 Answer: 4 squares

T Teacher confirms with pupils that they can compare the lengths based on the number of squares on a grid paper.

4 Measure the lengths of various objects by using the measuring stick.

T 3 Let's make a measuring tool with a grid paper to measure the lengths of various objects by using the stick we made.

TN Advise pupils to work in pairs to properly place the stick along the objects, making sure the beginning point of the measuring stick meets with that of an object. Pupils should also be careful with reading the ending mark.

P Possible responses:
- Pupils write numbers inside the squares of the grid paper. (A)
- Pupils write numbers on top of the lines of the grid paper. (B)

P In pairs identify 3 objects in the classroom to measure the lengths using a measuring stick.

T Take note that many pupils tend to write numbers as in the style (A) inside each square based on the understanding that they will measure lengths by counting the number of squares.
To help overcome such misunderstanding, Teacher can pose a question "which part shows the length of each square?" and have them realise they should write numbers at the end of every square as in the style (B).

CONCLUSION

5 Summary.

T/P Summarise the lesson by confirming pupils' understanding of the main ideas in the lesson.

Sample Blackboard Plan

Date: **Chapter 6** : Lengths **Sub-chapter 1:** How to Compare **Lesson** 2 of 2

Main Task: Let's think about ways on how to compare lengths of various objects.

Review

- Fill in these words (measurement, number, same, unit) correctly in the spaces.

1. Length can be compared by using the_____unit of _____.

2. You can show length by the _____ of that _____.

Activities

2 Let's measure the note book and the colour box.

①

Item	How many squares (length)	How many squares (width)
Note book	22	17
Colour box	19	7

② By how many squares is the length of the book longer than the length of the box?.

Book: 22 squares Colour box: 19 squares

22 – 19= 3

Answer: 3 square grids more for the book.

3 Tool for measuring length using grid paper.

A. Write numbers inside the squares of the grid paper.

1	2	3	4	5	6	7	8	9	10	11

- There are a lot of lengths for 4 pieces.
- If there are not 4 grids, it will be 4 numbers.
- We don't know if the location on the lines is 4 or 5.

B. Write numbers on the lines of the grid.

0 1 2 3 4 5 6 7 8 9 10 11

- The numbers are written at the end of the length of one grid.
- Easy to understand how far it is for 4 pieces.

Write the measurement of the objects measured by the pupils using the tool.

Summary

- When we use the same measuring tool (grids, sticks) to measure items, we can compare and check the items easily.

Unit 6: Unit: Lengths

Sub-unit: 2. How to Represent Lengths

Lesson 1 of 4

Textbook Page : p.77
Actual Lesson 050

Sub-unit Objectives

- To learn about “cm” as a universal unit of length.
- To measure lengths accurately by using “cm”.
- To learn about “mm” as a unit to measure smaller lengths than 1 cm.
- To understand that 1 cm = 10 mm and convert from one unit to another.
- To measure the lengths of objects and express the measurements in compound number using “cm” and “mm”.

Lesson Objectives

- To measure the lengths of surrounding objects by using the measuring sticks.
- To learn about “cm” as a unit to measure lengths.

Prior Knowledge

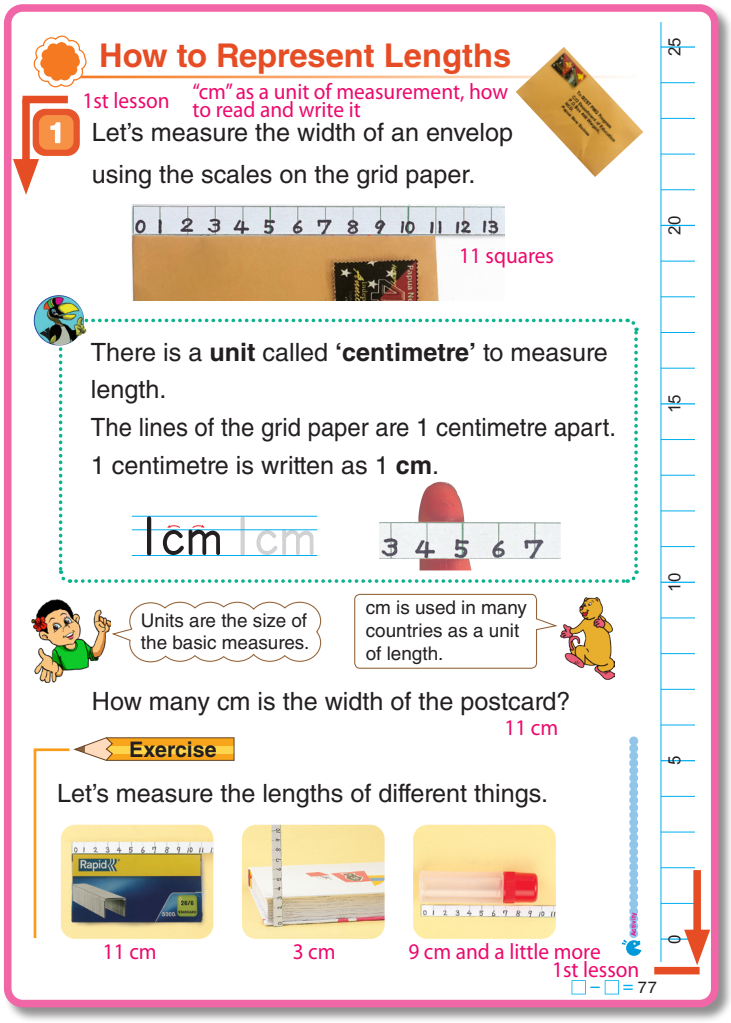
- How to compare.
- Length can be compared by using the same unit measure of length. You can show length by the number of that unit.

Preparation

- Measuring sticks pupils made with the grid paper in the previous lesson.

Assessment

- Read and write cm as a unit of measurement. F S



Teacher’s Notes

In this lesson the teacher should explain that the measuring unit we chose would only work in this class, but when we start to use it outside, for example with friends from the other classes or from different schools or towns, it will not work in the same way. We will have a problem without having something common to measure lengths.
To avoid such problems, this unit called centimetre was made.

Why using a grid paper?
Some of us would think that we should use a ruler instead of a grid paper when we start to teach the universal units. This textbook, however, brings in a ruler when a unit (millimetre: mm) is introduced. This is because millimetre marks on a ruler are not necessary at this stage and moreover, the textbook wants our pupils to have a fresh feeling when they encounter an activity later on of dividing 1 cm into 10 and making a smaller unit called “mm”. For these reasons, a ruler is not used and a measuring stick made with a grid paper is used in this lesson instead.

Lesson Flow

INTRODUCTION

1 Review.

T/P Review key ideas from the previous lesson.

BODY

2 Introduce the main task.

T Introduce and explain the main task: "Let's think about ways on how to compare lengths of various objects."

3 Use the measuring stick to measure its width.

T/P 1 Read and understand the situation and discuss what to do.

P It is as long as 10 squares of the grid paper.

T Confirm with pupils that its width is as long as 10 squares of the grid paper.

4 Important point.

T/P Read the important point in the ⋯⋯.

T Explains further: The lines of the grid paper are 1 centimetre apart. The length of each square is 1 centimetre.

5 Look for objects that are 1 centimetre long.

T Let's try to look for something that you think is about 1 cm.

P Eraser. A piece of cello tape/ sticking tape.

TN While looking at various objects in their surrounding environment, pupils should be able to develop their sense of the size of length for 1 cm.

T Reaffirm and explain that the width of 10 squares of the grid paper is called "10 cm", and identifies other lengths together with pupils by calling "1 cm, 2 cm, 3 cm..."

6 Exercise.

P Do the exercise.

TN When pupils encounter lengths that are not some exact centimetres, Teacher can tell pupils, at this stage, to describe them by saying "◯◯ cm and a little more", "a little more to ◯◯ cm", or "◯◯ cm and about a half".

T Ask each group to check each other's work whether they are properly measuring things.

P Estimate each length before the actual measurement.
The beginning point of the measuring stick meets with that of an object and they should be also careful with reading the ending mark.

CONCLUSION

7 Summary.

T/P Summarise the lesson by confirming pupils' understanding of the main ideas in the lesson.

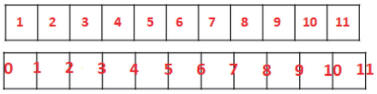
Sample Blackboard Plan

Date: **Chapter 6** : Lengths **Sub-chapter 2:** How to Represent Lengths **Lesson** 1 of 4

Main Task: Let's think about ways on how to compare lengths of various objects.

Review

- We can compare and check the items easily when we use the same measuring tool.
- Which measuring tool is best to use and why??



Activities

1 Let's measure the width of an envelope using the scales on the grid paper.



- The width of the envelope is as long as 10 squares of the grid

Important Point

There is a unit called '**centimetre**' to measure length.
The lines of the paper are 1 centimetre apart. 1 centimetre is written as 1cm.



- How to write 1 centimetre.

1cm 1cm

Write the names of the objects that are 1 cm long given by the pupils.

Exercise

Write the lengths of the objects that pupils measured.

Summary

- Centimetre is a unit to measure length.
- 1 centimetre is written as 1 cm

Unit 6

Unit: Lengths
Sub-unit: 2. How to Represent Lengths
Lesson 2 of 4

Textbook Page : p.78
Actual Lesson 051

Lesson Objective

- To measure the lengths of tapes and lines by using the measuring sticks marked in centimetres.

Prior Knowledge

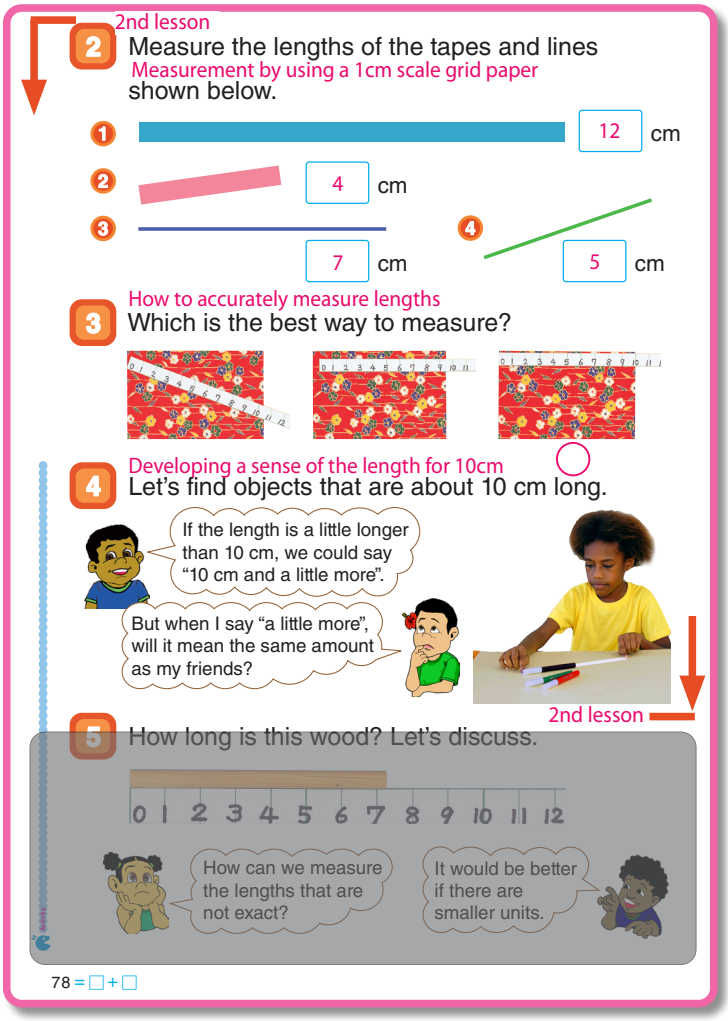
- Read and write cm as a unit of measurement.
- Length can be compared by using the same unit measure of length and showing length by the number of that same unit.

Preparation

- Measuring sticks pupils made in the prior lesson, colored paper.

Assessment

- Measure the lengths of various objects using the measuring sticks marked in centimetres. F S



Teacher's Notes

In the activity of measuring objects
When carrying out the activity of measuring the lengths of the objects, it is better to group pupils into pairs or groups. It is because pupils can check with each other and prevent themselves from making various mistakes, i.e. not placing rulers properly or misreading the marks. While they collaboratively work in groups and learn from each other, each individual can improve his/her own skill for accurate measurement.
During the activity, Teacher can also instruct pupils to look for objects that have lengths of exact centimetres such as 5 cm, 6 cm, and 7 cm. It can be a good exercise for pupils to estimate the lengths, and moreover to acquire a good sense of the lengths and sizes. Pupils should explore measuring various objects as it can become an important foundation for the coming lessons.

Lesson Flow

INTRODUCTION

1 Review.

T/P Review key ideas from the previous lesson.

BODY

2 Introduce the main task.

T Introduce and explain the main task: "Let's measure lengths of various objects using measuring tools made from the grid paper".

3 Measure the lengths of tapes and lines using the measuring sticks made with the grid paper.

T 2 By using the measuring sticks, let's measure the lengths of the tapes and lines.

TN Check and advises pupils to place the sticks properly along the lines and the sides to measure them properly.

P 1) 12 cm 2) 4 cm 3) 7 cm 4) 5 cm

Lesson Flow

4 Think of how to find is the correct way to measure.

T 3 Inform students to discuss in groups which is the correct way to measure? (Show pupils a piece of paper.)

P Possible responses:

- Picture 1-(not correct) The ruler is placed properly along the side and not placed correctly.
- Picture 2-(not correct) The 0 mark of the ruler is not correctly placed on the left end of the paper).
- Picture 3-(correct measurement) The 0 mark is placed properly on the end of the measuring sticks and the measuring sticks is placed properly along the side.

T Allow time for pupils to practice measuring the length of a piece of paper before moving onto the next problem.

5 4 Finding objects that are about 10 cm long.

T/P Let's find objects that are about 10cm long.

TN Inform pupils to take notes of various objects they measured and acquire the image of 10cm. For things they measured, pupils can record their findings by writing "exactly 10 cm" "10 cm and a little more" or "a little more to 10 cm". Pupils should be able to identify the needs of smaller units.

P Present the lengths of the objects they measured and recorded.

T Confirm with pupils that there are objects with different lengths and that the lengths are not always in exact centimetres.

- There are many objects that are 10 cm and How long do we exactly mean by "a little more"? An Extra measure.

CONCLUSION

6 Summary.

T/P Summarise the lesson by confirming pupils' understanding of the main ideas in the lesson.

Sample Blackboard Plan

Date: **Chapter 6** : Lengths **Sub-chapter 2:** How to Represent Lengths **Lesson** 2 of 4

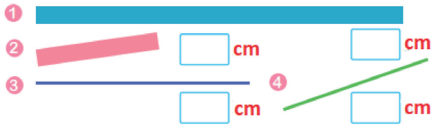
Main Task: Let's measure lengths of various objects using measuring tools made from the grid paper.

Review

- What is the name of the unit we can measure length with anytime?
- 1 centimetre is written as _____.

Activities

2 Measure the lengths of the tapes and lines.



3 Which is the best way to measure?



The ruler is not placed correctly. | The 0 mark of the ruler is not correctly placed. | Correct measurement.

4 Let's find objects that are about 10 cm long.

Write the names of the objects that are 10 cm, 10 cm and little more given by the pupils.

Summary

- We can measure lengths of different objects using measuring tool that is marked with centimetre.
- To measure correctly, place the 0 mark along the side of the object.

Unit 6: Unit: Lengths

Sub-unit: 2. How to Represent Lengths

Lesson 3 of 4

Textbook Page : p.78~80
Actual Lesson 052

Lesson Objectives

- To understand that the unit “cm” can be divided into 10 to get smaller units when objects cannot be measured in exact centimetres.
- To understand the use of rulers in measuring smaller units.
- To learn about the unit “mm” and that 1 cm can be converted into 10 mm

Prior Knowledge

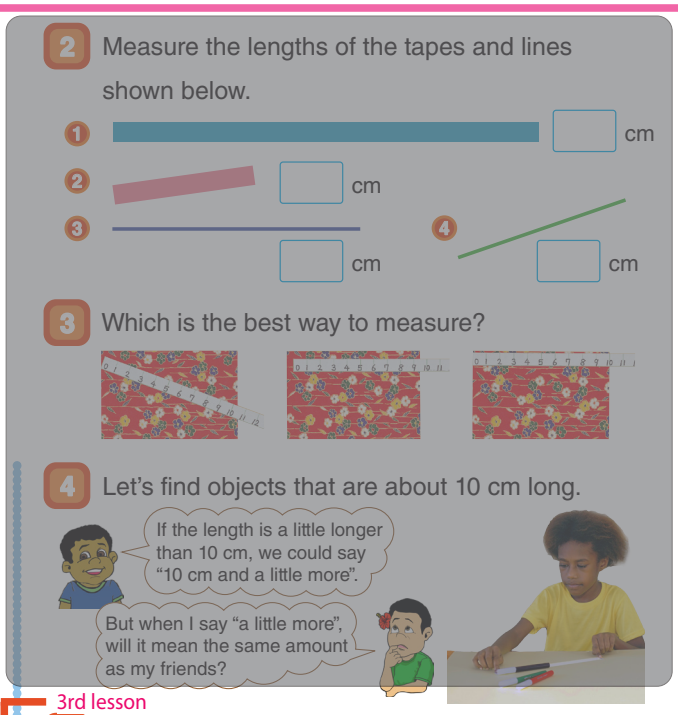
- We can measure lengths of different objects using measuring sticks that are marked with centimetres.

Preparation

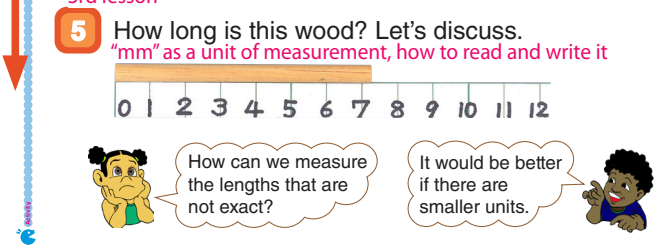
- Measuring sticks made with the grid paper, sticks which are a little longer than 7 cm (i.e. 7 cm 2 mm), 30 cm ruler, digital textbook software (if available).

Assessment

- Understand that cm can be divided into smaller units when objects cannot be measured exactly in centimeters. F S
- Realise and understand the usefulness of rulers in measuring smaller units. F S
- Learn that 1 cm = 10 mm. F S



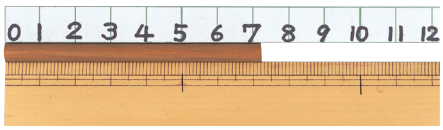
3rd lesson



78 = □ + □

If you use a **ruler**, you can also measure the lengths which fall between the units.

The length of the stick is a little longer than 7 cm. How many smaller units does it fill beyond the 7 cm? 2 marks





How many smaller units is 1 cm divided into?



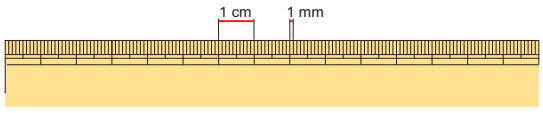
10 marks

The length of 1 cm equally divided into 10, is called 1 **millimetre**, and is written as 1 **mm**.

1mm 1mm

Millimetre (mm) is another unit of length.

1 cm = 10 mm



□ − □ = 79

Lesson Flow

INTRODUCTION

1 Review.

T/P Review key ideas from the previous lesson.

BODY

2 Introduce the main task.

T Introduce and explain the main task, "How can we measure the lengths that are smaller than 1 cm".

3 Measure the length of a stick that is not in exact centimetres.

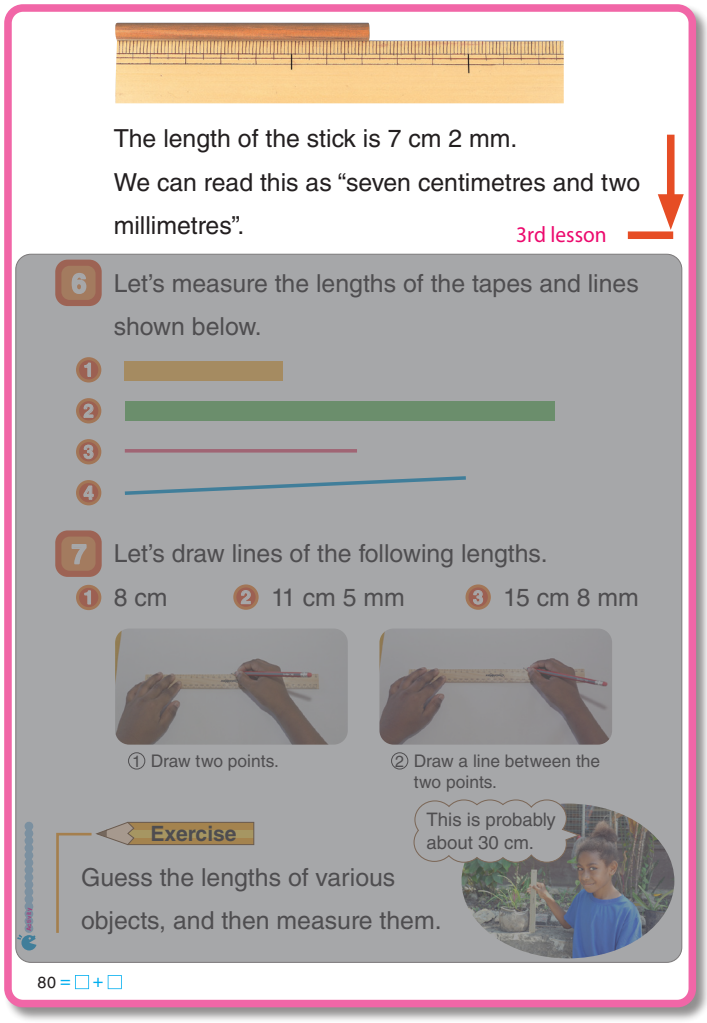
T 5 How long do you think this stick is?

P Possible responses:

- It is 7 cm and a little more.
- It is somewhere between 7 cm and 8 cm and I want to find out exactly how long it is.

TN If Teacher recognised in the previous lesson the kind of difficulties pupils faced without smaller units, such examples can be revisited here and shared or explained again to the class.

4 Think of how to measure lengths that are not in exact centimetres.



T How do you think we can measure those smaller lengths?

P Possible responses:

- We can measure them using a ruler with smaller scales. Or we can divide 1 cm into 10 and put marks.
- We place marks smaller than 1 cm. We add marks right between each centimetre.

T Acknowledge the idea that if a ruler has smaller scales, they can measure lengths smaller than 1 cm.

5 Think of how they can measure smaller lengths and learn about the unit "mm".

T Shows a ruler to pupils and draws their attention to the marks smaller than 1 cm.

T/P Count the marks on a ruler to see whether 10 marks are actually making up 1 cm.

P 10 marks make up 1 cm. 1 cm is divided into 10 smaller marks.

T/P Read and explain the important point in the [ ]. If time allows, practice writing 1 mm.

6 Learn about how to use 1 mm.

T Explains to pupils that the length of the stick is 7 cm and two 1 mm, so it can be described as 7 cm 2 mm.

P In pairs use a ruler to identify the measurement of the stick.

T Confirms with pupils the relation that 1 cm = 10 mm.

7 Learn about how to measure the length of the stick using a ruler.

T Teacher explains to pupils that 7 cm 2 mm is read as "seven centimetres and two millimetres".

CONCLUSION

8 Summary.

T/P Summarise the lesson by confirming pupils' understanding of the main ideas in the lesson.

Due to space limitations, the Teacher's Notes and Sample Blackboard Plan are placed on page 138.

Unit 6: Unit: Lengths

Sub-unit: 2. How to Represent Lengths

Lesson 4 of 4

Textbook Page : p.80~81
Actual Lesson 053

Lesson Objectives

- To measure the lengths of tapes and lines by using a ruler and also to draw various lines of different lengths as specified.
- To understand how to convert different units of measurement.

Prior Knowledge

- Understand that the unit “cm” can be divided into 10 to get smaller units when objects cannot be measured in exact centimetres.
- Understand the use of rulers in measuring smaller units.
- Understand and learn that 1 cm = 10 mm

Preparation

- 30 cm ruler and A4 paper

Assessment

- Measure the lengths of tapes and lines by using a ruler. F S
- Draw accurately and confidently various lines of different lengths. F S
- Convert different units of measurement. F S

Lesson Flow

INTRODUCTION

1 Review.

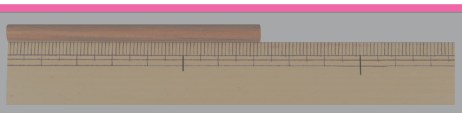
T/P Review key ideas from the previous lesson.

BODY

2 Introduce the main task.

T Introduce and explain the main task, “Let’s draw lines using a ruler”.

3 Pupils measure the lengths of tapes and lines in different lengths.



The length of the stick is 7 cm 2 mm.

We can read this as “seven centimetres and two millimetres”.

4th lesson

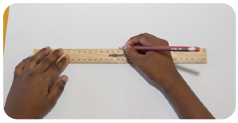
6 Let’s measure the lengths of the tapes and lines shown below. Measurement of lengths using “mm”

1. 4 cm 5 mm
2. 12 cm 2 mm
3. 6 cm 6 mm
4. 9 cm 7 mm

How to draw lines with a ruler

7 Let’s draw lines of the following lengths.

1. 8 cm
2. 11 cm 5 mm
3. 15 cm 8 mm



① Draw two points.



② Draw a line between the two points.

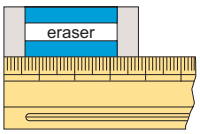
Exercise

Guess the lengths of various objects, and then measure them.



80 = □ + □

8 Measure the length of the side of an eraser. Unit conversion in length



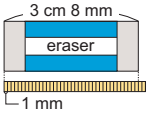
1. How many cm and mm is it? 3 cm 8 mm
2. How many mm is it?

Ⓐ 3 cm = 30 mm, so if we add 8 mm to it, we will get 38 mm.

3 cm 8 mm = 38 mm

3 cm	8 mm
3	8 mm

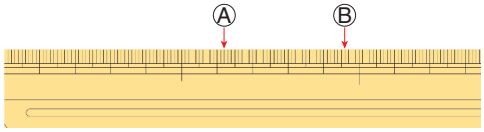
Ⓑ



There are 38 of 1 mm units, so it will be 38 mm.

Exercise

What are the lengths from the left edge of the ruler below to Ⓐ and Ⓑ in terms of centimetre and millimetre? How long are they in mm?



Ⓐ 6 cm 2 mm = 62 mm

Ⓑ 9 cm 6 mm = 96 mm

4th lesson

□ − □ = 81

Lesson Flow

T/P 6 Let's measure the lengths of the tapes and lines in the problem and write the measurements on your notebooks.

T/P 1) 4 cm 5 mm. 45 mm. 2) 12 cm 3 mm, 123 mm 3) 6 cm 5 mm, 65 mm 4) 9 cm 6 mm, 96 mm

TN Explain to pupils that the description "45 mm" is also correct, it can be read as 4 cm and 5 mm which is the same as 45 mm.

4 Practise drawing lines of different lengths.

T 7 Let's draw lines of the following lengths. Demonstrates to pupils how to measure accurately, to put their hands firmly on a ruler and not to move it while drawing lines.

TN Show a good example and bad example of how to place a pencil to a ruler. It is important to explain this to pupils as lines will not be straight if one does not properly place a ruler and pencil.

P Practise drawing lines of lengths 1-3.

5 Exercise.

T Guess the lengths of various objects, and then measure them. Draw a table and insert your findings and complete the exercise.

TN Remind pupils to work as a group to estimate lengths and share the actual lengths after the measurement.

6 8 Measure the length of the longer side of the eraser.

T 1 What is the length of the eraser in the problem?

P It's 3 centimetre and 8 millimetres.

T 2 How many "mm" is it?

P Expected responses:

1. 1 cm is 10 mm. 3 cm is 30 mm, so if we add 8 mm to it, we will get 38 mm.
2. When I counted the millimetre marks of the ruler, there were 38 marks, so it is 38 mm.

TN Reinforce the understanding to all pupils by utilising the unit conversion of applying the rule 1 cm = 10 mm to covert the length from cm to mm as basic unit.

7 Exercise.

P Complete the exercise.

T/P Practice measuring the lengths with a ruler and also practice unit conversion.

TN Emphasise the conversion of units for pupils to understand that they are using the different units of measurement to measure the same length.

CONCLUSION

8 Summary.

T/P Summarise the lesson by confirming pupils' understanding of the main ideas in the lesson.

Due to space limitations, the Teacher's Notes is placed on pages 138-139.

Sample Blackboard Plan

Date: **Chapter 6** : Lengths **Sub-chapter 2:** How to Represent Lengths **Lesson** 4 of 4

Main Task: Let's draw lines using a ruler.

Review

- 1 millimetre is written as _____.
- _____mm = 1 _____.

Activities

6 Let's measure the lengths of the tapes and lines shown below.



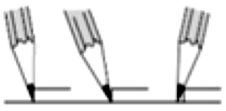
7 Let's draw lines of the following lengths.

① 8 cm ② 11 cm 5 mm ③ 15 cm 8 mm

How to draw lines with a ruler.

- Use the marked side of the ruler and put two dots for the given length.
- Use the unmarked side of the ruler to draw a line between the two dots.
- Put a hand firmly on the ruler and do not move it while drawing a line.

How to place a pencil to a ruler



8 ① 3 cm and 8 mm

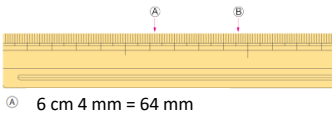
② How many mm is it?

Ⓐ 3 cm = 30 mm, so if we add 8 mm to it, we will get 38 mm.

3 cm 8 mm = 38 mm

Ⓑ There are 38 of 1 mm units, so it will be 38 mm

Exercise



Ⓐ 6 cm 4 mm = 64 mm

Ⓑ 9 cm 6 mm = 96 mm

Summary

- We can measure lengths of different objects using a ruler.

Unit 6

Unit: Lengths
Sub-unit: 3. Metres
Lesson 1 of 2

Textbook Page : p.82~83
Actual Lesson 054

Sub-unit Objectives

- To learn about the unit "m" and the conversion 1 m = 100 cm.
- To measure the lengths of various objects and write them with compound numbers.
- To choose the most appropriate ruler based on an object.

Lesson Objectives

- To learn about the unit "m".
- To understand the conversion 1 m = 100 cm.

Prior Knowledge

- Measure lengths of different objects using a ruler and the unit conversion.

Preparation

- 30 cm ruler, 1 m ruler, paper tape

Assessment

- learn about the unit "m". F S
- Understand the conversion of 1 m = 100 cm. F S

Lesson Flow

INTRODUCTION

1 Review.

T/P Review key ideas from the previous lesson.

BODY

2 Introduce the main task.

T Introduce and explain the main task, "Let's measure the length of the toy car when it moves".

3 Read and understand the situation of the lengths of the toy that moved.

1st lesson

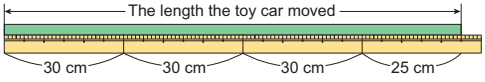
Metres

We played a racing game using toy cars that move forward.



"m" as a unit of measurement, unit conversion in length

1 Karen measured how far her car moved by tracing the length using a tape. She measured three times with the 30 cm ruler, and had 25 cm more.

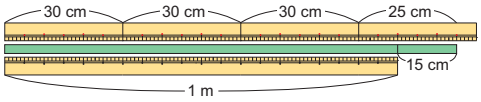


By how many cm did the toy car move forward?

30 + 30 + 30 + 25 = 115 Answer: 115 cm

100 cm is called 1 **metre**, and is written as 1 **m**. Metre (m) is another unit of length.

1 m = 100 cm



It is useful to use a 1 m ruler when measuring long objects.

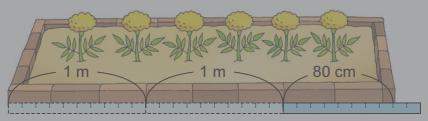
115 cm = 1 m 15 cm

m		cm	
	1	1	5

1st lesson

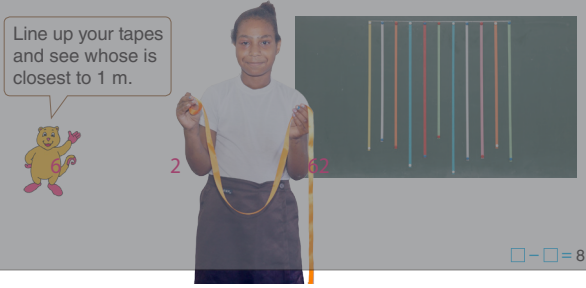
2 We measured the length of a flower bed as follows. How many metres and centimetres is the length?

How many centimetres is it?



Exercise

Let's cut a tape that you think is 1 m long.



82 = □ + □

□ − □ = 83

Lesson Flow

T ▶▶ Let's measure the length the toys moved.

P Look at the picture on p. 82 and discuss what the children are doing.

T Introduce the problem, and tell pupils to get information about the length which Karen's toy moved.

TN Divide pupils into groups and ask each group to cut a paper tape to the length described in the problem.

P Measure the length of the paper tape.

4 Present their findings.

T 1 How many cm did the toy car move forward?

P 30 cm + 30 cm + 30 cm + 25 cm = 115 cm

P Realise that they can measure it more accurately if they have a longer ruler.

5 Learn about the unit "metre (m)".

T/P Read and explain the important point in the .

P Understand the idea of 1 metre through a hands-on experience.

6 Change the length written in "cm" to "m".

T Introduce the use of a place value chart to have pupils understand the conversion between "cm" and "m".

P Change the length from 115 cm = 1 m 15 cm

TN Explain to pupils that the length they get when they extend their arms out to the side is almost the same as their height.

Based on this knowledge, pupils can measure and compare the lengths of various objects using their bodies.

Through hands-on experience, they should be able to acquire a clear image of the length, 1 m.

CONCLUSION

7 Summary.

T/P Summarise the lesson by confirming pupils' understanding of the main ideas in the lesson.

Due to space limitations, the Teacher's Notes is placed on page 139.

Sample Blackboard Plan

Date: **Chapter 6** : Lengths **Sub-chapter 3:** Metres **Lesson** 1 of 2

Main Task: Let's measure the length of the toy car when it moves.

Review

There are 38 of 1 mm units.

1. How many mm?
2. How many cm and mm?

Activities

▶▶ We played a racing game using toys that moved forward and measure the length of how far the toys moved.

•With a 30cm ruler, we cannot get accurate measurements.

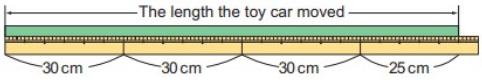
•We cannot join a ruler properly without a space.

•We cannot keep the tape straight.

1 Karen measured how far her car moved by tracing the length using a tape. She measured three times with the 30 cm ruler and had 25 cm more.

By how many cm did the toy car move forward?

30 cm + 30 cm + 30 cm + 25 cm = 115 cm

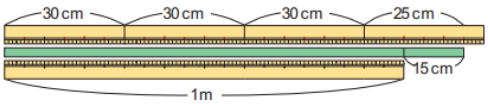


Important Point

100 cm is called 1 metre, and is written as 1 m.

Metre (m) is another unit of length.

1 m = 100 cm



It is useful to use a 1m ruler when measuring long objects.

115 cm = 1 m 15 cm

m	cm	
1	1	5

Summary

•Metre (m) is another unit of length.

• It is useful to use 1 m ruler when measuring long distance.

Unit 6

Unit: Lengths
Sub-unit: 3. Metres
Lesson 2 of 2

Textbook Page : p.83
Actual Lesson 055

Lesson Objective

- To describe the lengths measured with a 1 m ruler in simple concrete numbers as well as in compound numbers.

Prior Knowledge

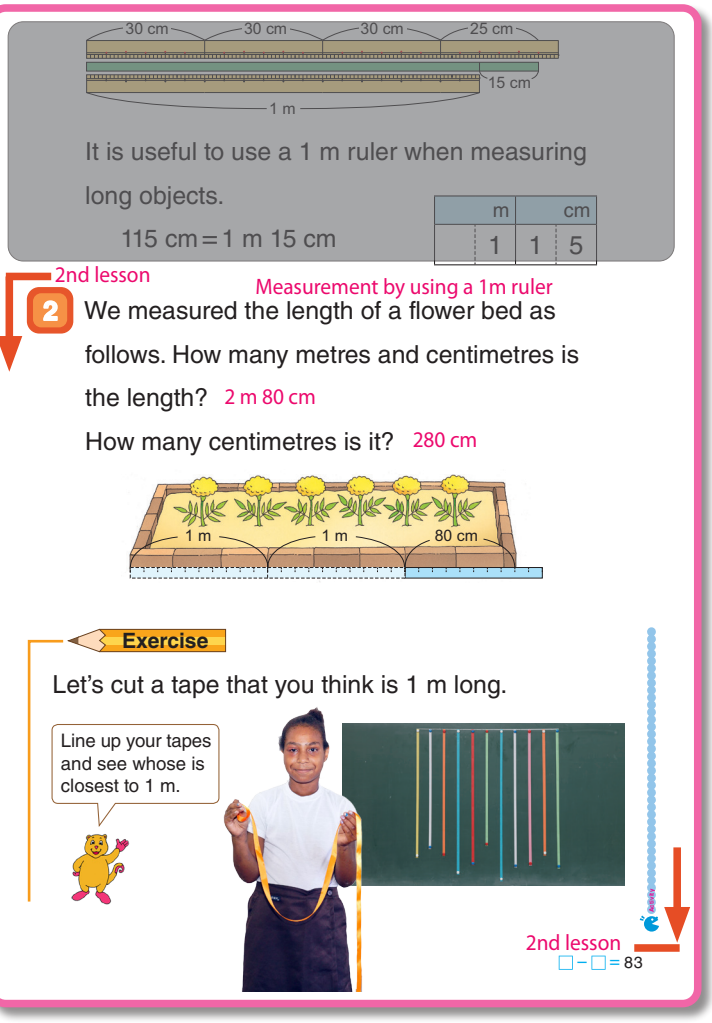
- Measure lengths of different objects using a ruler and the unit conversion.

Preparation

- 1 m ruler, recording sheets

Assessment

- Describe the lengths measured with a 1 m ruler in simple concrete numbers as well as in compound numbers. F S



Teacher's Notes

Identify the millimetres.

Millimetres are subunits that make up the meter. In the metric row on the tape measure, millimetres are the smallest markings and are not labeled. 10 millimetres make up 1 centimetre—this means you will see 9 millimetre lines between each centimetre number on the tape measure, since the 10th millimetre line is the next centimetre number. [4]

- For example, you should see 9 shorter lines between "5" and "6."

Look for the centimetres.

Centimetres are the next sub-unit leading up to the metre. They are the large and numbered markings on the metric row. You will also see a slightly longer line halfway between the centimetre makings. This line indicates the half centimetre, which is made of 5 millimetres. It is longer than the other millimetre lines, but shorter than the centimetre lines. It is also not usually labeled. [5]

- For example, you should see a slightly longer line between "3" and "4." This stands for 3 centimetres and 5 millimetres, giving you 3.5 centimetres.

Find the metres.

1 metre is made of 100 centimetres. That means that every 100-centimetre line, you should see the metre marked down.

- For example, you should see a label for 3 meters after 300-centimetre lines.

If your measurement is more than 100 centimetres, you have already read the tape in metres! For example, if you measured 205-centimetre lines, you should have already recorded 2.05 meters and can stop here—there's no need to make a conversion.

Lesson Flow

INTRODUCTION

1 Review.

T/P Review key ideas from the previous lesson.

BODY

2 Introduce the main task.

T Introduce and explain the main task: "How many metres and centimetres are the width of the flower bed?"

3 Read and understand the situation and solve.

T 2 How many metres and centimetres is the width of the flower bed?

TN Describe the width of a flower bed in two different units (compound number) as well as in single unit (simple concrete number).

P 2 m 80 cm, 280 cm

TN It is important to emphasise and confirm the understanding by revisiting the basics that "1 m = 100 cm" "1 m + 1 m = 2 m" and "2 m = 200 cm, " Also, that 1 m and 1 m becomes 2 m and also that 2 m 80 cm becomes 280 cm.

4 Exercise.

T/P Do the exercise

TN It is important for pupils to estimate the length/ width of 1 m and acquire the sense of 1 m.

P In pairs estimate the tape's length/width of 1 m and acquire the sense of 1 m.

T Confirms their answers.

5 Measure the lengths of objects in the school by using 1 m rulers.

TN If possible, Teacher can incorporate activities for pupils to go outside the classroom and practice measuring the lengths of various objects. Careful attention should be paid, however, to the safety of pupils.

P Present the results of the activity to their friends in class together.

TN Teacher not only invites the measurement results from pupils but also does the observations pupils had during the activity; for example, good points as well as difficulties in using a 1 m ruler and confirms students understanding.
Teacher can pick up comments from pupils that they come across longer objects they could not measure with a 1 m ruler. It can be linked to the next lesson on a long tape measure.

CONCLUSION

6 Summary.

T/P Summarise the lesson by confirming pupils' understanding of the main ideas in the lesson.

Sample Blackboard Plan

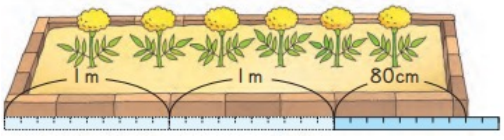
Date: **Chapter 6** : Lengths **Sub-chapter 3:** Metres **Lesson** 2 of 2

Main Task: How many metres and centimetres are the width of the flower bed?.

Review

100 cm is called _____and is written as_____.

_____(m) is another unit of length.



- 1 m + 1 m + 80 cm = 2 m 80 cm
- 1 m + 1 m + 1 m – 20 cm = 2 m 80 cm
- 300 cm – 20 cm = 280 cm

- Measure the length of 3 objects using a 1 m ruler.

Object	Length	
1.	m	cm
2.	m	cm
3.	m	cm

Activities

2 We measured the length of a flower bed as follows. How many metres and centimetres is the length?

Exercise

Let's cut up a tape that you think is 1 m long.

Summary

•Width of the flower bed is 1 m and 1 m becomes 2 m and also 2 m 80 cm becomes 280 cm.

Unit 6: Unit: Lengths

Sub-unit: 4. Let's Find the Lengths

Lesson 1 of 3

Textbook Page : p.84
Actual Lesson 056

Sub-unit Objective

- To understand the rules and ways of addition in length and to calculate addition and subtraction of simple lengths.

Lesson Objectives

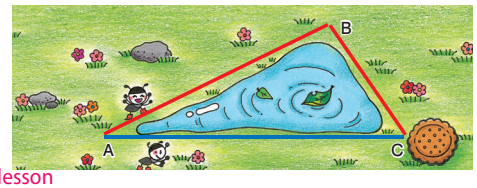
- To understand the rules and ways of addition in length.
- To understand how to calculate simple addition and subtraction in length.

Prior Knowledge

- Measure lengths of different objects using a ruler and the unit conversion.
- Describe the lengths measured with a 1 m ruler in simple concrete numbers as well as in compound numbers.

Preparation

- 30 cm ruler, tapes of 30 cm ruler.



1st lesson

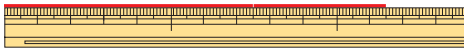
Let's Find the Lengths

Rules of addition in length, how to add and subtract lengths

1 An ant crawled from A to C.

(1) What is the total length of the lines A B C?

7 cm 5 mm + 4 cm



Vavi's idea

I will add lengths with same units together.
7 cm and 4 cm make 11 cm
11 cm and 5 mm make 11 cm 5 mm.

Naiko's idea

cm	mm
7	5
+ 4	
11	5

(2) What is the difference between the lengths of the lines A B C and A C?

Measure and find the difference.

cm	mm
11	5
- 9	
2	5



11 cm 5 mm - 9 cm = 2cm 5 mm
Answer: 2 cm 5 mm



Exercise

1 An 18 cm elastic band was stretched to the length of 35 cm. How much was it stretched?

35 cm - 18 cm = 17cm
Answer: 17 cm

2 Let's find the answers.

① 12 cm + 25 cm
37 cm

② 23 cm 6mm − 16 cm
7 cm 6 mm

1st lesson

84 = □ + □

Assessment

- Understand the rules and ways of addition in length. F S
- Understand how to calculate simple addition and subtraction in length. F S

Teacher's Notes

Addition and Subtraction of Lengths

In the learning of calculating lengths, it is important that pupils explore various ways of calculations as well as the rationale for selecting either addition or subtraction.

1 (1) <Meaning of make math sentence>
To identify the total length, we should use addition.
<Various ways of calculations>
By calculating 7 cm 5 mm + 4 cm = 11 cm 5 mm
By counting marks of a ruler for the given lengths
By calculating in vertical form, etc.

(2) <Meaning of make math sentence>
To identify the difference in length, we should use subtraction.
<Various ways of calculations>
By calculating 11 cm 5 mm − 9 cm = 2 cm 5 mm
By counting marks of a ruler for the given lengths
By calculating in vertical form, etc.

The rules of addition in quantity

The condition of adding quantities is that quantities to be added should be represented in the same units. This rule becomes a basis for transferring, transforming, combining and splitting quantities.

Lesson Flow

INTRODUCTION

1 Review.

T/P Review key ideas from the previous lesson.

BODY

2 Introduce the main task.

T Introduce and explain the main task: "Let's add and subtract lengths?"

3 ① Identify the total length of the red line, ABC.

T ① How long do you think is the red line drawn from A to B to C?

P Possible responses-Utilising Vavi's idea.

- We can add the lengths of the two red lines to find out.
- Let's measure the lengths of these two red lines first.
- We can do 7 cm 5 mm + 4 cm.
- We made a math expression, but how can we calculate it?
- Which one and which one should be added?

T Let's think about how to calculate these lengths.

P Possible responses: Utilising Naiko's idea.

- I think we can add the ones with the same units.
- If we change "cm" to "mm," we will have 75 + 40.
- I think it is easier to think "cm" and "mm" separately. We can do 7 cm + 4 cm = 11 cm.

TN Advise pupils to look at the picture of a ruler and the two red lines combined (the lines from A to B and from B to C) on p.84 to check the total length of the lines.

By referring to it, let pupils compare it with their own answer and reinforce the rule that "cm" and "mm" should not be added together.

4 Compare the lines ABC and AC, and identify the difference in length.

T ② What is the difference between the lengths of lines ABC and AC?

P Possible responses:

- 11 cm 5 mm − 9 cm.
- As we did in the previous addition calculation, we have to calculate "cm" and "mm" separately.
- 11 cm − 9 cm = 2 cm, so the difference is 2 cm 5 mm.
- We can add and subtract lengths as long as they are in the same units.

T Confirm pupils understanding.

5 Exercise.

P Do the exercise.

T/P Correct the exercise and reinforce the rule of calculating lengths with the same unit.

CONCLUSION

6 Summary.

T/P Summarise the lesson by confirming pupils' understanding of the main ideas in the lesson.

Sample Blackboard Plan

Date: **Chapter 6** : Lengths **Sub-chapter 4:** Let's Find the Lengths **Lesson** 1 of 3

Main Task: Let's add and subtract lengths.

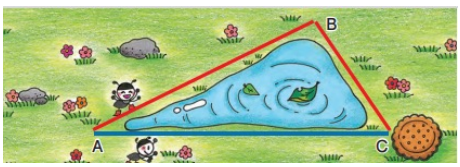
Review

100 cm is called _____and is written as_____.

_____(m) is another unit of length.

Activities

1 An ant crawled from A to C.



① What is the total length of the lines A B C?

7 cm 5 mm + 4 cm = 11 cm 5 mm

Or

	cm	mm
	7	5
+	4	
	11	5

11 cm 5 mm

② What is the difference between the lengths of the lines ABC and AC?

11 cm 5 mm – 9 cm = 2 cm 5 mm

Or

	cm	mm
	11	5
–	9	
	2	5

2 cm 5 mm

Exercise

1. 35 cm – 18 cm = 17 cm it stretched
2. ① 12 cm + 25 cm = 37 cm
   ② 23 cm 6 mm - 16 cm = 7 cm 6 mm

Summary

•To calculate lengths, add or subtract the same units.

Unit 6

Unit: Lengths
Sub-unit: 4. Let's Find the Lengths
Lesson 2 of 3

Textbook Page : p.85~86
Actual Lesson 057

Lesson Objectives

- To understand that lengths can be added and subtracted by applying carrying and borrowing with a conversion of 1 cm = 10 mm.
- To understand that addition and subtraction involving "m" can be possible in the same way.

Prior Knowledge

- Describe the lengths measured with a 1 m ruler in simple concrete numbers as well as in compound numbers.

Preparation

- 30 cm ruler, Tapes of 30 cm.

Assessment

- Understand that lengths can be added and subtracted by applying carrying and borrowing with a conversion of 1 cm = 10 mm. F S
- Understand that addition and subtraction involving "m" can be possible in the same way. F S

Lesson Flow

INTRODUCTION

1 Review.

T/P Review key ideas from the previous lesson.

BODY

2 Introduce the main task.

T Introduce and explain the main task: "Let's think about how to calculate the lengths."

3 2 Think of how to solve problem Ⓐ and Ⓑ.

T Advise pupils to compare these two problems with the calculations we did in the previous lessons.

P Compare the presented problems with the ones from the previous lessons and identify the differences.

TN Teacher then have them to think about how they can calculate this time.

4 1 Explain ideas and calculations.

2nd lesson

2 Let's think about how to calculate the following.
How to add lengths with carrying and subtract lengths with borrowing
Ⓐ 16 cm 8 mm + 1 cm 5 mm
Ⓑ 18 cm 4 mm − 2 cm 6 mm

1 Explain the ideas for Ⓐ below, and complete the calculation.

Kekeni's idea

16 cm 8 mm is 168 mm.
1 cm 5 mm is 15 mm.
Therefore, the problem can be solved by doing 168 + 15.

168 + 15 = 183
183 mm = 18 cm 3 mm

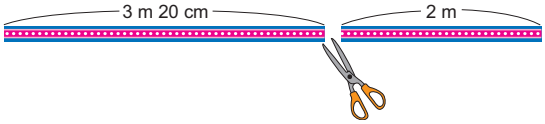
Mero's idea

16 cm + 1 cm = 17 cm.
8 mm + 5 mm = 13 mm.
Therefore, the problem can be solved by doing 17 cm + 1 cm 3 mm.

17 cm + 1 cm 3 mm = 18 cm 3 mm

2 Let's calculate Ⓑ using Kekeni's and Mero's ideas.
Kekeni: 184 - 26 = 158
158 mm = 15 cm 8 mm
Mero: 18 cm - 2cm = 16 cm, We cannot do 4mm − 6mm.
14 mm - 6 mm = 8 mm 15 cm 8 mm

3 A tape was cut into two pieces. The lengths of the two pieces are shown below.
Addition and subtraction of lengths



1 What was the original length of the tape?

3 m 20 cm + 2 m = 5 m 20 cm

□ − □ = 85

Kekeni's idea

I will add the numbers with the same units with each other.
3 m and 2 m make 5 m.
5 m and 20 cm make 5 m 20 cm.

Mero's idea

m	cm
3	2 0
+ 2	
5	20

2 What is the difference between the lengths of the two tapes? 3 m 20 cm - 2 m = 1m 20cm
Answer; 1 m 20 cm

Exercise

1 There is a rope 13 m long and a rope 2 m long. How many metres is the difference between the two ropes? 13 - 2 = 11 Answer; 11 m

2 Let's find the answers.

① 13 cm 7 mm + 2 cm 3 mm 16 cm
② 26 cm 3 mm − 4 cm 5 mm 21 cm 8 mm
③ 24 m + 15 m 39 m
④ 23 m 50 cm − 15 m 8 m 50 cm

1st lesson

Tape Measure

Write scales for 1 cm, 10 cm, and 1 m in different colours.

4 Make a long ruler with a paper ribbon, and measure the lengths of many different objects.



1 First, guess their lengths.
2 Then, measure the lengths to prove the actual lenght.

86 = □ + □

Lesson Flow

T Let's think about how to calculate problem Ⓐ.
P Firstly, think on their own and then refer to the ideas of Kekeni and Mero introduced on p.85.
T Confirm with pupils that when the units are not the same, lengths cannot be added or subtracted.
P ② For problem Ⓑ, use the ideas of Kekeni and Mero.
T Allow pupils to finish solving the problems and explain their answers.

5 ③ Find out the original length of the tape.

T ① What was the original length of the tape before it was cut?
P Realise that the two lengths involving "m" can be added in the same way they added "cm" and "mm".
P Realise that to find the original length, the two different lengths should be added; thus the expression 3 m 20 cm + 2 m.
T Draws pupils' attention to the ideas of Kekeni and Mero.What can you see from the lengths?
P Recognise that both of them add lengths with the same units.
T Reinforce to pupils that the lengths with different units should not be added or subtracted.
TN Do a demonstration using a long tape that has been cut. First show pupils two separate tapes and then put them together as shown in the textbook. Such a demonstration can help pupils gain a better understanding of the situation.

6 ② Identify the difference in lengths between the two tapes.

T In terms of the length, what do you think is the difference between these two tapes?
TN Confirm with pupils that the length of the shorter tape has to be subtracted from that of the longer tape, and make a math expression 3 m 20 cm − 2 m.
P Refer to how Kekeni and Mero's calculation was done in the previous problems and solve the identified subtraction problem in similar ways.
TN Do a demonstration using two pieces of tape where one piece is placed on the other and measure the part where the two are not overlapping with each other.
This demonstration can help pupils have a better understanding of the situation.

7 Exercise.

P Do the exercise.
TN In the first word problem, judging from the word "difference", Ask pupils to make an expression using subtraction.
TN Carefully check their vertical calculations in their exercise books and the blackboard.
T/P Correct the exercise.

CONCLUSION

8 Summary.

T/P Summarise the lesson by confirming pupils' understanding of the main ideas in the lesson.

Due to space limitations, the Teacher's Notes is placed on page 128.

Sample Blackboard Plan

Date: **Chapter 6** : Lengths **Sub-chapter 4:** Let's Find the Lengths **Lesson** 2 of 3

Main Task: Let's think about how to calculate the lengths.

Review

Calculate
1. 23 cm 6 mm – 16 cm
2. 7 cm 5 mm + 3 cm

Activities

2 Let's think about how to calculate the following.
Ⓐ 16 cm 4 mm + 1 cm 5 mm
Ⓑ 18 cm 4 mm – 2 cm 6 mm

① Ⓐ Kekeni's Idea
168 mm + 15 mm = 183 mm
① Ⓐ Mero's Idea
16 cm + 1 cm = 17 cm
8 mm + 5 mm = 13 mm
So 17 cm + 1 cm + 3 mm = 18 cm 3 mm
② Ⓑ Kekeni's Idea
184 mm – 26 mm = 158 mm
② Ⓑ Mero's Idea
18 cm – 2 cm = 16 cm
4 mm – 6 mm = cannot
Took 1 cm from 16 cm. 1 cm = 10mm
10 mm + 4 mm = 14 mm
14 mm – 6 mm = 8 mm
So 16 cm – 1 cm + 8mm= 15 cm 8 mm

3 ① original length of the tape is 3 m 20 mm + 2 m

Kekeni's Idea
3 m + 2 m = 5 m
Add 20 cm to 5 m
It is 5 m 20 cm

Mero's Idea

m	cm
3	20
+ 2	
5	20

② The difference. 3 m 20 cm – 2m = 1 m 20 cm

Exercise Write the exercise and answers here.

Summary

•To calculate lengths, we have to add or subtract the lengths with the same units.

Unit 6

Unit: Lengths
Sub-unit: 4. Let's Find the Lengths
Lesson 3 of 3

Textbook Page : p.86
Actual Lesson 058

Lesson Objective

- To make a long tape measure using a paper tape and measure the lengths of objects by using it.

Prior Knowledge

- Let's find the Length
- Add and Subtract Lengths with same units.

Preparation

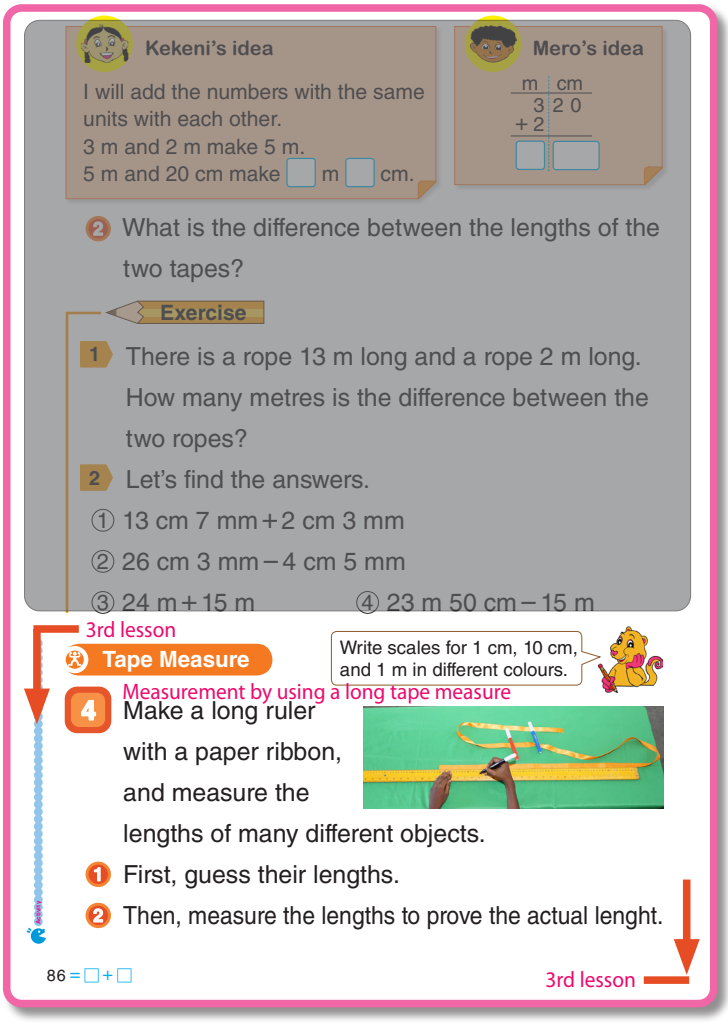
- 1 m ruler, rolls of long paper tape or glued A4 paper (or long pieces of clothes)

Assessment

- Confidently construct a long tape measure and measure lengths of objects by using it. F S

Teacher's Notes

In this lesson, pupils are expected to make their own tape measures to conveniently measure longer lengths.
Teacher needs to ensure there is close supervision in the construction of their tape measures for accuracy of measurement. It would be best for the teacher to assist pupils with the construction of 1 metre tape measure and then allow pupils the extend the lengths to the desired length using the experience.
Note:
For consistent and reliable results, measurements need to be accurately indicated on the tape measures.



p.126 Teacher's Notes

When writing in vertical form, prepare columns by unit and write numbers according to the units.

m	cm
3	20
+2	
5	20

- Calculate in the same units.

Regarding the last point, it would be effective for pupils to actually experience what will happen when they add or subtract in the different units (i.e. 3 m 22 cm), and compare the results with the actual lengths they identify using concrete objects (5 m 20 cm). Manipulation of concrete objects can help deepen their understanding.

Lesson Flow

INTRODUCTION

1 Review.

T/P Review key ideas from the previous lesson.

BODY

2 Introduce the main task.

T Introduce and explain the main task: "Let's make a tape measure that will measure longer objects".

3 Think of making a tape measure that is 2 metres or 3 metres long.

T 4 Think of ways to measure longer objects and the difficulties they experienced in using a ruler which was shorter than the objects.

TN Remind pupils of the difficulties considering that:

(a) rulers cannot be jointed properly, and

(b) measuring the lengths of round objects is difficult with a straight ruler.

P In pairs discuss how they think can help them develop ways to make a tape measure with paper tape.

T Explain and help the pupils decide on the length of the tape measure.

TN Instruct them to use different colors for the marks for 1 cm, 10 cm and 1 m.

P Work in groups to make tape measures of 1or 2 metres using a paper tape or ribbon.

TN Through this activity, pupils are expected to deepen their understanding of what they have already learnt including various different units of lengths.

4 Measure the lengths of various objects by using a tape measure.

TN Guide pupils to either use both a 1 m ruler and a tape measure every time they measure an object.

P 1 First, guess their lengths and,

P 2 Then, measure the lengths to prove the actual length.

TN Remind pupils to write the lengths in a single unit (simple concrete number) and in two different units (compound number).

T/P Confirm the results of the activity and discuss their findings with the class.

CONCLUSION

5 Summary.

T/P Summarise the lesson by confirming pupils' understanding of the main ideas in the lesson.

Sample Blackboard Plan

Date: **Chapter 6** : Lengths **Sub-chapter 4:** Let's Find the Lengths **Lesson** 3 of 3

Main Task: Let's make a tape measure that will measure longer objects.

Review

Calculate 16 cm 4 mm + 1 cm 5 mm using Mero's idea.

Activities

4 Make a longer ruler with a paper ribbon and measure the lengths of many different objects.

① First Guess their lengths.

② Then measure the lengths to prove the actual length.

❑ Good ideas for making a good tape measure.

- Use a paper tape or piece of cloth that is soft and flexible.
- Put the measurement marks on the correct places.
- Change the colours of marks for 1 cm, 10 cm and 1 m.

Eg ❑ What we measured..

Object	Estimated length	Actual length
Height of desk	80 cm	72 cm
Height of chair	50 cm	35 cm
Length of shoes	32 cm	26 cm

Summary

•We should select and use an appropriate ruler or measure according to what we are measuring.

Unit 6

Unit: Lengths
Exercise
Lesson 1 of 1

Textbook Page : p.87
Actual Lesson 059

Sub-unit Objective

- To understand the rules and ways of addition in length and to calculate addition and subtraction of simple lengths.

Lesson Objective

- To deepen the understanding of what has been learnt.

Prior Knowledge

- Grade 1, Chapter 13 Comparing Sizes

Preparation

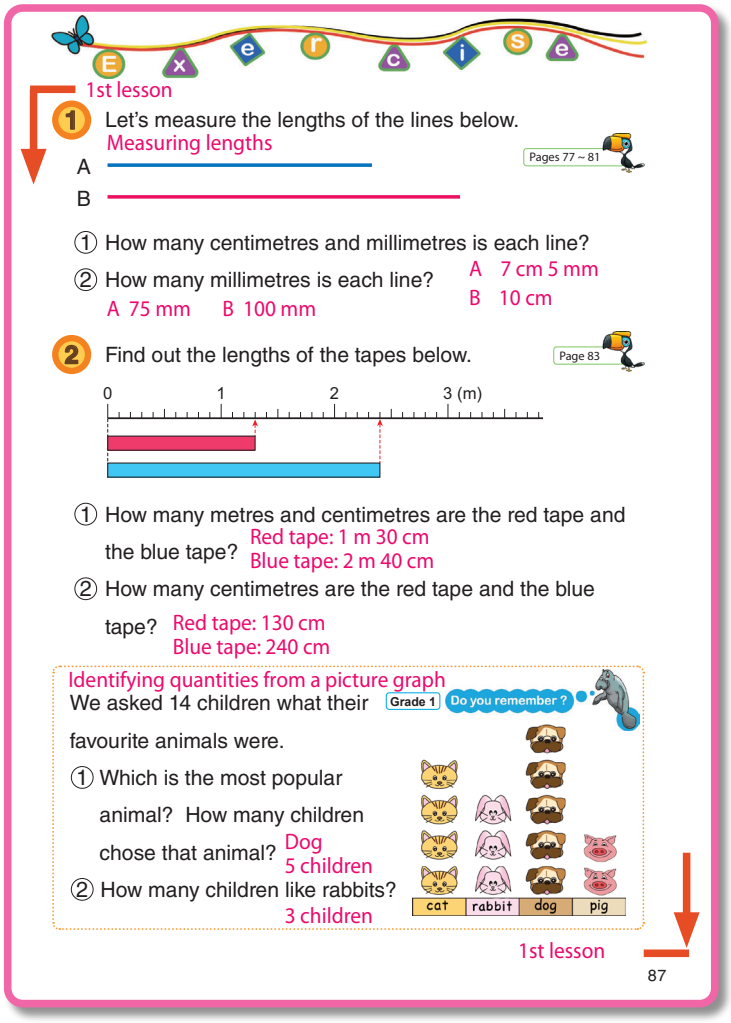
- 1 m ruler, rolls of long paper tape A4 paper (or long pieces of clothes)

Assessment

- Do all the exercise correctly. F S

Teacher's Notes

Pupils enjoy this activity of making a tape measure with a long tape and measuring the lengths and heights of various objects. This activity can deepen their understanding of lengths and also enrich their sense of the lengths and sizes.
In this activity, it is important that pupils realise the usefulness of a tape measure which enables them to measure objects in one time and with accuracy. Teacher can allocate time for discussion in lessons in which pupils can talk with each other and identify the advantages of a tape measure.



Exercise

1st lesson

1 Let's measure the lengths of the lines below.
Measuring lengths
Pages 77 ~ 81

A
B

① How many centimetres and millimetres is each line?
② How many millimetres is each line?
A 75 mm B 100 mm
A 7 cm 5 mm
B 10 cm

2 Find out the lengths of the tapes below.
Page 83

0 1 2 3 (m)

① How many metres and centimetres are the red tape and the blue tape? Red tape: 1 m 30 cm Blue tape: 2 m 40 cm
② How many centimetres are the red tape and the blue tape? Red tape: 130 cm Blue tape: 240 cm

Identifying quantities from a picture graph
We asked 14 children what their favourite animals were.
Grade 1 Do you remember ?

① Which is the most popular animal? How many children chose that animal? Dog 5 children
② How many children like rabbits? 3 children

cat rabbit dog pig

1st lesson

87

EXERCISE

① Measuring the length of lines.

T Let's measure the lengths of the lines A and B.

P Measure the lengths of lines in;
① cm and mm
② mm

② Finding out the lengths of the tapes.

T Guide pupils to describe the presented lengths in ① compound numbers (using "m" and "cm") and in ② simple concrete number (using "cm").

TN For pupils who cannot tell whether one mark indicates 1 cm or 10 cm, Teacher can explain to them by using concrete objects; for example, prepare a chart that shows 1 m divided into ten pieces. By showing ten of 10 cm pieces forming 1 m, pupils can get a better idea about what each mark indicates on the presented number line.

P Find the lengths of the red and blue tapes respectively.

TN Affirm pupils' understanding on how to measure lengths easily.

Do you remember?

P Complete the exercises.

Sample Blackboard Plan

Date: **Chapter 6** : Lengths **Exercise** **Lesson** 1 of 1

① Let's measure the lengths of the lines below.

A

B

① How many centimetres and millimetres is each line?

② How many millimetres is each line?

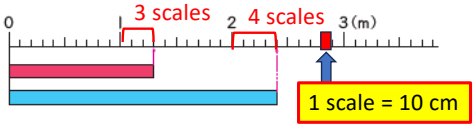
Use ruler to measure the lines.

① A. 7 cm 5 mm. B. 10 chm

1 cm = 10 mm

② A. 75 mm. B. 100 mm

② Find out the lengths of the tapes below. Page 83



① Red tape: 1 m 30 cm Blue tape: 2 m 40 cm

② Red tape: 130 cm Blue tape: 240 cm

1 m = 100 cm

We asked 14 children what their favourite animals were.

Grade 1 Do you remember?

① Which is the most popular animal? How many children chose that animal?

② How many children like rabbits?



Animal	How many children chose
cat	4
rabbit	3
dog	5
pig	2

① Most popular animal: dog

② Rabbit : 3 children

Unit 6

Unit: Lengths
Problems 1 and 2
Lesson 1 of 1

Textbook Page : p.88~89
Actual Lesson 060

Sub-unit Objective

- To understand the rules and ways of addition in length and to calculate addition and subtraction of simple lengths.

Lesson Objectives

- To review what has been learnt.
- Through an activity of finding the shortest way to the measure, to practice and master the use of rulers and addition of lengths.

Prior Knowledge

- Grade 1, Chapter 13 Comparing Sizes

Preparation

- 1 m ruler, 1 meter Tape measure made from long pieces of clothes or A4 papers.

Assessment

- Do Problem and Problem correctly. F S

Teacher's Notes

For Problems 1 and 2, Problem 1 can be given to pupils as homework and checked quickly during the lesson while Problem 2 can be done during the lesson for pupils' problem-solving practices. 1 and 2 should be done within one period.

Lesson Flow

PROBLEMS 1

1 Write the correct units in the ☐.

P Select and write an appropriate unit of length to measure each object.

TN With the first three problems, as they are available in the classroom, pupils can actually measure them to find the answers. The problem can be a little confusing since some

Problems 1

1st lesson

1 Identifying the appropriate units of length
Write the correct units in the ☐.

① The thickness of an exercise book. 3 mm
② The width of a classroom. 7 m
③ The length of a desk. 60 cm
④ The height of a school building. 20 m

2 Comparison of the lengths
Arrange the following lengths in order, from the longest.

3 m　　7 cm　　2 m 80 cm

3 m, 2m 80 cm, 7 cm

3 Measuring lengths
Let's find the answers.

① 7 cm 2 mm + 5 cm　12 cm 2 mm
② 23 cm 8 mm − 8 cm　15 cm 8 mm
③ 13 cm 4 mm + 2 cm 7 mm　16 cm 1 mm
④ 27 cm 5 mm − 5 cm 7 mm　21 cm 8 mm
⑤ 32 m 12 cm + 12 m　44 m 12 cm
⑥ 8 m 6 cm − 6 m　2 m 6 cm

4 Measuring and calculating lengths
Answer the following questions about the lengths of lines A and B.

A 

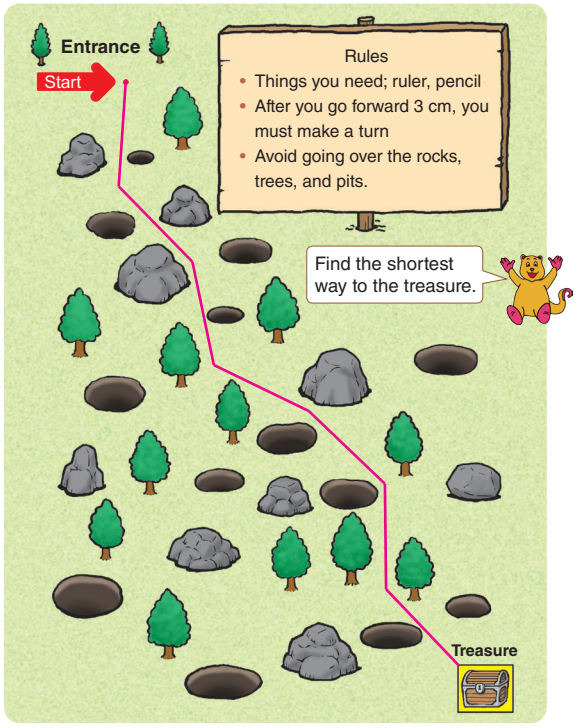
B

① Which is longer, A or B, and by how much?
8 cm 4 mm - 8 cm 2 mm = 2 mm　Answer: A is longer 2 mm
② If lines A and B are joined together, what will be its total length?
8 cm 4 mm + 8 cm 2 mm = 16 cm 6 mm　Answer: 16 cm 6 mm

88

Problems 2

1 Measuring lengths, how to draw straight lines
Draw lines according to the rules.



Find out the length of the route that you think is the shortest.

1st lesson

89

Lesson Flow

pupils may answer "cm" instead of "mm". The unit "mm" is not used so frequently in our daily lives to measure or indicate lengths, so it may not be easy for pupils to acquire the sense of "mm".

TN When thinking about the lengths of various objects around themselves, encourage pupils to utilise their sense of the lengths and sizes they have acquired in measuring exercises they did in the previous lessons.

② Arrange the following in order, from the longest to the shortest.

P Pupils arrange the presented lengths in order from the longest to the shortest.

③ Calculate addition and subtraction of lengths.

TN Advise pupils to be careful with the units used.

④ Measure the presented lengths.

Add and subtract the lengths to find the difference or the total length.

TN If the measurements of (A) and (B) are wrong, the following problems of ① and ② will be wrong automatically. Teacher can first check the answers for the problems (A) and (B), and allocate some more time to calculate the lengths for ① and ②.

Also, when checking answers or (A) and (B), carefully assess whether wrong answers are the results of small differences in their measurements or their misconception.

T Affirm pupils' understanding on how to measure lengths easily.

PROBLEMS 2

① Draw 3 cm lines to the treasure.

T Read the rules of the game carefully. Let's draw 3 cm lines and get to where the treasure is.

P Pupils open up the textbooks and draw lines.

TN Advise pupils to draw lines by avoiding going over the rocks, trees and pits, and repeat the rule that they have to make a turn every time they draw 3 cm lines.

② Find the shortest way to the treasure.

T Which one of you gets the shortest way to the treasure in this class? Let's measure the total length of your lines.

TN In this activity, pupils may come up with various routes. Tell them to compare the total length they have got by measuring or counting the total number of 3 cm lines, and identify who went the shortest way.

T Let them find the longest way to the treasure as an additional activity.

Sample Blackboard Plan

Date: **Chapter 6** : Lengths

Problem 1

① Write the correct units in the ☐.
① The thickness of a notebook. 3 mm
② The width of a classroom. 7 m
③ The length of a desk. 60 cm
④ The height of a school building. 20 m

② Arrange the following length in order, from the longest.
3 m 7 cm 2 m 80 cm
3 m , 2 m 80 cm , 7 cm

③ ① 7cm 2mm + 5 cm
7 cm + 5 cm = 12 cm Answer: 12 cm 2 mm
② 23 cm 8 mm – 8 cm
23 cm – 8 cm = 15 cm Answer: 15 cm 8 mm
③ 13 cm 4 mm + 2 cm 7 mm

	cm	mm
	13	4
+	2	7
	16	1

Answer: 16 cm 1 mm

Problems 1 and 2

④ 27 cm 5 mm – 5 cm 7 mm

	cm	mm
	27	5
—	5	7
	21	8

Answer: 21 cm 8 mm

⑤ 32 m 12 cm + 12 m

	m	cm
	32	12
+	12	7
	44	19

Answer: 24 m 19 cm

⑥ 8 m 6 cm — 6 m

	m	cm
	8	6
—	6	
	2	6

Answer: 2 m 6 cm

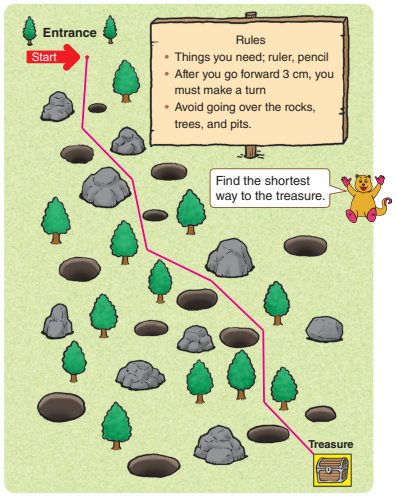
Lesson 1 of 1

④ A
B

A. 8 cm 4 mm
B. 8 cm 2 mm

① Line A is longer 2mm
② 16 cm 6 mm

Problem 2



Unit 6 Unit: Lengths
Review
Lesson 1 of 1

Textbook Page : p.90~91
Actual Lesson 061

Lesson Objective
- To discover 2-digit numbers and 3-digit number in real life experiences.

Prior Knowledge
- Addition and Subtraction

Preparation
- Picture of the stories.

Assessment
- Demonstrate the understanding of 2-digit numbers and 3-digit numbers in amount

Lesson Flow

REVIEW

1 Lesson 1.

P ① Understand how to count numbers larger than 100.

TN Teacher reinforces to pupils that they should count by making groups of 10.

P ② Tell the times on the clocks.

TN Assist pupils to identify the hour and the minute hand on the clock face.

P ③ Calculate addition in vertical form

TN Teacher advise pupils to write in the place in the same columns and remember to carry where necessary.

2 Lesson 2.

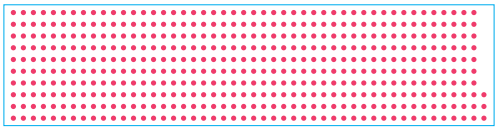
P ④ Calculate subtraction in vertical form.

TN Teacher advice pupils to write in the place in the same columns and remember to carry where necessary.



1st lesson

1 Numbers up to 1000
Find out the number of • in the □.



① How many groups of 10 can you make? 47 groups
② How many groups of 100 can you make? 4 groups
③ How many • are there altogether? 473

2 Reading a clock time
What time is it?

①  3 o'clock
②  20 minutes past 8 8:20
③  15 minutes to 11 11:45
④  5:33

3 Let's find the answers using vertical form.

① 62 + 17 79 ② 34 + 55 89 ③ 5 + 73 78 ④ 44 + 28 72
⑤ 31 + 59 90 ⑥ 56 + 7 63 ⑦ 87 + 26 113 ⑧ 64 + 38 102
⑨ 200 + 500 700 ⑩ 800 + 200 1000 ⑪ 863 + 7 870 ⑫ 545 + 47 592

90

4 Calculating subtraction in vertical form
Let's find the answers using vertical form.

① 78 − 43 35 ② 80 − 68 12 ③ 63 − 56 7 ④ 23 − 9 14
⑤ 146 − 83 63 ⑥ 134 − 65 69 ⑦ 105 − 27 78 ⑧ 100 − 36 64
⑨ 900 − 300 600 ⑩ 1000 − 600 400 ⑪ 450 − 8 442 ⑫ 681 − 23 658

5 I am reading a book of 108 pages.
I finished reading 89 pages. How many pages are remaining for me to read?
108 - 89 = 19 Answer: 19 pages



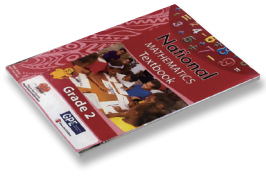
6 Let's measure the lengths of the lines.
How long are they in centimetres and millimetres?
And, how long are they in millimetres?

① 12 cm, 120 mm
② 7 cm 6 mm, 76 mm

7 What are the correct units of length for the following objects?

① The length of a classroom. m
② The thickness of a textbook. mm





1st lesson

91

Lesson Flow

P ⑤ Recognise that this is the scene of subtraction, and solve the problem using subtraction.

P ⑥ Measure lengths of the lines ① and ②, and write the lengths in simple concrete number and in compound number.

TN Teacher assesses whether pupils can accurately measure the lengths using rulers.

TN Pupils should describe each length in both simple concrete number and compound number. They should be able to demonstrate their understanding of the unit conversion in length.

⑦ Pupils select and use an appropriate unit of length according to an object.

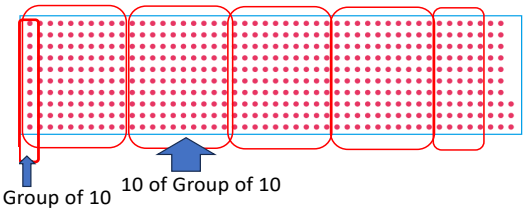
TN Teacher lets pupils estimate the length of an object and think of an appropriate unit of length to be used.

TN For various objects in pupils' surrounding environment, Teacher tells pupils to think of the unit of length which can be used for each of them.

Sample Blackboard Plan 1

Date: **Chapter 6** : Lengths **Topic : Review.** **Lesson** 1 of 2

1



① How many groups of 10 ? Answer: 47 groups
② How many group of 100 ? Answer: 4 groups
③ How many ・all together? Answer 473

2

①  3 o'clock

②  20 minutes past 8 / 3 o'clock

③  15 minutes to 11 / 11:45

④  5 o'clock 33 minutes / 5:33

3

① 62 + 17	② 34 + 55	③ 5 + 73	④ 44 + 28
62 + 17 = 79	34 + 55 = 99	5 + 73 = 78	44 + 28 = 72
⑤ 31 + 59	⑥ 56 + 7	⑦ 87 + 26	⑧ 64 + 38
31 + 59 = 90	56 + 7 = 63	87 + 26 = 113	64 + 38 = 102
⑨ 200 + 500	⑩ 800 + 200	⑪ 863 + 7	⑫ 545 + 47
200 + 500 = 700	800 + 200 = 1000	863 + 7 = 870	545 + 47 = 592

Sample Blackboard Plan 2

Date: **Chapter 6** : Lengths **Topic : Review.** **Lesson** 1 of 2

4

① 78 − 43	② 80 − 68	③ 63 − 56	④ 23 − 9
78 − 43 = 35	80 − 68 = 12	63 − 56 = 7	23 − 9 = 14
⑤ 146 − 83	⑥ 134 − 65	⑦ 105 − 27	⑧ 100 − 36
146 − 83 = 63	134 − 65 = 69	105 − 27 = 78	100 − 36 = 64
⑨ 900 − 300	⑩ 1000 − 600	⑪ 450 − 8	⑫ 681 − 23
900 − 300 = 600	1000 − 600 = 400	450 − 8 = 442	681 − 23 = 658

5

Book : Total 108 pages
I finished reading 89 pages.
How many pages are remaining?
Math expression
108 − 89 Answer: 19 pages

6

Measure the lengths of the lines.
① How long are they in cm and mm?
② How long are they in mm?

① Line 1: 12 cm Line 2: 7 cm 6 mm

② 1 cm = 10mm
Line 1: 12 cm = 12o mm
Line 2: 7 cm 6mm
70 mm + 6 mm. = 76 mm

7

What are the correct units of length?

① The length of a classroom
・ Guess: How long ..... 8 m
Answer unit : m

② The thickness of a textbook.
・ Your measurement : 6 mm
Answer: mm

Unit 6 Unit: Lengths

p.108: Sub-unit 1, L1

Teacher's Notes

Use of measuring units

The practice of using measuring units, a group activity can be used: pupils make groups, and each group discusses and decides on what measuring units they will use. Teacher tells them to identify lengths of objects by using the units they agreed for their own group. Through this activity, pupils come to realise that within a same group, as they are using the same measuring unit, they can compare the lengths; however, with other groups who are using different units, they cannot compare the lengths. Pupils should go through this activity and have a first-hand experience to gain this realisation.

p.109: Sub-unit 1, L1

Sample Blackboard Plan

Date: **Chapter 6** : Lengths **Sub-chapter 1:** How to Compare **Lesson** 1 of 2

Main Task: Let's think about ways to compare lengths.

Review

▷▷Let's play a game of rock-paper-scissors and stick the tapes together.

- Win with rock- get a tape A
- Win with scissors – get a tape B
- Win with paper – get a tape C

❖ Play the game in pairs 15 times.

Activities

- How can we compare the lengths of the tapes you have received?

Write down pupils' ideas how they can compare the lengths.

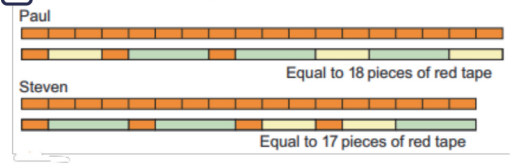
- Various ways used in comparing lengths.

a) By putting the ends together.

b) By cutting a piece of rope and placing along each tape to compare how many pieces each tape needs.

c) By placing pencils along each tape and finding out how many pencils are needed for each.

1 Is Steven's tape longer than Paul's?



Important Point

Length can be compared by using the same unit measure of length. You can show length by the number of that unit.

Summary

- Emphasise on the important point.

p.110: Sub-unit 1, L2

Teacher's Notes

Length is the term used for identifying the size of an object or distance from one point to the other. For example, the length of a ruler tells us how long the ruler is.

1. What Is Length?

Measurement of length can be defined as an act of identifying the length of objects in some standard or non-standard units. The skill to measure the length is very important in our everyday life.

2. Units to Measure Length

We can measure the length of an object by using different units like metre, centimetres, feet, inches or by using a handspan, foot-span, etc. We classify the units to measure length into two types:

(1) Non-standard units of measuring length

The non-standard units do not have any fixed measurement in numbers. The measurements vary from person to person and object to object.

For example, a kid and his father are measuring a painting using their hands. So, the length they will get will be different because the handspan of a kid is usually smaller than that of an adult. Some of the non-standard units of length are handspan, foot span, finger width, a thread or a rope, etc.

(2) Handspan

Handspan is the maximum distance between the tips of the thumb and the little finger. It is generally about 8 inches, but it depends on your hand.

(3) Foot-span

The foot-span is defined as the distance between the point of the toe and the heel of the foot.

3. Tools used for Measurement of Length

(1) Rulers

Rulers have straight edges and are stiff. One side of the ruler has markings in inches and the other side has markings in centimetres. Rulers are good to use for shorter lengths like the length of a pencil or notebook.

(2) Tape Measures

Tape measures are flexible straight edges with graduated markings. Since most tape measures only measure one unit system (U.S. customary or metric), you'll need to find one that uses the unit system you need. Since these tools can bend, they're good to use when measuring the total length of an object that exists in more than one dimension (e.g., waist measurements, the circumference of a wood block, etc.).

(3) Meter Sticks

Meter sticks and yardsticks are the same in construction and length. Both have straight edges and are stiff. Metre sticks measure all lengths up to 1 metre, and yardsticks measure all lengths up to 3 feet.

(4) Odometers

Odometres are tools that measure long lengths traveled by vehicles, like cars and bicycles. Pedometres measure long lengths traveled by a human or other living creature as it walks. These tools are good for measuring miles and kilometres, but they are calibrated by professionals and work without hands-on involvement from the user.

There are two sides of a ruler. On one side, we see centimetres/millimetres and on the other side, we see inches. The following steps are required to measure the length of an object:

Step 1: Choose the unit in which you want to measure the length of an object. If you want a value in cm/mm, then use the cm/mm side of the ruler. If you want the value in inches, then use the inches side of the ruler.

Step 2: Find 0 mark on one end of the ruler. Align the zero mark with the starting edge of the object to be measured.

Step 3: Look at the endpoint of the object and note the value. For example, in the below figure, the length of the pencil is from 0 to 10 cm.

4. Units of Measurements - intruments

centimetres - meter

kilometres - odometer

Unit 6 Unit: Lengths

p.116: Sub-unit 2, L3

Teacher's Notes

Introduction of mm

When measuring objects using "cm" as the unit of measurement, pupils will come across objects whose lengths are "a little more to ◯ cm" or "◯ cm and a half". In such situations, pupils should start to question "How can we accurately tell their exact lengths?"

As pupils explore how to overcome this question, they are expected to come up with various different ideas such as the following:

- We can put smaller marks.
- We can put marks right between the centimetres.
- We can put about 5 marks between the centimetres.
- We can put 10 marks between the centimeters.

In this way, pupils should be able to realize the usefulness of having "smaller marks" with which they can measure smaller lengths.

Closer look at a ruler

When we look at our rulers, we notice there are various signs and marks indicated. Teacher can draw pupils' attention to where the marks are placed as well as what kinds of signs are placed for 5 cm or 10 cm.

p.117: Sub-unit 2, L3

Sample Blackboard Plan

Date: **Chapter 6** : Lengths **Sub-chapter 2:** How to Represent Lengths **Lesson** 3 of 4

Main Task: **How can we measure lengths that are smaller than 1 cm?**

Review

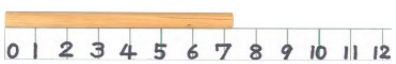


A B C

Which of the above A, B or C is the correct way to measure the length of the object? Explain.

Activities

[5] How long is this stick?



- 7 cm and a little more.
- It is somewhere between 7 cm and 8 cm.
- How long exactly is it?

- How can we measure lengths that are not in exact centimetres?

•We can measure them using a ruler with smaller scales.

•We place marks smaller than 1cm. We add marks right between the centimetres.

•We can divide 1cm into 10 and put marks.

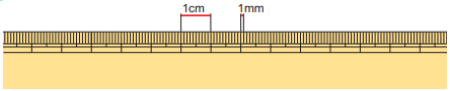
Important Point

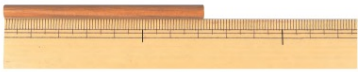
The length of 1cm equally divided into 10, is called 1**millimetre**, and is written as 1mm.



Millimetre (mm) is another unit of length.

1 cm = 10mm





The length of the stick is 7 cm 2mm. We can read this as "seven centimetres and two millimetres".

Summary

- Millimetre (mm) is another unit of measurement.
- In a ruler we can see that there are 10 mm in 1 cm

p.118: Sub-unit 2, L4

Teacher's Notes

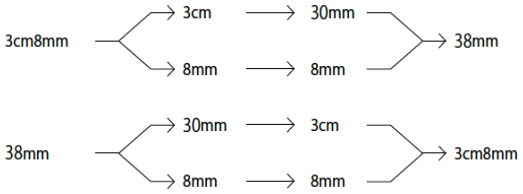
Converting the Units of Measurement

A unit conversion follows a rule below.

1 cm = 10 mm 2 cm = 20 mm 3 cm = 30 mm

During lessons, Teacher can reinforce this rule with pupils. It would be also effective to visualise a centimetre-scaled ruler and a millimetre-scaled ruler to have pupils compare the apparent difference in the numbers of marks appearing on both rulers.

Presenting a diagram as shown below would be also effective.



In the Exercise on page 80, the teacher explains clearly the intent of this part of the lesson so that all pupils will know what to do.

Pupils must practice measuring the lengths of various objects around themselves by using the unit's "cm" and "mm".

Demonstrate how the pupils could firstly place a ruler having its marked side up, put two dots for the specified length, i.e. 8 cm, and then connect these dots by drawing a line. When drawing a line, pupils should use the other side of the ruler that is not marked and assist them to practice until they master the use of a ruler.

Whatever form the activity takes, it is good that Teacher has pupils first estimate the lengths before measuring the actual lengths.

p.120: Sub-unit 3, L1

Teacher's Notes

As most of us know, the metre is a unit of length. Like the kilogram, it's part of the International System of Units (abbreviated as the "SI"). The metric system is another name that this goes by.

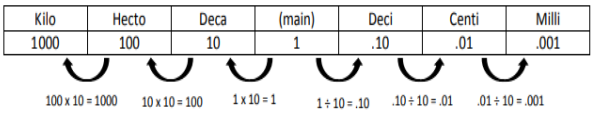
The foot is an alternative length unit. Used in the United States Customary system of measurement, it's decidedly less popular at the global level. But considering Uncle Sam's fondness for the foot, being able to convert feet into metres — and to do the reverse — is an important skill.

Unit Conversions

Metric vs. Imperial

There are two systems of measurement: metric and imperial. The metric system includes units such as grams, litres, millilitres, etc. The imperial system (which is mainly used in the U.S.) includes units such as pounds, ounces, gallons, pints, etc.). Recipes may be presented in either system, so it is important to know how to convert between the two.

The Metric System



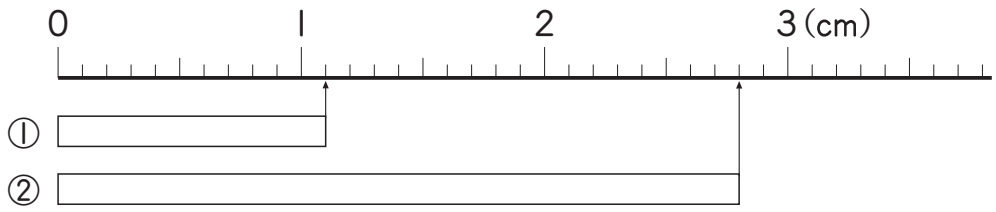
The metric system uses the same prefixes for all different units of measure.

Each prefix means there is an increase or a decrease by a factor of 10. Starting with the main unit of 1, we can multiply by 10 to get to deca. We can then multiply deca by 10 in order to get to hecto, which is 100. We can multiply hecto by 10 to get to kilo, which is 1000. Starting with the main unit of 1 again, we can divide by 10 to get to deci, which is .10. We can divide deci by 10 to get to centi, which is .01. We can then divide centi by 10 to get to milli, which is .001. The end of the word will change depending on what unit of measure we are referring to; distance, mass/weight, volume. The following tables show how metric units are converted to other metric units, by multiplying and dividing by factors of 10, as shown above.

End of Chapter Test: Chapter 6 **Date:**

Evaluation: Chapter 6 Lengths	Name:	Score /100

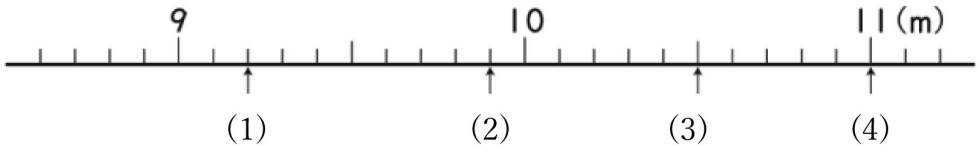
1. What are the lengths of the following lines? [10 points each for all correct answers]



① ____ cm ____mm or _____mm

② ____ cm ____mm or _____mm

2. Read the scale. [10 points each for all correct answers]



(1) ____m____cm (2) ____m____cm (3) ____m____cm (4) _____m

3. Calculate the length [10 points for each]

(1) 4 m 20 cm + 50 cm =

(2) 5 m 30 cm − 80 cm =

4. Make a math sentence and find the answer. [10 points for math sentence and 10 points for answer]

There is a string which is 10cm 3mm long. I used 7 cm. How many cm is left?

Math sentence _____ Answer _____

Chapter 7 Tables and Graphs

1. Unit Objectives

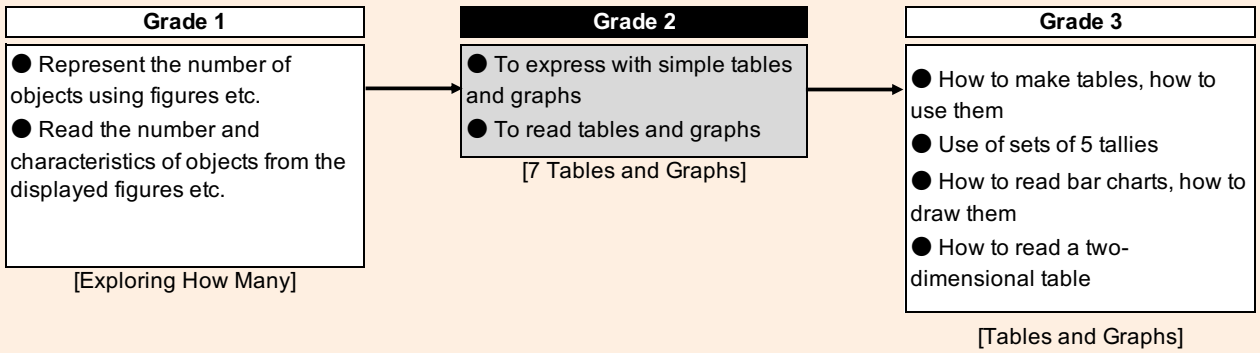
- To organise and classify numbers and quantities in a daily life, and represent them by using simple tables or graphs, and to interpret these presentations.

2. Teaching Overview

In this unit, while using themes and materials that pupils are interested in, they summarise them in the form of simple tables and graphs based on the viewpoint of expressing what they want to investigate in an easy-to-understand manner. In addition, pupils will be able to read from various point of views of the tables and graphs that they have created.
Through this process, it is important to let pupils experience the merits of representing things in tables and graphs, and to foster the attitude of trying to represent familiar things in tables and graphs.

Key Concepts: Reading tables and graphs.

3. Related Learning Contents



Unit 7

Unit: Tables and Graphs
Sub-unit: 1. Introduction of Tables and Graphs
Lesson 1 of 3

Textbook Page : p.92~94
Actual Lesson 062

Sub-unit Objective

- To understand ways to present numbers and quantities in daily life by using simple tables or graphs and to interpret these presentations.

Lesson Objective

- To research what kind of chores and how many pupils usually do at home and represent the result in a table after classifying the numbers of pupils by chore.

Prior Knowledge

- Exploring the most popular lunch students liked in a particular class based on a survey. (Gr 1 Chapter 9)
- Presenting the most popular food pupils liked as cards on the blackboard. (Gr 1 Chapter 9)

Preparation

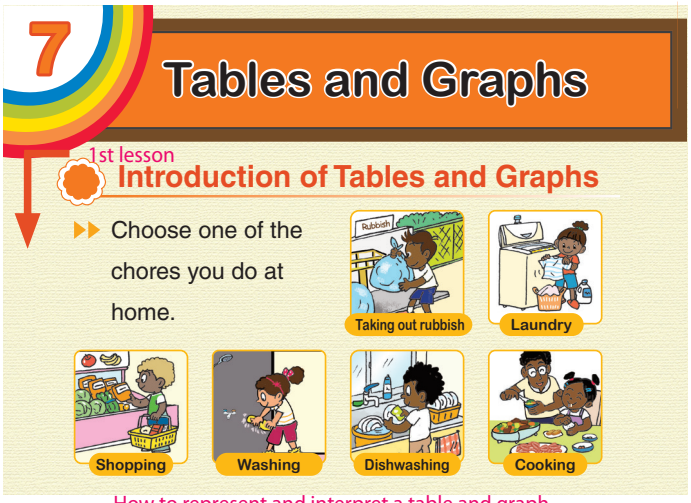
- Pictures of home chores, table to present the result of research.

Assessment

- Identify the kind of chores pupils do at home and represent the result in a table after classifying the numbers of pupils by chore. F S

Teacher's Notes

The purpose of the statistical analysis is NOT to draw out charts and graphs, but to clarify and understand the features of a specific group. Teacher should plan this activity with the aim of identifying specific features of the chores of Timo and his classmates. Pupils should discuss similar features for their own class. The teacher should follow the same approach used for Timo's class for the class to identify their own features to categorise.Then, following the introduction part of identifying the specific features of Timo's group, Teacher should go back to the topic of the features of pupils' class. This sequence of the lesson encourages pupils to find their own group's specific features.



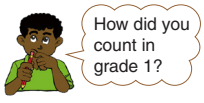
1 How to represent and interpret a table and graph

In Timo's class, everyone chose one chore and put their choices on the blackboard.

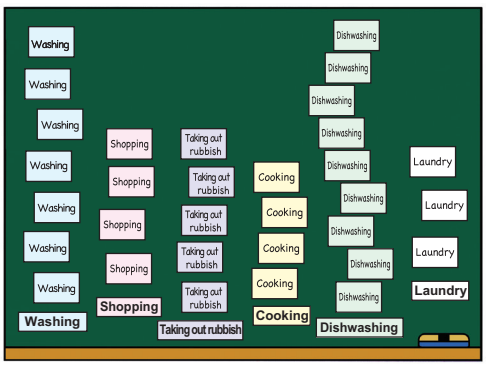


1 How can you count the number of children for each chore?

Group the same cards

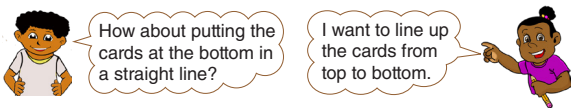


92 = □ + □



2 The cards were arranged as shown.

Discuss how to arrange the cards so you can see what chores everyone is doing.



3 Fill in the **table** with the number of children for each chore.

Choice of Chores

Chores	Washing	Shopping	Taking out rubbish	Cooking	Dishwashing	Laundry
Number of children	7	4	5	4	9	3

□ − □ = 93

INTRODUCTION

1 Review.

T/P Review key ideas from grade 1 chapter 9.

BODY

2 Discuss the features of their own class.

T How can you describe our class? What kind of features can we come up with to describe our class?

T What is the favourite sport/animal/fruit in our class?

P We have many friends who like sports/animals/fruits _____(based on head count)

TN Collect feedback and write on the board.

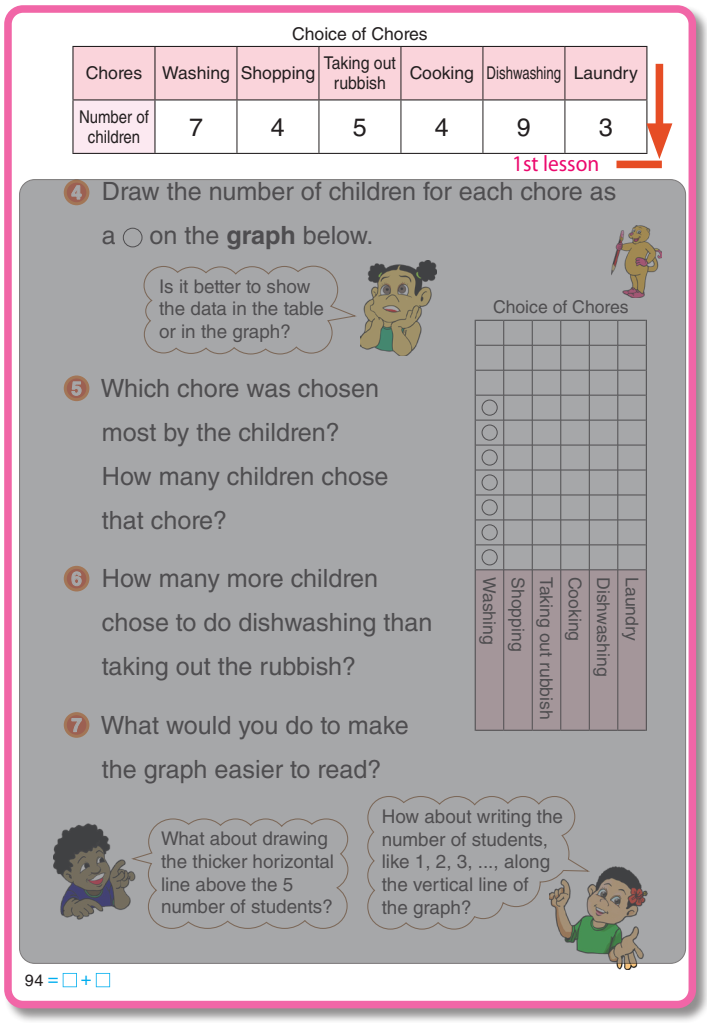
3 Introduce the main task.

T Introduce and explain the main task, "Let's find out what chores the children in Timo's class chose."

4 ❶ Discuss the result about the chores that children in Timo's class chose.

T Invite pupils to present what they notice about the result.

P Pupils' responses:



- There are many cards under dishwashing.
- There seem to be less cards for laundry.
- It is difficult to tell which chore is the most popular at first sight.

5 ❶ Think about how to avoid miscounting the number of cards under each chore.

T How do you avoid miscounting the cards? Do not miss any single card.

P I will put a check mark (tick) on the card we counted.

P When we were in grade 1, we collected the same kind of cards, and grouped them. So, we should collect the same cards for each chore, and place them on the blackboard.

TN Let pupils actually use (manipulate) the cards and arrange them for comparison.

6 ❷ Explain the best way of arranging the cards to find the difference in the number of children.

T How can we arrange the cards so that you can see the difference in the numbers of children?

P Line up the cards in a straight line.

P It seems easy to find the difference when we line up the cards starting from the bottom in a straight line.

7 ❸ Present the number of children by chores in a table.

T/P Count the number of cards for each chore and put the numbers in the table as in p.93

8 Discuss about the table.

T Lets present what you noticed about the table.

P Pupils' responses:

- 9 children do dishwashing at home and it is the most popular chore.
- Not many children do laundry and it is the least popular chore.
- The number of children who do shopping and cooking is the same.
- From the table, we can easily understand how many children chose which type of chore.

CONCLUSION

9 Summary.

T/P Summarise the lesson by confirming pupils' understanding of the main ideas in the lesson.

Due to space limitations, the Sample Blackboard Plan is placed on page 147.

Unit 7

Unit: Tables and Graphs
Sub-unit: 1. Introduction of Tables and Graphs
Lesson 2 of 3

Textbook Page : p.94
Actual Lesson 063

Lesson Objective

- To represent a simple graph based on the table showing the numbers of the children by chore.

Prior Knowledge

- Exploring the most popular lunch students liked in a particular class based on a survey. (Gr 1 Chapter 9)
- Presenting the most popular food pupils liked as cards on the blackboard. (Gr 1 Chapter 9)

Preparation

- Table showing the number of children by chore, graph.

Assessment

- Represent the numbers of the children by chore in a simple graph. F S

Teacher's Notes

Chart and graph

The graph using ◯ in this chapter is a graph that is somewhat the combination of a pictograph and a bar graph.

One of the advantages of charts is to classify numbers and show them directly, and graphs have the strengths in visually showing the size and order of the numbers.

This unit will form the foundation for understanding the charts and graphs, which will help pupils to realise the usefulness of using the charts and graphs.

Choice of Chores

Chores	Washing	Shopping	Taking out rubbish	Cooking	Dishwashing	Laundry
Number of children	7	4	5	4	9	3

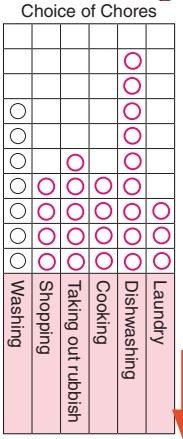
2nd lesson

4 Draw the number of children for each chore as a ◯ on the **graph** below.





Choice of Chores



5 Which chore was chosen most by the children? How many children chose that chore? Dishwashing 9 children

6 How many more children chose to do dishwashing than taking out the rubbish? 4 children

7 What would you do to make the graph easier to read?

2nd lesson



What about drawing the thicker horizontal line above the 5 number of students?

How about writing the number of students, like 1, 2, 3, ..., along the vertical line of the graph?



94 = □ + □

Lesson Flow

INTRODUCTION

1 Review.

T/P Review key ideas from previous lesson.

BODY

2 Introduce the main task.

T Introduce and explain the main task, 'Let's make a graph that is easier to read'.

3 Discuss the best way to present the result.

T "How can we present the result so that we can easily find the difference in the number of children who chose the respective chores?"

T/P Discuss the best way to present.

TN Explains the picture showing the numbers by using ◯, like the one on p.94, is a graph.

4 ④ Make a graph based on the table above.

T Let's draw ◯ for the number of children in each chore.

P Draw ◯ for the number of children in each chore

TN Guide pupils to draw ◯ for the number of children. Explain that instead of numbers, we will use ◯, to represent the numbers.

TN Guide pupils to compare the number of ◯ in each chore and understand the features of the respective chores such as the highest number of ◯ or least number.

5 ⑤ ⑥ Think about the features of each chore from the graph.

T Ask pupils to write down what they noticed about the graph in their exercise books and answer ⑤ and ⑥.

TN Guide and assist pupils to use phrases such as 'same as', 'the most popular' the 2nd popular, 'the least popular' etc. as features of each respective chore when writing down their notes.

6 Present what you noticed about the graph.

T Let's present what you noticed about the graph.

P Pupils' expected responses;

- There are 9 children who do dishwashing at home and is the most popular.
- The difference in the number of ◯ between dishwashing and taking out rubbish is 4 children
- Shopping and cooking have the same heights.
- We can easily compare the number of children by chore in the graph.

CONCLUSION

7 Summary.

T/P Summarise the lesson by confirming pupils' understanding of the main ideas in the lesson.

Sample Blackboard Plan

Date: **Chapter 7**: Tables and Graphs **Sub-chapter 1:** Introduction of Tables and Graphs **Lesson** 2 of 3

Main Task: Let's make a graph that is easier to read.

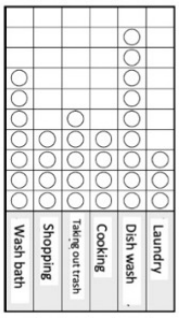
Review

Choice of Chores

Chores	Washing	Shopping	Taking out rubbish	Cooking	Dishwashing	Laundry
Number of children	7	4	5	4	9	3

Activities

④



⑤

- The most popular is Dish washing (9 children).
- 2nd popular is washing (7 children)
- 3rd popular is Taking out rubbish (5 children).
- 4th popular is shopping (4 children) and cooking (4 children).
- The least popular is Laundry (3 friends)

When we made a graph, it is easy to understand the difference in the numbers of friends.

⑥

- The difference between dish washing and taking out rubbish is 4 children.

Summary

- We make graph to read the findings easily.

Unit 7

Unit: Tables and Graphs
Sub-unit: 1. Introduction of Tables and Graphs
Lesson 3 of 3

Textbook Page : p.94
Actual Lesson 064

Lesson Objective

- To think of ways to make a graph easier to read

Prior Knowledge

- Exploring the most popular lunch students liked in a particular class based on a survey.
- Presenting the most popular food pupils liked as cards on the blackboard. (Gr 1 Chapter 9)

Preparation

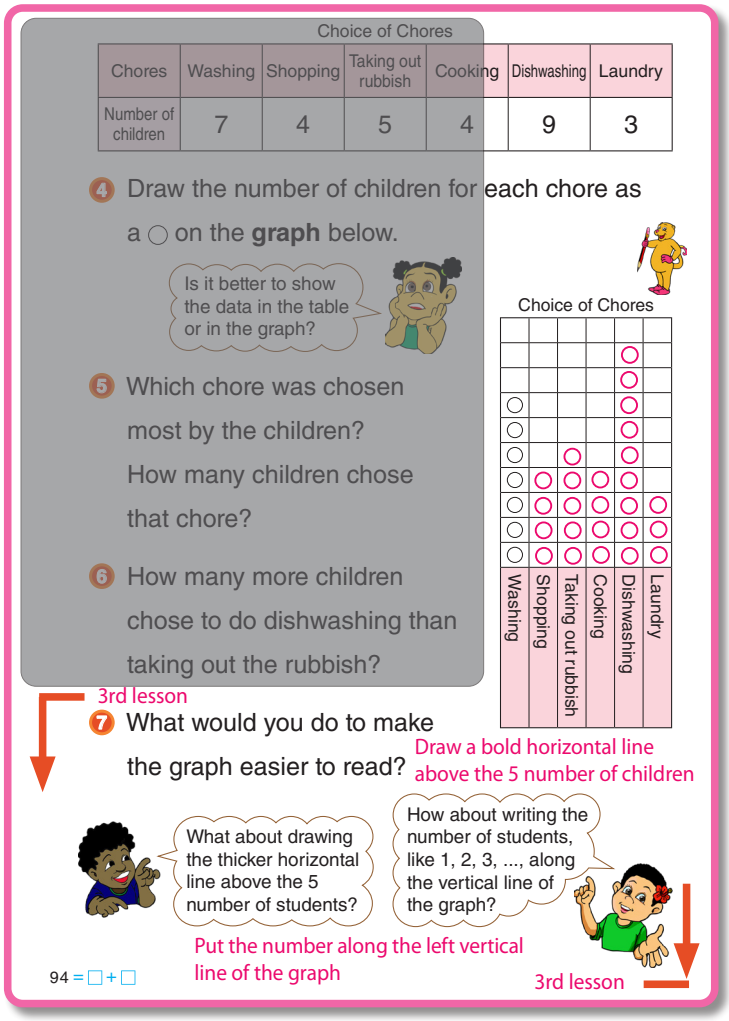
- The table showing the numbers of children by chore, graph, enlarged pictures from the textbook, digital textbook software (if available).

Assessment

- Draw a readable graph for various data correctly. F S

Teacher's Notes

A graph consists of a series of vertical and horizontal lines representing data
To read a graph, students need to consider the representation of data according to the bars against the vertical or horizontal lines and interpret the scale axis.



Lesson Flow

INTRODUCTION

1 Review.

T/P Review key ideas from previous lesson.

P Discuss the following questions:

- Which chore had the least number of children?
- Which chore had the highest number of children?
- Which chores had the same number of children?

BODY

2 Introduce the main task.

T Introduce and explain the main task, 'Let's find out the features of charts and graphs'.

3 7 Let's discuss how to make the graph easier to read.

T Ask the pupils "How can we make the graph easier to read?"

P How about drawing a bold horizontal line above the number of 5 children?

P Why don't we write the number of children like 1, 2, 3… along the vertical line of the graph?

4 The features of charts and graphs.

T Let's find out the features of charts and graphs and write down in your exercise book.

TN Allow time for them to discuss as a whole class.

Lesson Flow

T What are some features of charts and graphs?
P The chart shows the number directly.
So, we can easily understand the number
P The graph shows the difference in numbers.
So, we can compare easily.

5 Summary.

T/P Summarise the lesson by confirming pupils' understanding of the main ideas in the lesson.
TN Allow time for them to discuss as whole class.

T What are some features of charts and graphs?
P The chart shows the number directly.
So, we can easily understand the number
P The graph shows the difference in numbers. So, we can compare easily.

6 Summary.

T/P Summarise the lesson by confirming pupils' understanding of the main ideas in the lesson.

p.143

Sample Blackboard Plan

Date: **Chapter 7**: Tables and Graphs **Sub-chapter 1:** Introduction of Tables and Graphs **Lesson** 1 of 3

Main Task: Let's find out what chores the children in Timo's class chose.

Review





Activities

1 In Timo's class everyone chose one chore and put the choice on the blackboard



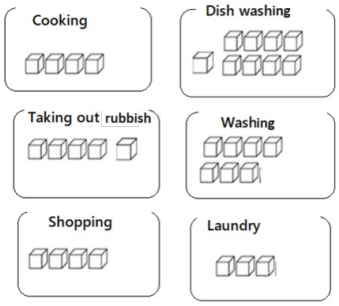
1 How could you count the number of children of each chore?

Guess

- *Many of them do dishwashing*
- *Not many do laundry*

Let's arrange the cards in groups

Findings



2



3 Fill in the **table** with the number of children for each chore.

Choice of Chores

Chores	Washing	Shopping	Taking out rubbish	Cooking	Dishwashing	Laundry
Number of children	7	4	5	4	9	3

Summary

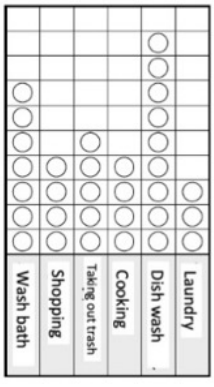
- We can count the number more easily when we put the same picture cards together.
- We can easily know how many children choose which chore when we table them.

Sample Blackboard Plan

Date: **Chapter 7**: Tables and Graphs **Sub-chapter 1:** Introduction of Tables and Graphs **Lesson** 3 of 3

Main Task: Let's find out the features of charts and graphs.

Review



Activities

7

Choice of Chores

Chores	Washing	Shopping	Taking out rubbish	Cooking	Dishwashing	Laundry
Number of children	7	4	5	4	9	3

To make graph easier to read;

- ***Draw a thick line at every 5 people.***
- ***Write the number of children vertically in the graph.***
- ***PUT UP PUPILS' WORK***

Summary

- You can see the number quickly in the table.
- You can easily see the difference using the graph.

Unit 7

Unit: Tables and Graphs
Problems 1 and 2
Lesson 1 of 1

Textbook Page : p.95~96
Actual Lesson 065

Lesson Objectives

- To review what have been learnt.
- To think of ways to make a graph easier to read and compare the graph with another graph.

Prior Knowledge

- All contents covered in this unit. (unit 7)

Preparation

- Enlarged copy of January weather chart, blank copy of weather chart.

Assessment

- Complete Problem 1 and Problem 2 correctly. S

Teacher's Notes

This unit will foster the positive attitude and creative thinking to simplify things and clearly represent the things through the activities of classifying some data for a particular purpose and arranging the data in a chart and a graph. In order for pupils to acquire such attitude or creative ways of thinking, it is necessary to have pupils well experience the data collection, arrangement, analysis, and representation.
Teacher should prepare some research topics from the pupils' daily lives such as the research on blood types, birthdays and favorite foods of their friends. It is important that these topics are the ones that pupils are familiar with and easily get interested in.

Problems 1

1st lesson

① Kevau did a research on the weather in January in his town. How to represent and interpret a table and graph

The Weather in January

1	2	3	4	5	6	7	8	9	10	11
Windy	Sunny	Sunny	Sunny	Cloudy	Sunny	Sunny	Cloudy	Rainy	Sunny	Sunny
12	13	14	15	16	17	18	19	20	21	22
Windy	Sunny	Cloudy	Sunny	Cloudy	Sunny	Windy	Sunny	Sunny	Sunny	Windy
23	24	25	26	27	28	29	30	31		
Cloudy	Windy	Windy	Sunny	Sunny	Sunny	Cloudy	Sunny	Sunny		

① Write the number of days for each weather condition in the table below.

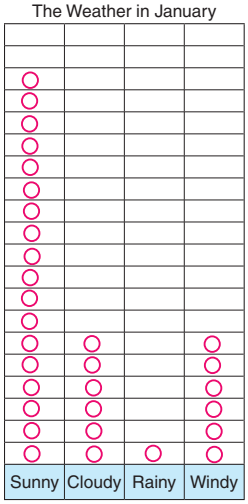
The Weather in January

Sunny	Cloudy	Rainy	Windy
18 days	6 days	1 day	6 days

② Use the graph on the right to represent the number of days using ○.

③ Were there more sunny days or cloudy days? What was the difference?
Sunny days are more than 12 days.

The Weather in January



95

Problems 2

① Nancy recorded the weather for the month of January in her town. Interpret the graph

① What could you do to make the chart easier to read? Let's consider how to represent the data in the graph.

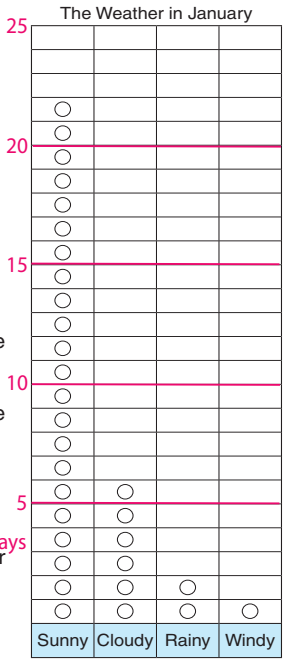
② Compare with the graph on page 95 and answer the questions.

(1) What type of weather had the same number of days?
Cloudy

(2) What type of weather had the biggest difference between the two graphs? What did you find out? Write it down.
Windy 5 days

(3) Write down your ideas in your exercise book, and discuss it with your friends.
There are more sunny days.
The graph shows the decreasing order from left to right.

The Weather in January



96

1st lesson

Lesson Flow

PROBLEMS 1

① Count the number of same weather and make a chart using the counted number.

T/P Read and understand the research about the weather in January.

T/P ① Put the number of days for Sunny, Cloudy, Rain, Windy in the chart on p.95.

TN In order to avoid miscounting, teacher guides pupils to use check marks (tick marks) on the days that pupils already counted or confirm that the sum of the number of days is 31.

② Complete the graph using ◯ to represent number of days (p.95).

T/P Guide pupils to draw ◯ for the number of days for each weather type, Sunny, Cloudy, Rain and Windy in p.95. of the textbook based on the information in the weather chart.

TN Let pupils confirm that the numbers in the chart and the numbers of ◯ in the graph are same.

P Complete ② and read the graph.

③ Think of other information that is presented on chart and graph.

P Think of other things they may have also noticed from their chart and graph and answer ③.

TN Guide pupils to write down what else they may have noticed from their chart and graph.

PROBLEMS 2

① Making the graph easier to read.

T ① How can you make it easier to read the number of ◯?

TN Encourage pupils to recall what they learnt in the previous lessons such as the features of a graph, the horizontal and vertical lines.
Consider what to write on both lines vertical and horizontal.

P Draw a bold horizontal line above the four (4) weather conditions

① ② ③ Identify the features of the graph by comparing with other graphs.

T Let's find out the features of the charts and graphs, and write them down in our exercise books.

P ② Identify the features of the graph by comparing with another graph.

P ③ Write down the features and whatever else they noticed about the graph in their notebooks.

Sample Blackboard Plan

Date: **Chapter 7**: Tables and Graphs **PROBLEMS** **Lesson** 1 of 1

Problems 1

① The Weather in January

1	2	3	4	5	6	7	8	9	10	11
Windy	Sunny	Sunny	Sunny	Cloudy	Sunny	Sunny	Cloudy	Rainy	Sunny	Sunny
12	13	14	15	16	17	18	19	20	21	22
Windy	Sunny	Cloudy	Sunny	Cloudy	Sunny	Windy	Sunny	Sunny	Sunny	Windy
23	24	25	26	27	28	29	30	31		
Cloudy	Windy	Windy	Sunny	Sunny	Sunny	Cloudy	Sunny	Sunny		

① No of Days for each weather conditio

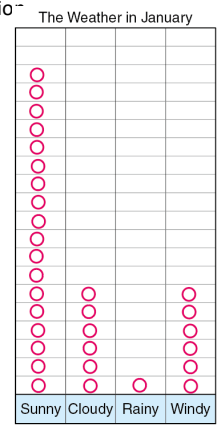
The Weather in January

Sunny	Cloudy	Rainy	Windy
18 days	6 days	1 day	6 days

② Use the graph on the right to represent the number of days using ◯.

③ Were there more sunny days or cloudy days? What was the difference?
Sunny days are more than 12 days.

The Weather in January



Problems 2

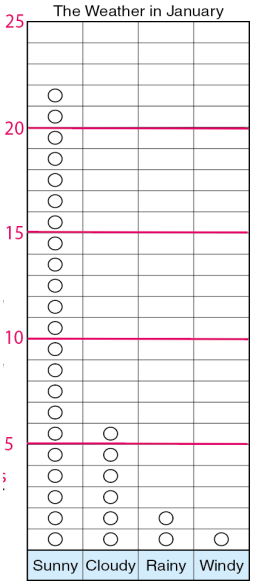
①

(1) What type of weather had the same number of days?
Cloudy

(2) What type of weather had the biggest difference between the two graphs? What did you find out? Write it down.
Windy 5 days

(3) Write down your ideas in your exercise book, and discuss it with your friends.
There are more sunny days.
The graph shows the decreasing order from left to right.

The Weather in January



Unit 7

Unit: Tables and Graphs
Have you ever seen it?
Lesson 1 of 1

Textbook Page : p.97
Actual Lesson 066

Lesson Objective

- Understand that the given situations are making comparison of which contains more.

Prior Knowledge

- Grade 1 Chapter 13: Let's compare amount of water.

Preparation

- Enlarged copy of p.97.

Assessment

- Compare which container contains more and explain. S

Teacher's Notes

Before comparing the actual amount, it is important to have pupils guess the result of the comparison. This exercise is to encourage the attitude towards finding out the answer to what cannot merely be measured by sight.



Lesson Flow

INTRODUCTION

1 Review.

T/P Review key ideas from Grade 1 Chapter: Let's compare amount of water.

BODY

2 Introduce the main task.

T Introduce and explain the main task, 'Let's look at the picture and find which can contain more.'

3 Which one have you seen among the pictures?

T/P Look at the picture and discuss the picture in the textbook.

T Let's name some of the objects you have seen from the picture.

P Expected responses:

- We can find 1 L and 2 L on plastic bottles.
- have seen the representation on the juice bottle.
- have never seen 5 dL.

4 Which one contains more?

T/P Read the sentence in the speech bubble by the girl?

T "Which one can contain more?"

P Expected responses;

- The tank contains plenty of water.
- 2 L is more than 1 L.
- It looks that 1000 mL is more than 1 L.
- I wonder how much 5 dL is.

T Let pupils know that in the next chapter they will learn more about what is discussed now.

CONCLUSION

5 Summary.

T/P Summarise the lesson by confirming pupils' understanding of the main ideas in the lesson

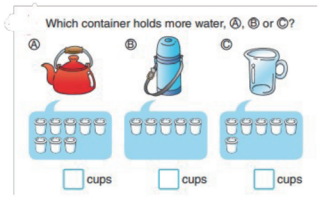
Sample Blackboard Plan

Date: **Chapter 7**: Tables and Graphs **Have you ever seen it?** **Lesson** 1 of 1

Main Task: Let's look at the picture and find which can contain more.

Review

Grade 1 Chapter 13



Activities

1. Which one have you seen among these pictures?



Write pupils' responses here.

2. Which one contains more?



Write pupils' responses here.

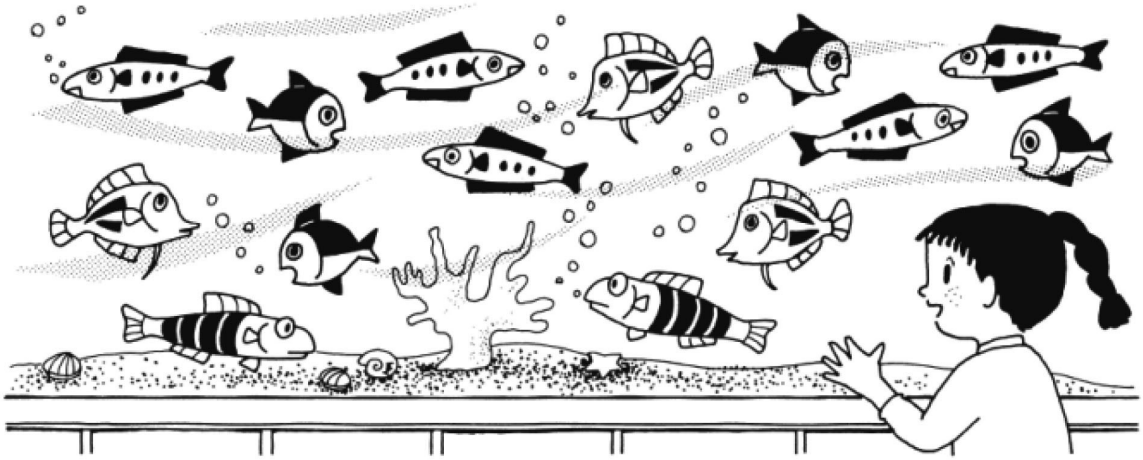
Summary

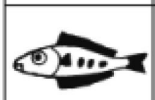
- The tank contains more than the others.
- 2 L is more Than 1 L.

End of Chapter Test: Chapter 7 **Date:**

Evaluation: Chapter 7 Tables and Graphs	Name:	Score /100

1. Answer the following questions.



(1) Represent the number of each fish by using ✓ in the box.

[10 points for each fish]

[20 points for each question]

(2) How many  are there?

_____

(3) How many  are there?

_____

(4) How many more  are there than  ?

_____

Chapter 8 Amount of Water

1. Unit Objectives

- To understand the meaning of units and measurements of volume, and to measure the volume
- To know the units of volume (millitre “mL” decilitre “dL” and litre “L”).

2. Teaching Overview

In this unit, we introduce the universal unit of volume (L, dL, mL). Then, pupils will be able to measure using universal units of volume and find the sum and difference of volumes by calculation. So far, in grades 1 and 2, pupils have learned about direct comparison, indirect comparison, and measurement of lengths using arbitrary units and universal units. As for area and volume, in grade 1, pupils have learned direct comparison, indirect comparison, and comparison using arbitrary units.

Comparing the Amounts of Water: Through concrete operations, the aim is to think about how to compare volumes and to be aware of the necessity of universal units.

How to Measure the Amounts of Water: Introduce “L” as a universal unit for measuring volume.

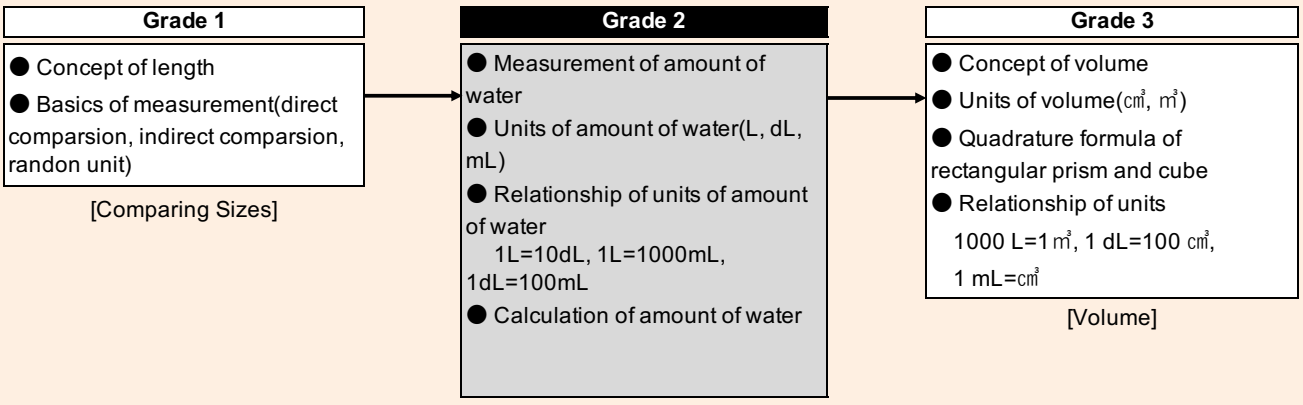
Smaller Measuring Cups: Think about how to measure the volume that cannot be measured with a 1 L measuring cup, and introduce a small unit of volume, dL.
Pupils understand the relationship between dL and L.

Finding Amount: Help pupils understand that the volume of water can be added and subtracted, and that it is sufficient to calculate the same places.

Very Small Amount of Water: “mL” is introduced as a unit that expresses the volume below a 1 deciliter measuring cup. Then, pupils understand the relationship between the units of volume: mL, dL, and L.

Key Concepts: Volume, units of volume, mL, dL, L.

3. Related Learning Contents



Unit 8

Unit: Amount of Water
Sub-unit: 1. Comparing the Amounts of Water
Lesson 1 of 1

Textbook Page : p.98
Actual Lesson 067

Sub-unit Objectives

- To understand ways to compare amounts and quantify amounts by using a measurement unit
- To understand the usefulness of quantifying an amount.

Lesson Objective

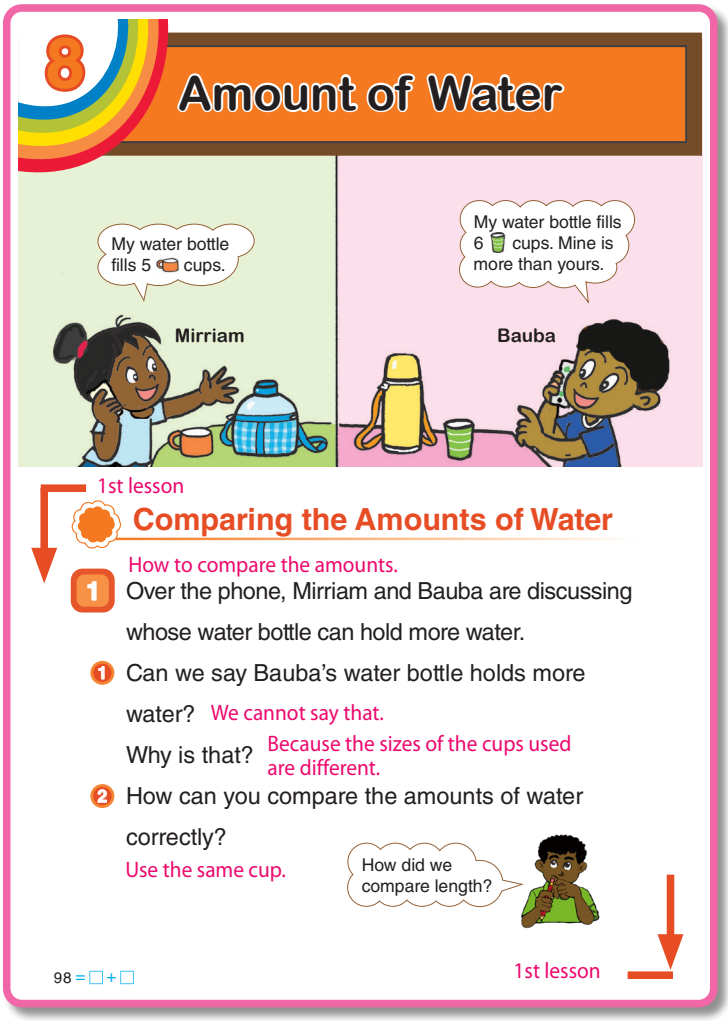
- To think of ways to compare amounts through manipulative activities with concrete objects and realise the necessity of a certain unit.

Prior Knowledge

- Comparing sizes, lengths, amount of water. (Grade 1, Unit 13)

Preparation

- 2 different shapes bottle (refer to the picture p.98), Big and small cups



Assessment

- Compare amounts of different containers using. F S

Teacher's Notes

Teaching Tips: Measuring the amount

1 Begin with estimation before comparing the actual amount. It is important to have pupils guess the result of the comparison.
This exercise is to encourage the attitude towards finding out the answer to what cannot merely be measured by sight.

2 Steps of teaching "Measurement"
Generally, the following four steps are considered in teaching the concept on measurements.
1) Direct comparison 2) Indirect comparison
3) Comparison using given (arbitrary) measurement units 4) Comparison using universal units
In step 3), the comparison using arbitrary measuring units, the exercise begins with using a specific unit (in this case a small container) to compare the amount of two different objects.
Through the exercise, pupils are expected to realise the necessity of using a measuring unit that anybody can use anywhere.
This understanding leads to the next teaching step of using the universal unit "L" (Litre).

1 L measuring cup

Through the demonstration of pouring 1 L of water filling a 1 L cubic measure into a 1 L cylinder, pupils come to understand that whatever the shape the 1 L measuring cup is, the 1 L measuring cups all contain the same amount of water.

Lesson Flow

INTRODUCTION

1 Review

T/P Review the key ideas from the previous lesson

BODY

2 Introduce the main task

T Introduce and explain the main task, "Let's think of how to compare the amounts of water accurately".

3 ① Comparing whose water bottle can hold more water.

T/P Let the students read and examine the situation of comparing whether Bauba's bottle holds more water and state their reasons.

T/P Show the two different shapes of bottles to students (fat bottle-Mirriam, long bottle-Bauba)

T/P ① Can we say Bauba's water bottle holds more water? Let's think of the reasons as to why.

P Expected responses;

- Bauba's water bottle holds more because the water fills 6 cups.
- Mirriam's water bottle holds 5 cups of water to fill the bottle.
- We cannot compare the amounts of water because the sizes of the two cups that Mirriam and Bauba used are different.

TN Explain to the students that we cannot simply compare the number of cups because the size of the cup that Mirriam used is different from the cup that Bauba used.

4 ② Let's think of how to compare amounts of water accurately.

T/P How can we compare the amounts of water accurately?

P Compare the amounts using the same cup.

P Compare by their heights when we pour the water into similar containers.

P By counting how many cups to fill each.

TN Remind pupils of how they compared lengths and apply the same to the comparison of amounts of water.
E.g. Place the water bottle on a flat surface and measure the height of the water

- Compare the weight when you hold it.
- Put in bottles of the same size and compare.
- Put in a same size smaller cup and compare by the number of cups it can fill.

T Ask students to do the above activities to find out for themselves.

P Find out the result and present the results to their friends.

CONCLUSION

5 Summary.

T/P Summarise the lesson by confirming pupils' understanding of the main ideas in the lesson.

Sample Blackboard Plan

Date: **Chapter 8**: Amount of Water **Sub-chapter 1:** Comparing the Amount of Water **Lesson** 1 of 1

Main Task: Let's think of how to compare the amounts of water accurately.

Review

Look at the quantity of water in containers around them or in page 97.

Activity

1 Mirriam's or Bauba's water bottle can hold more water?

① Can we say Bauba's water bottle holds more water?

Guess

- Mirriam's water bottle can hold more water because the bottle is larger in width
- Bauba's water bottle can hold more water because the bottle is taller.

② Ways to compare

- Compare in height when we put them.
- Compare in weight when we hold them.
- Compare the height of water when we pour the water into the same containers.
- How many cups the water fills.

How to compare

- Place it on a flat surface and measure the height of the water.
- Weigh by the weight when you hold it.
- Pour in bottle of the same size and compare.
- Pour Mirriam's and Bauba's water bottle into the cups of the same size respectively.
- Compare the number of cups filled with water.

Summary

- We can compare the amount of water in the container of the same size.
- We can compare by knowing how many cups the water fills.

Unit 8: Unit: Amount of Water

Sub-unit: 2. How to Measure the Amount of Water

Lesson 1 of 1

Textbook Page : p.99
Actual Lesson 068

Sub-unit Objectives

- To be able to measure the amount with 1 L measuring cup.
- To compare the quantified amounts by using the universal unit L.

Lesson Objectives

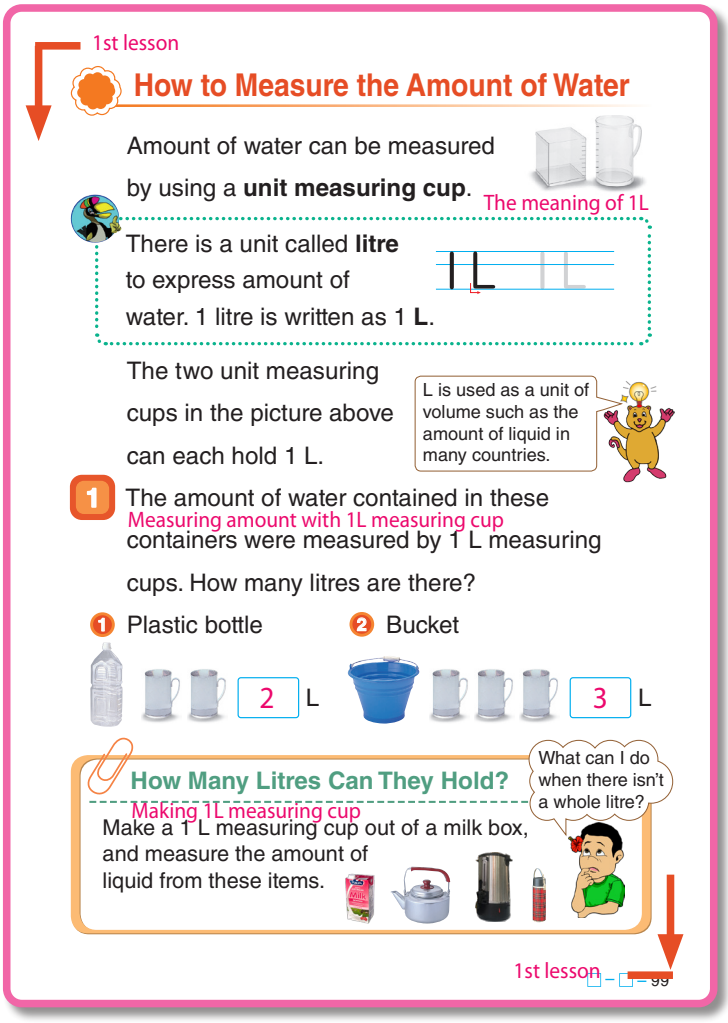
- To measure various amounts of water with 1 L measuring cup and 1 dL measuring cup.
- To understand litre as the unit used to express an amount of water and is written as (L)

Prior Knowledge

- Comparing sizes in lengths, amount of water, area. (Grade 1 Unit 13)

Preparation

- Bottles, large containers such as buckets, kettles, cooking pots, 1 L measuring cup, paints (coloring).



Assessment

- Measure various amount of different liquids with a 1 L measuring cup and arrange them from the smallest to largest. F S

Teacher's Notes

Ways to measure the amount of water
There are two ways to measure a container.
(1) Prepare a container filled with water and count the number of scoops made with a 1 L measuring cup to empty the container.
(2) Prepare an empty container and count the number of times a 1 L measuring cup is filled to fill up the container.

From the viewpoint of measuring the amount, point (1) way of measuring should be used. Until pupils become familiar with this type of manipulation activity, and until they become capable of accurately measuring an amount, many 1 L measuring cups should be prepared so that pupils count the number of the 1 L measuring cups used.

Lesson Flow

INTRODUCTION

1 Review.

T/P Review key ideas from the previous lesson.

BODY

2 Introduce the main task.

T Introduce and explain the main task, "Let's think of how to measure the amount of water".

3 Introduce the important point.

T/P Read and understand the important point .

T Explain to pupils so they understand the 1 L measuring cup, the amount of 1 L and how to write 1 L.

TN The "Unit measuring cup" is a general term for containers to measure amount. There are several shapes of "unit measuring cup" such as cubic shape and cylinder shape.

T Demonstrate to pupils how to write L correctly.

P Practice writing letter L.

TN Encourage pupils to acquire and make sense of the measuring unit (Litre) through the activity of making 1 L measuring cup. Explain that (L) is the unit to express amount of water and 1 litre can be written as 1 L.

4 1 Measure the amounts of water in the plastic bottle and bucket.

T/P Have pupils to measure the amount of water in the plastic bottle and bucket with the 1 L measuring cups. How many litres would each container hold?

P 1 Plastic bottle would hold 2 L.

P 2 The bucket would hold 3 L.

TN It is important that pupils actually compare the amounts of water using a 1 L measuring cup as an introduction of volume measurement.

5 Measure the amounts of water contained in various types of containers using 1 L measuring cup.

T Guide pupils to think of how to read the amount that is less or more than a whole litre.

TN When there is not a whole litre of water, advise the pupils to express it as "additional amount", such as "1 L and a little", "1 L and a half", "1 L and more than a half".

TN Teacher should carefully use the expression "a little less than 1 L" since the expression is a little difficult for pupils to understand.

CONCLUSION

6 Summary.

T/P Summarise the lesson by confirming pupils' understanding of the main ideas in the lesson.

Sample Blackboard Plan

Date: **Chapter 8**: Amount of Water **Sub-chapter 2:** How to measure the Amount of Water **Lesson** 1 of 1

Main Task: Let's think of how to measure the amount of water.

Review

- We can compare the amount of water in the container of the same size.
- We can compare by knowing how many cups the water fills.

Activity

How can we measure the amount of water?

Guess

- We need to decide a measuring unit.
- Use a container that anybody knows.
- Use the container of the same size.

There is a unit called **Litre** to express amount of water.

1 litre is written as



1 1 Plastic bottle can hold 2 L.

2 Bucket can hold 3 L.

Let's think of how to call the amount less than a whole litre.

Summary

- 1 L measuring cup is used to measure the amount
- Count how many 1 L measuring cups are filled with the water
- We can call the amount less than a whole litre "a little" or "half", etc..

Unit 8: Unit: Amount of Water

Sub-unit: 3. Smaller Measuring Cups

Lesson 1 of 2

Textbook Page : p.100
Actual Lesson 069

Sub-unit Objectives

- To think of ways to measure the portion that is less than 1 L and that cannot be measured with 1 L measuring cup.
- To know the unit dL and the relation of 1 L = 10 dL, and to understand the simple unit conversion between dL and L

Lesson Objectives

- To think of ways to measure the portion that is less than 1 L and that cannot be measured with 1 L measuring cup.
- To know that the unit dL is less than 1 L and how to write dL.
- To understand the relationship between 1 L and 10 dL

Prior Knowledge

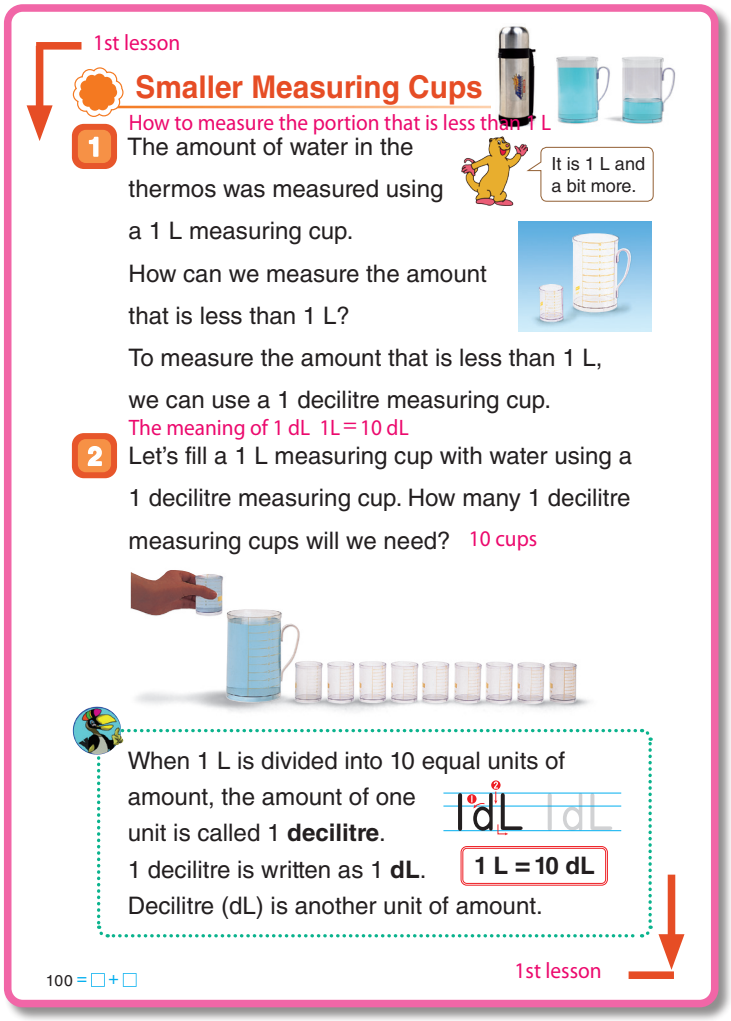
- Let's compare Amount of water Lesson # 4 (Grade 1 unit 13).
- Chapter 6 Length

Preparation

- Bottles, 1 L measuring cup, 1 dL measuring cup, paint (coloring)

Assessment

- Demonstrate ways of how to measure portions less than 1 L in real life situations. F S



Teacher's Notes

1 dL measuring cup

The unit dL, unlike L and mL, is a unit that is rarely used in pupils' daily life and they are not familiar with the term. Thus, it is important to take enough time for pupils to understand and to grasp a sense of the amount of 1 dL through manipulative activities

Teaching Tips: Volume and unit (metre)

	Kilo	Hector	Deca		Deci	Centi	mili
	1000	100	10	1	1/10	1/100	1/1000
Length	Km			m		cm	mm
Volume	kL			L	dL		mL
Weight	kg			g			mg
Area		ha		a			

The unit cL (centi-liter) is not common in PNG while it is used more often in Europe or other countries, particularly for liquor. 100 cL equals 1 L.

Lesson Flow

INTRODUCTION

1 Review.

T/P Review key ideas from the previous lesson.

T How can we measure more or less of a whole Litre?

TN Let pupils discuss ways to express the portion of water that is less than 1 L and that cannot be measured with 1 L measuring cup. Utilize creative opinions expressed freely by the pupils and facilitate the discussion.

T/P Discuss some ideas from the given situation.

P We can say 'a little' or 'half'

P Can 1 L be divided into 10 equally?

BODY

2 Introduce the main task.

T Introduce and explain the main task, "How can we measure the portion that is less than 1 L?".

3 1 Think of ways to accurately measure the portion that is less than 1 L.

TN Let pupils recall the measurement of length. When expressing the length that is less than 1 cm, pupils used the unit 1 mm that is the length of 1 cm equally divided into 10.

TN Based on such experience of measurement lengths, advise pupils to think of the unit 1 L equally divided into 10.

T Show 10 equal parts of a 1 Litre container using a measuring jar. Ask "How can we measure a portion less than 1 L?"

P We can use a smaller unit measuring cup than the 1 L measuring cup.

4 2 Understanding the unit dL and its relation.

TN Allow pupils to confirm 1 L = 10 dL through the manipulation activity using objects.

TN using the 1 L measuring container pour one part (1/10 of 1 L) into a transparent cup

T/P Let students find out the number of 1 decilitre measuring cup is needed to fill 10 measuring cups.

P We need 10 cups

TN Advise pupils to change the units depending on the amount in the similar way to the measurement of length as 10 parts is equal to 1 L

5 Important point

T/P Read and understand

T/P Demonstrate the correct way of writing dL, and let pupils practice writing dL in their exercise books.

CONCLUSION

6 Summary.

T/P Summarise the lesson by confirming pupils' understanding of the main ideas in the lesson.

Sample Blackboard Plan

Date: **Chapter 8**: Amount of Water **Sub-chapter 3:** Smaller measuring cups **Lesson** 1 of 1

Main Task: How can we measure the portion that is less than 1 L?.

Review

- 1 L measuring cup is used to measure the amount
- Count how many 1 L measuring cups are filled with the water

Activity

1 Think of ways to measure the amount of water less than 1 L?

Guess

- We can say "a little" or "half".
- Equally pour into same measuring cups less than 1L?
- We can use decilitre measuring cups.

2 How can we accurately measure the portion that is less than 1 L?
We can use smaller measuring cup than 1 L measuring cup.

When 1 L is divided into 10 equal units of amount, the amount of 1 unit is called 1 **decilitre**.

1 decilitre is written as 

Summary

- We can use 1 dL measuring cup for measuring the portion that is less than 1 L.
- When 1 L is divided into 10 equal units of amount, the amount of 2 unit is called 1 decilitre.

Unit 8

Unit: Amount of Water
Sub-unit: 3. Smaller Measuring Cups
Lesson 2 of 2

Textbook Page : p.101~102
Actual Lesson 070

Sub-unit Objectives

- To think of ways to measure the portion that is less than 1 L and that cannot be measured with 1 L measuring cup.
- To know the unit dL and the relation of 1 L = 10 dL, and to understand the simple unit conversion between dL and L.

Lesson Objectives

- To measure various amounts of water with 1 L measuring cup and 1 dL measuring cup.
- To understand the relationship between 1 L and dL.

Prior Knowledge

- Let's compare Amount of Water Lesson # 4 (Grade 1, Unit 13)

Preparation

- Containers that are bigger than 1 L, Containers that are bigger than 1 dL, 1 L measuring cup, 1 dL measuring cup, colored ink pens, tape, bottle, cooking pots, dishes, small cups etc.

Assessment

- Measure the amounts of various liquids in different containers using small measuring cups. F S

Teacher's Notes

Exercise to make 1 L and 1 dL measuring cup

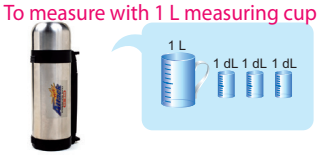
As 1 L measuring cup is common in pupils' daily lives, for example a bottle of mineral water, pupils could easily have the idea of 1 L. However, 1 dL measuring cup is not commonly seen in their daily lives. Teacher should design this lesson as an opportunity for pupils to get used to self-made 1 dL measuring cup and to measure amounts in various containers.

This exercise of making their own 1 L and 1 dL measuring cup will also develop a sense of amount/volume and motivate pupils to measure various amounts of liquid.

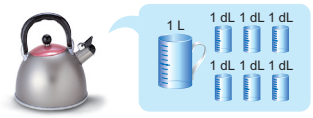
2nd lesson

3 Measure the amounts of water in the thermos and the kettle.

To measure with 1 L measuring cup and 1 dL measuring cup

1 

1 L 3 dL

2 

1 L 6 dL

To measure the mount of the water

4 Measure the amounts of water in various containers using 1 L and 1 dL measuring cups.



Amounts of Water

Container	Amount
Thermos	5 dL
Pot	1 L 2 dL

Making a 1 dL Measuring Cup

Exercise of making 1 dL measuring cup

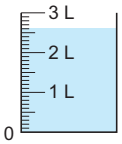
Fill the 1 dL cup with water, pour the water into a container, and mark off the level of water.



□ − □ = 101

5 Let's find the amount of milk in the container on the right.

Unit Conversion, Reading marks on a measuring cup



1 How many L and dL are there?

2 L and 6 dL smaller marks

2 L 6 dL.



2 How many dL are there?

2 L = 20 dL, so when it is added with 6 dL, the total will become 26 dL.

2 L	6 dL
2	6 dL

2nd lesson

Finding Amount

1 There is a plastic bottle containing 6 dL of juice, and another plastic bottle containing 8 dL of juice.



1 How many L and dL are there altogether?

6 dL + 8 dL



2 What is the difference between the two bottles?

Exercise

Let's find the answers.

① 2 L + 3 L ② 9 dL − 4 dL ③ 5 dL + 7 dL

102 = □ + □

Lesson Flow

INTRODUCTION

1 Review.

T/P Review key ideas from the previous lesson.

BODY

2 Introduce main Task

T Introduce and explain the main task, "Let's measure the amount of water with the 1 dL measuring cup you made"

3 ③ Measure the amount of water in a thermos and kettle.

T Guide pupils to 'Make a 1 dL Measuring Cup' to use in the activity.

TN Instruct pupils to prepare a cup that is made of transparent material such as honey cups and jam jars. Transfer the water filling a 1 dL measuring cup into the prepared cup, and mark the container with a coloured ink pen or rubber band to the line where the water reaches.

T Check that pupils accurately measured 1 dL of water.

P Use the 1 L measuring cup for a start, then use 1 dL measuring cup for the rest of the amount.

TN In the case of the textbook, pupils measure a cup of 1 L measuring cup first, and count how many 1 dL measuring cups are used for the rest of the amount of water.

P Answer activity ① ②

TN Accept pupils who noticed that 1 L 3 dL can be also expressed in a single unit (simple concrete number) such as 13 dL and briefly mention about the two different expressions for the same amount.

4 ④ Measure the amounts of water in various containers.

P Think of how they can find 5 dL contained in the bottle and 1 L and 2 dL contained in the pan by using 1 L measuring cup and 1 dL measuring cup.

TN Incorporate hands-on activities into the lesson, and have pupils acquire a sense of amount/ volume. If time permits, extra manipulative activities in which pupils can actually measure various amounts of liquid in a class and school by using the 1 dL measuring cup that pupils made.

5 ⑤ Measure the amount of milk with a 3 L measuring cup.

T Carefully explain that the large mark indicates 1 L and the small mark indicates 1 dL on the scale of the cup as pupils are exposed to the 3 L measuring cup for the first time.

TN In reference to the measurement of lengths, instruct pupils to answer the amount by using two different units (compound numbers).

P Answer the activity ① ②

T Guide pupils to understand the unit conversion chart through explanation.

CONCLUSION

6 Summary.

T/P Summarise the lesson by confirming pupil understanding of the main ideas in the lesson.

Sample Blackboard Plan

Date: **Chapter 8**: Amount of Water **Sub-chapter 3:** Smaller measuring cups **Lesson** 1of 1

Main Task: Let's measure the amount of water with the 1 dL measuring cup that you made.

Review

- We can use 1 dL measuring cup for measuring the portion that is less than 1 L.
- When 1 L is divided into 10 equal units of amount, the amount of 2 unit is called 1 decilitre.

Activity

3 Measure the amounts of water in the thermos and the kettle.

①  1 L 3 dL

②  1 L 6 dL

4 Measure the amounts of water in various containers using 1 L and 1 dL measuring cups.

Container	1L measuring cup	1 dL measuring cup	Altogether
Bottle	0	5	5 dL
Cooking pot	1	2	1L 2dL

5 ① 2 L and 6 of smaller units → 2 L 6 dL.

② 26 of smaller units → 26 dL.

Summary

- We can measure almost any amount with 1 L measuring cup and 1 dL measuring cup.

Unit 8

Unit: Amount of Water
Sub-unit: 4. Finding Amount
Lesson 1 of 1

Textbook Page : p.102~103
Actual Lesson 071

Sub-unit Objective

- To understand the rules of addition in amount and be able to calculate addition and subtraction in amount

Lesson Objectives

- To understand the rules of addition and subtraction of amounts.
- To understand how to calculate the addition and subtraction of amounts.

Prior Knowledge

- Addition in Vertical form (Unit 4)
- Subtraction in Vertical form (Unit 5).

Preparation

- 1 L measuring cup, 1 dL measuring, large plastic bottles.

Assessment

- Solve problems to find the amount using addition and subtraction correctly. F S

Lesson Flow

INTRODUCTION

1 Review.

T/P Review key ideas from the previous lesson.

BODY

2 Introduce the main task.

T Introduce and explain the main task “Let’s think how to calculate addition and subtraction in amounts”

3 1 Find the amount of a plastic bottle.

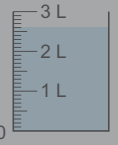
T/P Read and understand the given situation.

T 1 Let’s make a math expression and understand how to calculate the expression.

P 6 dL + 8 dL.

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5 Let’s find the amount of milk in the container on the right.



1 How many L and dL are there?

2 L and 6 dL smaller marks

[ ] L [ ] dL.

2 How many dL are there?

2 L = [ ] dL, so when it is added with 6 dL, the total will become [ ] dL.

The smaller marks indicate dL.



2 L	6 dL
	dL

1st lesson

Finding Amount

Rules of addition in amount, how to calculate addition and subtraction in amount.

1 There is a plastic bottle containing 6 dL of juice, and another plastic bottle containing 8 dL of juice.



1 How many L and dL are there altogether?

6 dL + 8 dL 14 dL

Answer: 1 L 4 dL

1 L is 10 dL...



2 What is the difference between the two bottles?

8 dL - 6 dL = 2 dL

Answer: 2 dL

Exercise

Let’s find the answers.

① 2 L + 3 L 5 L ② 9 dL − 4 dL 5 dL ③ 5 dL + 7 dL 12 dL = 1 L 2 dL

102 = □ + □

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2 There is 2 L 4 dL of juice in the glass bottle, and there is 1 L 8 dL of juice in the plastic bottle. How to calculate

Addition and subtraction of amounts expressed in compound numbers



1 How many L and dL are there altogether?

Write an expression.

2 L 4 dL + 1 L 8 dL

2 Let’s think about how to calculate.

Mero’s idea

2 L 4 dL is ... 24 dL

1 L 8 dL is ... 18 dL

I changed the two amounts of juice into dL.

24 + 18 = 42 42 dL = 4 L 2 dL

Yamo’s idea

2 L	4 dL
+ 1 L	8 dL
4 L	2 dL

I put numbers with the same units in the same column and added.

3 Let’s think about the difference between the two bottles.

2 L 4 dL - 1 L 8 dL = 6 dL

Answer: 6 dL

Can we use the same ideas as in addition?

Exercise

Let’s find the answers.

① 3 L 6 dL + 1 L 8 dL 5 L 4 dL ② 4 L 7 dL + 2 L 3 dL 7 L

③ 6 L 3 dL − 1 L 3 dL 5 L ④ 7 L − 3 L 5 dL 3 L 5 dL

1st lesson

□ − □ = 103

Lesson Flow

P Because the same unit is used for both numbers, we can add the two numbers together.

P The answer is more than 10 dL. We should use two different units, L and dL.

TN Emphasise that we can simply add the two numbers together because the two are expressed in the same unit.

T ② What is the difference between the two bottles?

P 8 dL − 6 dL = 2 dL

TN Allow pupils to calculate the subtraction in the same way as the addition.

4 Exercise:

P Calculate the problems ① ② ③

T/P Correct the answer

5 ② Make a math expression 2 dL 4 dL + 1 L 8 dL,

T ① Let's make a math expression and understand how to calculate the expression.

P Add 2 L and 1 L, and add 4 dL and 8 dL respectively.

P As we did in lengths, we can calculate the amounts when the units are the same.

TN • Ask pupils to convert the unit from L into dL, and calculate the numbers in dL. Then express the answer by using two different units (compound numbers) like ◯ L and ◯ dL.

• Emphasise that the addition can be done in the same unit only, and that two numbers expressed in different units cannot be added altogether. Let pupils realize that it is easy to calculate the addition and subtraction in vertical form.

T Lets pupils calculate the expression in the same way as the addition in the problem on p.102 ① ②

6 Understand how to calculate the expression.

T Allow pupils to calculate the subtraction in the same way as the addition.

P Think about how to calculate 2 L 4 dL − 1 L 8 dL

T ③ Use the ideas in the bubbles from the textbook to guide students to calculate the expression.

T Think about difference between the two bottles

P 24 dL − 18 dL = 6 dL

7 Exercise: ① ② ③ ④

T Let's find the answers

P Calculate the problems

T/P Correct the answer

CONCLUSION

8 Summary.

T/P Summarise the lesson by confirming pupil's understanding of the main ideas in the lesson.

Due to space limitations, the Teacher's Notes is placed on page 166.

Sample Blackboard Plan

Date: **Chapter 8**: Amount of Water **Sub-chapter 4: Finding Amount** **Lesson** 1 of 1

Main Task: Let's think of how to calculate addition and subtraction in amount.

Review

- We can measure almost any amount with 1 L measuring cup and 1 dL measuring cup.

Activity

1 ① Math Expression: 6 dL + 8 dL

- We can add two numbers together because they are expressed in the same unit.

6 dL + 8 dL = 14 dL

14 dL = 1 L 4 dL

- We can use L and dL when the ammount is more than 10 dL.

② Math Expression: 8 dL – 6 dL

8 dL – 6 dL = 2 dL

2 ① Math Expression: 2 L 4 dL + 1 L 8 dL

② Change the unit of amount from L to dL

Mero's idea 2 L 4 dL = 24 dL 1 L 8 dL = 18 dL

24 dL + 18 dL = 42 dL 42 dL = 4L 2dL

Yamo's idea

Calculate in vertical form

	L	dL
	2	4
+	1	8
	4	2

Answer: 4 L 2 dL

③ Find the difference.

Math Expression: 2 L 4 dL – 1 L 8 dL

	L	dL
	2	4
−	1	8
		6

Answer: 8 dL

Summary

- We add and subtract in the same unit.
- Calculation in amount is similar to calculation in length.

Unit 8: Unit: Amount of Water

Sub-unit: 5. Very Small Amount of Water

Lesson 1 of 1

Textbook Page : p.104
Actual Lesson 072

Sub-unit Objectives

- To understand the unit mL that indicates the amount less than 1 dL.
- To understand the relation of 1 L = 1000 mL and 1 dL = 100 mL, and express amounts using the unit mL.

Lesson Objectives

- To know that the unit mL indicates the amount less than 1 dL.
- To find the unit mL used in pupils' environment and understand the relation of 1 L = 1000 mL and 1 dL = 100 mL.

Prior Knowledge

- Let's compare Amount of water Lesson # 4 (Grade 1 unit 13).

Preparation

- Bottles or milk cartons showing amounts in mL, enlarged card showing "mL", 1 L measuring cup, 1 dL measuring cup, paint (coloring)

Assessment

- Collect various containers that have labels of quantity in millimetres (ml) and arrange the containers in order of the increasing amount. F S

Teacher's Notes

Difference between net volume and capacity of a container

We rarely find a container or bottle that is completely full with a liquid such as juice, milk, water, and so on.

The amount in mL or L shown on the container actually indicates the net volume, not the capacity of the container. As pupils may confuse the net volume with the capacity, Teacher should explain the difference between the two by using a transparent bottle.

Name of product	Net Volume	Capacity
Can drink	250mL	XXXX
Water Bottle	330 mL	XXXX
Medicine		
Juice		

1st lesson

Very Small Amount of Water

The meaning of 1 mL

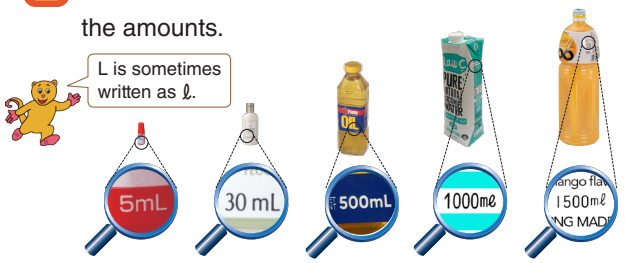
There is a unit called **millilitre** which expresses amount smaller than L or dL.

1 millilitre is written as 1 **mL**.

1 mL 1 mL

1 mL unit around us.

Collect various containers that have mL to show the amounts.



2 Unit conversion between mL and L, mL and dL

Find out the amount of juice in a 1000 mL box.



1. Measure using a 1 L measuring cup. 1 cup
2. Measure using a 1 dL measuring cup. How many cups will it fill? 10 cups

1 L = 1000 mL | 1 dL = 100 mL

104 = □ + □

1st lesson

Lesson Flow

INTRODUCTION

1 Review.

T/P Review key ideas from previous lesson.
"How do we add or subtract amounts of water?"

TN Give an example 2 litres 3 decilitre and 4 litres 2 decilitre to clarify the question.

P By Adding and subtracting in the same unit

2 Main task.

T Introduce the main task "Let's think how to measure amount of water that is less than 1 dL

3 Important point .

T/P Read and understand the important point.

4 1 Collect various containers and look for expression of amounts/volume on them.

T/P Let pupils present the units that were used to express amounts/volume on the containers. Teacher ensure that pupils also get to know and understand that mL is a smaller unit which is used to express amount.

T Ask pupils to closely look at the different containers with their label quantity in mL and try to arrange the containers in order of the increasing amount. Encourage pupils to pay attention to the expression in mL.

TN For the activity, make sure to come up with a sample of a mL measuring cup and show it to the class for utilisation in the activities.

P Practice writing mL in order to incorporate it into the actual exercise.

5 2 Find the number of cups the juice in a 1000 mL carton will fill using a 1 L or 1 dL measuring cup.

T/P Let's measure using a 1 L measuring cup.

P 1 1000 mL will make a 1 L measuring cup full. From this fact, students learned that 1 L = 1000 mL.

P 2 1 L will fill 10cups of 1 dL measuring cup. From this fact, students learned that 10 dL = 1000 mL, similarly, 1 dL = 100 mL

T Guide pupils to recall that the number 1000 is composed of 10sets of 100.

TN Guide pupils not to simply see the relation of 1 L = 1000 mL = 10 dL as unit conversion but also to visualise the actual size of the amount that the units indicate, and grasp a sense of amount/ volume through hands-on activities.

CONCLUSION

6 Summary.

T/P Summarise the lesson by confirming students' understanding of the main ideas in the lesson

Sample Blackboard Plan

Date: **Chapter 8**: Amount of Water **Sub-chapter 5: Very Small Amount of Water** **Lesson** 1of 1

Main Task: **Let's think of how to express the amount of water that is less than 1 dL.**

Review

- We add and subtract in the same unit.
- Calculation in amount is similar to calculation in length.

Activity

There is a unit called **l millilitre** which expresses amount smaller than L or dL.

1 millilitre is written as 1mL

1mL 1mL

1 Collect various containers that have mL to show the amounts.



2 Find the amount of juice in a 1000 mL carton.

1 Measure using a 1L measuring cup.

2 Measure using a 1 dL measuring cup.

1 L = 1000mL 1 dL = 100mL

Summary

- We have mL that is a smaller unit than dL.
- mL is used for many kinds of drinks.
- 1L = 1000 mL and 1dL = 100 mL

Unit 8: Unit: Amount of Water
Exercise
Lesson 1 of 1

Textbook Page : p.105
Actual Lesson 073

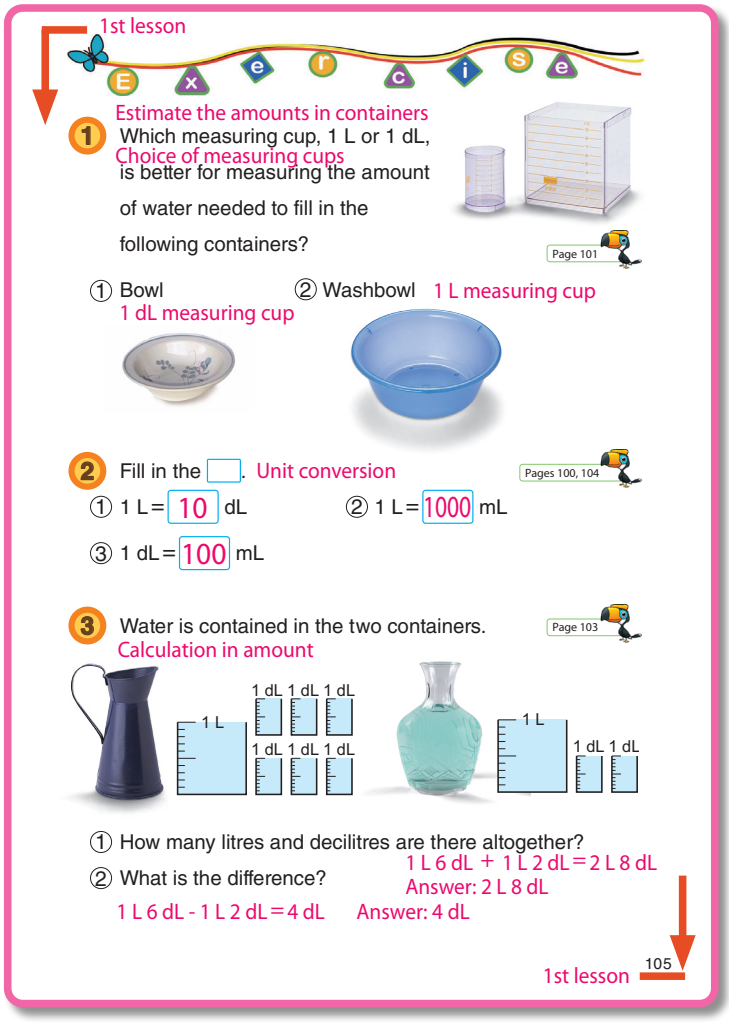
Lesson Objectives
- To deepen the understanding of what has been learnt.

Prior Knowledge
- All the contents learnt in this unit.

Assessment
- Correctly measure the amount of water in various units. F S

Teacher's Notes
Estimating an amount based on a sense of amount and volume acquired through measuring activities

Pupils in 2nd Grade should develop a sense of volume and amount through the exercise of using a 1 L measuring cup and 1 dL measuring cup. Based on their sense of volume and amount, pupils should be able to grasp the size of amount, and to decide which measuring unit cup to use and how many of the measuring unit cup to use. For example, through measuring a 2 dL milk pack and visibly understanding the amount 2 dL, pupils can estimate the size of the amount of a bottle by thinking how many milk packs will fit in the bottle.
The lesson incorporating the measuring activity will form the foundation for understanding the size of amount. Thus, it is especially important for Teacher to secure enough time to engage pupils in measuring exercises.



p.162 Teacher's Notes
Addition and Subtraction
This activity applies the concepts taught in the previous chapters, Unit 4 and Unit 5 with the inclusion of units L and dL.

Important things to consider
- It is important that the units are converted to the same unit (from L to dL)to allow for easy addition and subtraction.
- Calculating the amount is similar to calculating in length
- It is easy to do addition and subtraction in vertical form.

p.168 Teacher's Notes
For Problems 1 and 2, Problem 1 can be given to pupils as homework and checked quickly during the lesson while Problem 2 can be done during the lesson for pupils' problem-solving practices.
1 and 2 should be done within one period.

Lesson Flow

EXERCISE

1. Pupils think which they should use, either 1 L measuring cup or 1 dL measuring cup.
   Teacher lets pupils estimate the amounts in the containers based on a sense of amount and volume acquired through the manipulative activities of measuring,
   In order to develop the sense of amount and volume, the following should be kept in mind.
   ① Start with a simple-shaped container, and gradually go on to a complex-shaped one.
   ② Gradually improve the accuracy of estimation on amounts by repeating the exercise above a number of times.
2. Pupils convert the units in amount.
   For pupils struggling with the problems, Teacher advises to go back to the unit conversion cards on p.100 and p.104. With the assistance of these cards, pupils try to fully master the unit conversion.
3. Pupils practice the calculation of addition and subtraction in amount.
   Teacher should remind pupils that addition and subtraction must be done in the same unit.
   Teacher also advises pupils to use vertical form.

Sample Blackboard Plan

Date: **Chapter 8**: Amount of Water **Exercise** **Lesson** 1of 1

1 Which measuring cup, 1 L or 1 dL, is better for measuring the amount of water needed to fill in the following containers?



① Bowl ② Dish



1 dL measuring cup



1 L measuring cup

2 Fill in the ☐.

① 1 L = 10 dL ② 1 L = 1000 mL

③ 1 dL = 100 mL

3 Water is contained in the two containers.



① How many litres and decilitres are there altogether?

1 L 6 dL + 1 L 2 dL=2 L 8 dL Answer: 2 L 8 dL

② What is the difference?

1 L 6 dL - 1 L 2 dL = 4 dL Answer: 4 dL

Unit 8

Unit: Amount of Water
Problems 1 and 2
Lesson 1 of 1

Textbook Page : p.106~107
Actual Lesson 074

Lesson Objective

- To deepen the understanding of what has been learnt.

Prior Knowledge

- All the contents learnt in this unit.

Preparation

- Handouts or charts of on problems 1 and 2.

Assessment

- Deepen the understanding on how to measure amounts using different units. F S

Lesson Flow

PROBLEMS 1

1 Read the mark where the water reaches
① 2 cups of 1 L measuring cup = 2 L = 20 dL}
4 small marks of 1 L measuring cup = 4 dL} 2 L 4 dL (24 dL)
② 7 small marks of 1 L measuring cup = 7 dL
③ 1 cup of 1 L measuring cup = 1 L}
3 cups of 1 dL measuring cup = 3 dL} 1 L 3 dL (13 dL)
④ 2 cups of 1 L measuring cup = 2 L = 2 dL}
8 small marks of 1 L measuring cup = 8 dL} 2 L 8 dL (28 dL)
Teacher should advise pupils to confirm that 1 small mark of 1 L measuring cup equals a 1 dL measuring cup.

2 Compare the sizes of amounts
① 1 L 3 dL = 13 dL 14 dL is greater.
(Or convert 14 dL into 1 L 4 dL)

Problems 1

1st lesson

1 How much is the amount of liquid?
Reading the marks on a 1 L and 1 dL measuring cup

① 2 L 4 dL
② 7 dL
③ 1 L 3 dL = 13 dL
④ 2 L 8 dL = 28 dL

2 Comparing sizes of amounts
Which amount is larger? Use < or >.

① 1 L 4 dL > 13 dL
② 2 L < 21 dL
③ 3 L 2 dL > 31 dL
④ 1 L 3 dL > 1000 mL

3 Calculation in amount
Let's find the answers.

① 4 dL + 3 dL 7 dL
② 2 L 3 dL + 1 L 2 dL 3 L 5 dL
③ 7 dL + 1 L 1 L 7 dL
④ 9 dL − 4 dL 5 dL
⑤ 3 L 6 dL − 1 L 5 dL 2 L 1 dL
⑥ 1 L 4 dL − 4 dL 1 L
⑦ 4 L 5 dL + 1 L 6 dL 6 L 1 dL
⑧ 3 dL + 2 L 8 dL 3 L 1 dL
⑨ 4 L − 1 L 2 dL 2 L 8 dL

4 Similarities between comparing in amount and in length.
What is similar when comparing the amount of liquid and length? Express both amount and length in number
Both have units.

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Problems 2

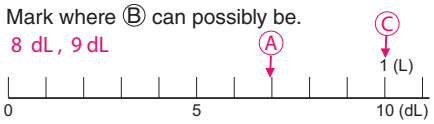
1 There is water in the containers Ⓐ, Ⓑ, and Ⓒ.
Sizes of amounts

Ⓐ 7 dL
Ⓑ dL
Ⓒ 1 L

The containers hold water as follows.

- Amount of Ⓐ < Amount of Ⓑ
- Amount of Ⓑ < Amount of Ⓒ
- The amount of Ⓐ is 7 dL
- The amount of Ⓒ is 1 L

① On the number line, mark where Ⓐ and Ⓒ are.
Mark where Ⓑ can possibly be.
8 dL, 9 dL



② Here is additional information about Ⓑ.
Amount of Ⓒ < 9 dL
How much water is in container Ⓑ? 8 dL
Write down your ideas in your exercise books, and discuss with your friends.
Ⓑ is more than 7 dL and less than 9 dL

1st lesson

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Lesson Flow

② 2 L = 20 dL 21 dL is greater.
③ 3 L 2 dL = 32 dL 3L 2 dL is greater.
④ 1 L 3 dL = {1 L = 1000 mL}1300 mL
{3 dL = 300 mL}
1 L 3dL is greater.
In the similar way to ①, the units must be the same when comparing two amounts.

3 Calculate in amount
① Addition in dL
② Addition in L and dL
③ Addition of a number in L and another in dL
④ Subtraction in dL
⑤ Subtraction in L and dL
⑥ Subtraction of a number in L and another in dL
⑦ Addition in L and dL whose answer is more than 10 dL
⑧ Addition of a number in L and another in L and dL, whose answer is more than 10 dL
⑨ Subtraction that requires the unit conversion from L to dL

4 Think of the similarities between the comparison in length and in amount.

P Write in their own words that both can be expressed in numbers using units, and that both length and amount have universal units.

T Remind pupils to take a note about the convincing opinions, which deepens pupils' understanding.

PROBLEMS 2

1 Pupils read and understand the context of the given problem.

T Confirm with pupils what they are going to find and what they have already known from the given problem.

TN Let pupils realise that they can narrow the possible answers down based on the statements in the problems.

T Confirm the meaning of each inequality sign.

P Solve the problem.

T Advise pupils to give their answer as well as the reason for it.

P Mark where Ⓐ and Ⓒ are on the number line in the textbook.
Ⓑ is more than 7 dL and less than 1 L. So Ⓒ is either 8 dL or 9 dL.

P Read and solve the problems.

T Explain that there is an additional condition to find the answer and explain also that pupils will have only one choice, which is the answer.
It is found that Ⓑ is less than 9 L and by considering this fact and the answer of ①, pupils can reach the answer, which is 8 dL.

Due to space limitations, the Teacher's Notes is placed on page 166.

Sample Blackboard Plan

Date: **Chapter 8**: Amount of Water **Problems 1 and 2** **Lesson** 1of 1

Problem 1

1 How much is the amount of liquid?

① 1 L 1 L 1 L — 2 L 4 dL
② 1 L — 7 dL
③ 1 L, 1 dL 1 dL 1 dL — 1 L 3 dL = 13 dL
④ 1 L 1 L 1 L — 2 L 8 dL = 28 dL

2 Which amount is larger? Use < or >.
① 1 L 4 dL > 13 dL
② 2 L < 21 dL
③ 3 L 2 dL > 31 dL
④ 1 L 3 dL > 1000 mL

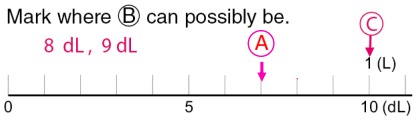
3 Let's find the answers.
① 4 dL + 3 dL 7 dL
② 2 L 3 dL + 1 L 2 dL 3 L 5 dL
③ 7 dL + 1 L 1 L 7 dL
④ 9 dL − 4 dL 5 dL
⑤ 3 L 6 dL − 1 L 5 dL 2 L 1 dL
⑥ 1 L 4 dL − 4 dL 1 L
⑦ 4 L 5 dL + 1 L 6 dL 6 L 1 dL
⑧ 3 dL + 2 L 8 dL 3 L 1 dL
⑨ 4 L − 1 L 2 dL 2 L 8 dL

4 Similarities of comparing the amount of liquid and length.
Express both amount and length in number
Both have units.

Problem 2

1 Ⓐ 7 dL, Ⓑ □ dL, Ⓒ 1 L

① On the number line, mark where Ⓐ and Ⓒ are.
Mark where Ⓑ can possibly be.
8 dL, 9 dL



②How much water is in container (B)? Why?
8 dL
Ⓑ is more than 7 dL and less than 9 dL

End of Chapter Test: Chapter 8 **Date:**

Evaluation: **Chapter 8** **Amount of Water**	Name:	Score /100

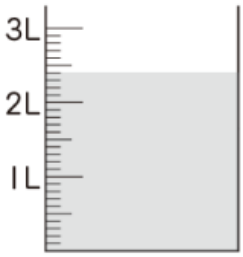
1. What is the volume of the water? [10 points each for all correct answers]

(1) 

_____ L _____dL or _____dL

(2) 

_____ L _____dL or _____dL

(3) 

_____ L _____dL or _____dL

2. Fill in the blank. [10 points each for all correct answers]

(1) 2 L = _____ dL (2) 37 dL = _____ L _____ dL (3) 3000 mL = _____ L

3. Calculate. [10 points for each question]

(1) 1 L 5 dL + 3 dL = _____ L _____ dL

(2) 3 L 4 dL − 1 L 2 dL = _____ L _____ dL

4. Make a math sentence and find the answer.

[10 points for math sentence and 10 points for answer]

There is 1 litre and 5 decilitres of lemon juice. The family drank 1 litre and 2 decilitres. How much is left?

Math sentence _____ Answer _____

Chapter 9 Addition and Subtraction

1. Unit Objectives

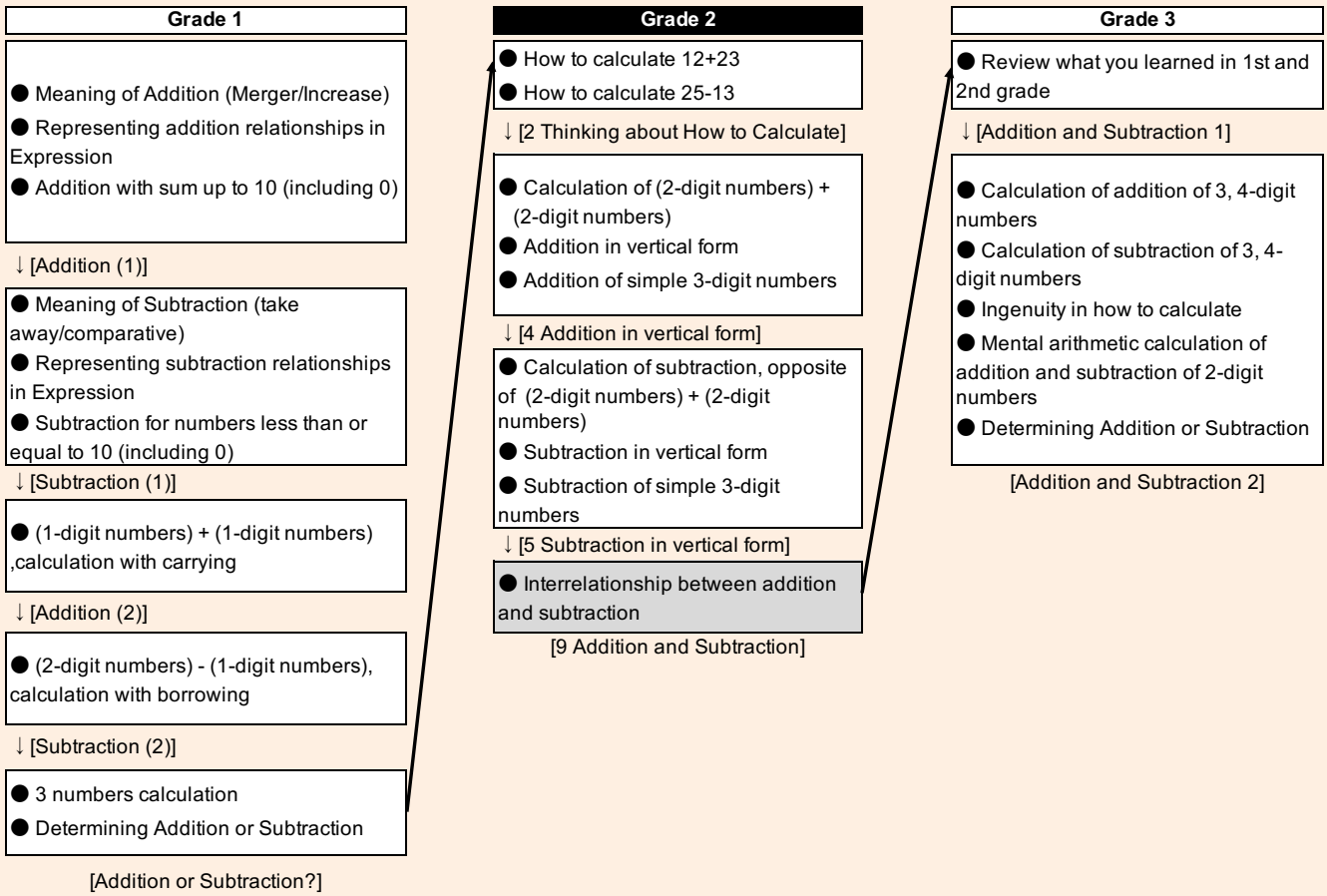
- To deepen the understanding of addition and subtraction, and extend the ability to use the calculations
- To understand the mutual relationships between addition and subtraction and explain them by using math expressions.

2. Teaching Overview

As for addition and subtraction, in grade 1, pupils have learned about simple situations such as together, increase, take away, and difference.
In grade 2, pupils will focus on quantitative relationships in problem situation and expand the situations in which addition and subtraction are used.
In this unit, pupils will learn a series of processes such as accurately reading the problem scene, representing the relationship on tape figures, etc., deciding the calculation based on it, and formulating the problem to solve the problem.
It is important to develop the ability to explain the application of addition and subtraction using tape diagram.

Key Concepts: Addition and subtraction relationship.

3. Related Learning Contents



Unit 9

Unit: Addition and Subtraction
Sub-unit: 1. Addition and Subtraction using Tape Diagrams
Lesson 1 of 9

Textbook Page : p.108~109
Actual Lesson 075

Sub-unit Objective

- Construct math expressions to understand the relationships between addition and subtraction.

Lesson Objective

- To understand the usefulness of tape diagrams through the comparison of pictures and diagrams represented in the situations of the word problems

Prior Knowledge

- Grade 1 Unit 10 (Addition 2).

Preparation

- Drawing paper showing word problem 1 on p.108, Enlarged pictures showing the 6 diagrams on p.108 and 109, drawing papers.

Assessment

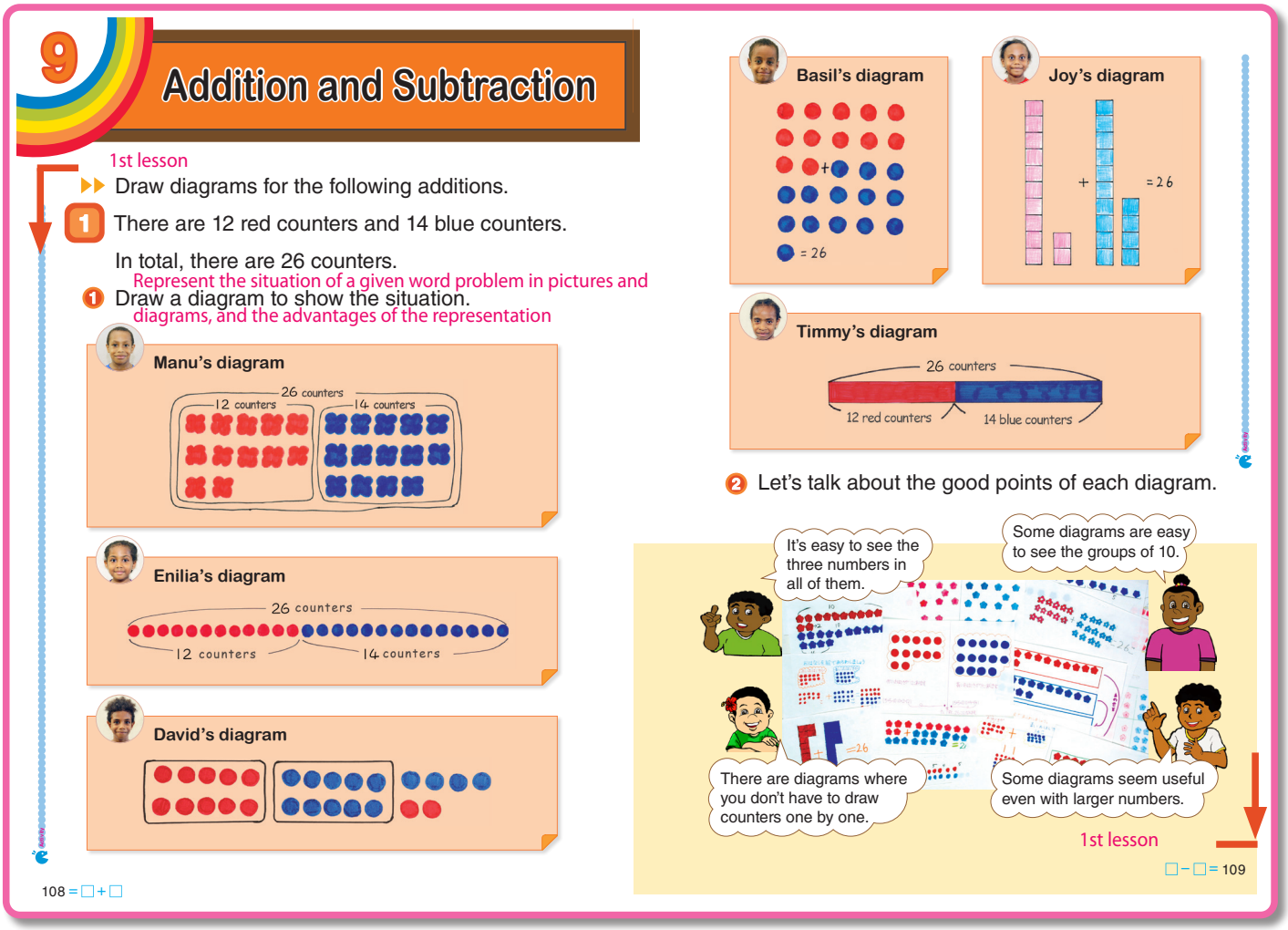
- Draw a tape diagram to show an addition situation. F S

Teacher's Notes

Tape Diagram

When solving a word problem, it is hard for pupils to answer the problem immediately after seeing it. In such case, diagrams function as a visual aid to help pupils understand the situation and identify what the problem is asking. The diagram includes tape diagrams, line diagrams and so on. This lesson introduces the tape diagram for two reasons:

1. The relationship between three numbers can be represented by lining up the numbers in one line.
2. The lengths of tapes represent the size of quantity of concrete objects.



Lesson Flow

INTRODUCTION

1 Review.

T/P Review key ideas from previous lessons.

TN Revise addition of Litres and decilitre

a) 1 L + 2 L b) 4 dL + 2 dL c) 5 dL + 1 L

BODY

2 Introduce the main task.

T Introduce and explain the main task, "Let's show numbers in a picture and a chart".

3 ① Understand the given situation.

T/P Read and understand the situation

T ① Explain the meaning of the word problem by representing the three numbers in a picture.

P Represent the word problem in a picture or diagram and discuss it with their friends.

T/P Let's draw a picture or diagram that represents the meaning of the word problem.
Explain why their diagram or picture is good.

T Ask pupils to discuss the features of each the picture, chart, and diagram.

P Pupils responses:

- Manu shows a set of 12 red counters and a set of 14 blue marbles.
- Enilia lined up all the counters in one line like a line diagram.
- David grouped ten counters as a set of 10 first, and then shows the rest of the marbles as singles.
- Basil lined up 5 counters in one line to count by fives.
- Joy drew a counters like a tile, and vertically piles up ten tiles and the rest respectively.
- Timmy's diagram shows the number of each marble in a tape diagram.

4 ② Discuss about each diagram.

T/P Discuss the good points of each idea in ①.

TN The pupils should notice that Timmy's diagram does not show quantity of exact object but shows the size of each number because of the set of 10.

TN A demonstration must be done to show that as the numbers increase it would be too many to represent or draw each object on a paper however using the tape diagram is easier because you are representing or drawing the number of objects using the ideas of sets of 10. This will clearly show the 3 numbers on one diagram.

CONCLUSION

5 Summary

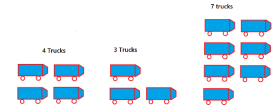
T/P Summarise the lesson by confirming pupils' understanding of the main ideas in the lesson.

Sample Blackboard Plan

Date: **Chapter 9**: Addition and Subtraction **Sub-chapter 1:** Addition and Subtraction using Tape Diagrams **Lesson** 1 of 9

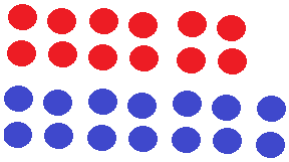
Main Task: "Let's show numbers in a picture and a chart"

Review

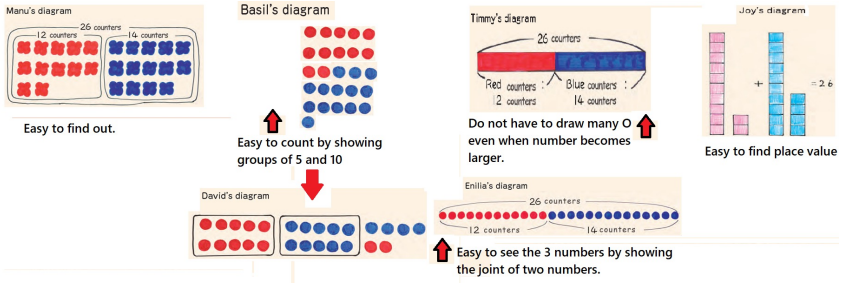


4 trucks and 3 trucks make 7 trucks altogether

Activities



There are 12 red counters.
There are 14 blue counters.
In total there are 26 counters in total.



Summary

Timmy's Diagram have two good points;

1) We do not have to draw many objects when we use Timmy's idea
2) A tape diagram makes it easy to see the relations between the three numbers

Unit 9

Unit: Addition and Subtraction
Sub-unit: 1. Addition and Subtraction using Tape Diagrams
Lesson 2 of 9

Textbook Page : p.110
Actual Lesson 076

Lesson Objective

- To understand situations of given word problems and draw the situations in diagrams to make math expressions and find the answers.

Prior Knowledge

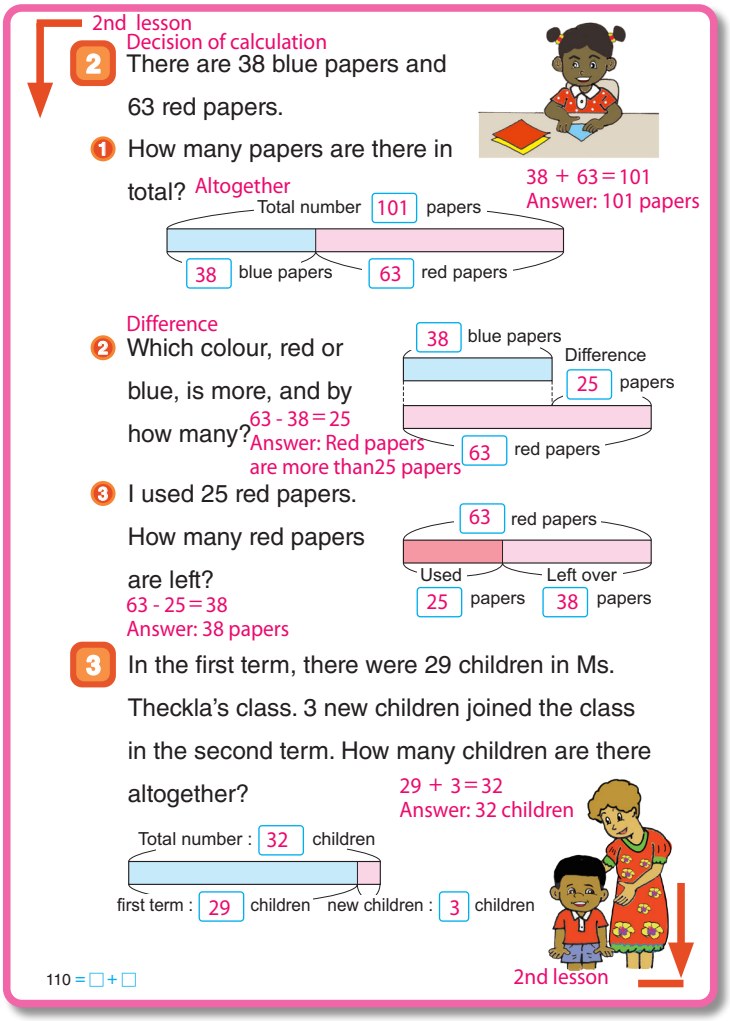
- Grade 1 Unit 10 (Addition 2).

Preparation

- Drawing paper showing the word problem of 1 on p.108, Enlarged pictures showing the tape diagram of 2 1 2 3 on p.110, digital textbook software (if available).

Assessment

- Use tape diagrams to solve Math problems. F S



Teacher's Notes

Diagrams and understand of aim of problems

In word problems, it is important for pupils to read the problems thoroughly, identify what they are asking, and decide on which calculation to use to make math expressions. Teacher lets pupils realise the usefulness of representing the word problems in pictures or tape diagrams in the problem-solving process mentioned above, which helps pupils "mathematically" understand the situation of the word problems.

It is also important for pupils to find key words to help them decide on which calculation to use, such as "difference", "more than", "fewer/less than", "in total", and "altogether". Teacher encourages pupils to carefully read word problems with attention to these key words.

• The situation where addition is applied

1) To identify the size after adding or increasing a number to the ordinal quantities (increase)
2) To identify the size after putting two quantities together (altogether)
3) To identify the position or the ordinal number in a line by counting or moving a given number from the original position to the end (Addition with ordinal numbers)

• The situation where subtraction is applied

1) To identify the remaining numbers after removing or decreasing some from the original quantities (finding the remaining)
2) To identify a difference in quantities between two groups (finding difference)
3) To identify the position or the ordinal number in a line by counting or moving a given number from the original position to the front, or identify the difference between two ordinal numbers (Subtraction with ordinal numbers)

Lesson Flow

INTRODUCTION

1 Review.

T/P Review key ideas from previous lesson.

BODY

2 Introduce the main task.

T Introduce and explain the main task "Let's draw a tape diagram to represent the numbers that you know and do not know".

3 ② Understand the given situation.

T/P Read and understand the word problem

TN Explain to the pupils that the purpose of the activity is to draw a tape diagram. Also remind pupils to use □ for the number that has not been given yet.

4 ① Think of how to represent the given situation.

T Let's write the numbers that you found in the word problem in the □.

P There are 38 blue papers and 63 red papers. We do not know the total number of papers yet.

T Which calculation should we use for the problem? Give your reasons why.

P Addition. Because of the words "in total"

TN Allow pupils to explain why they chose the calculation for the given problem.

T Let's make a math expression and find the answer.

5 ② ② ③ Solve the problem.

P For problem ②, 38 blue papers and 63 red papers.

P For problem ③, there are 63 red papers and we used 25 red papers.

TN Let pupils to explain which calculation they should use and the reasons why.

P For ②, we should use subtraction because we need to find "how many more".

P For ③, we should use subtraction because I found "left overs".

TN Allow pupils to make the math expressions to find the answers.

T/P Confirm the answers for ② and ③.

② 63 − 38 = 25 more

③ 63 − 25 = 38 left

6 ③ Solve problems by themselves.

T/P Read and understand the situation in task ③

T Get the pupils to solve problem using the ideas practiced in task ① and ②.

P Recognise it as an additional problem and find the answer.

TN Confirm that all pupils have solved the problem.

CONCLUSION

7 Summary.

T/P Summarise the lesson by confirming pupil's understanding of the main ideas in the lesson.

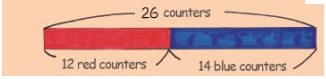
Sample Blackboard Plan

Date: **Chapter 9**: Addition and Subtraction **Sub-chapter 1:** Addition and Subtraction using Tape Diagrams **Lesson** 2 of 9

Main Task: "Let's draw a tape diagram to represent the numbers that you know and do not know"

Review

Timmy's diagram



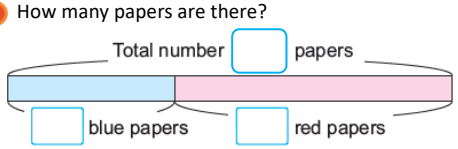
Timmy's Diagram have two good points;

1) We do not have to draw many objects when use Timmy's idea
2) A tape diagram makes it easy to see the relations between the three numbers

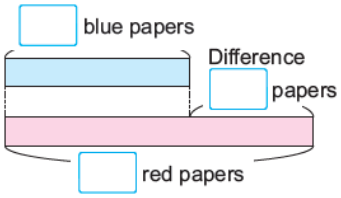
Activities

② There are 38 blue papers and 63 red papers.

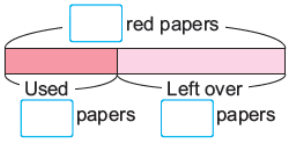
① How many papers are there?



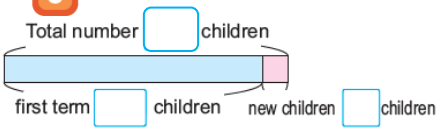
② Which colour, red or blue, is more , and by how many ?



③ I used 25 red papers. How many red papers are left



③



Summary

- We can use ape diagrams to represent known and not known numbers

Unit 9

Unit: Addition and Subtraction
Sub-unit: 1. Addition and Subtraction using Tape Diagrams
Lesson 3 of 9

Textbook Page : p.111
Actual Lesson 077

Lesson Objective

- To understand situations of given word problems and draw the situations in a diagram to make a expression and find the answer.

Prior Knowledge

- Grade 1 Unit 10 (Addition 2).

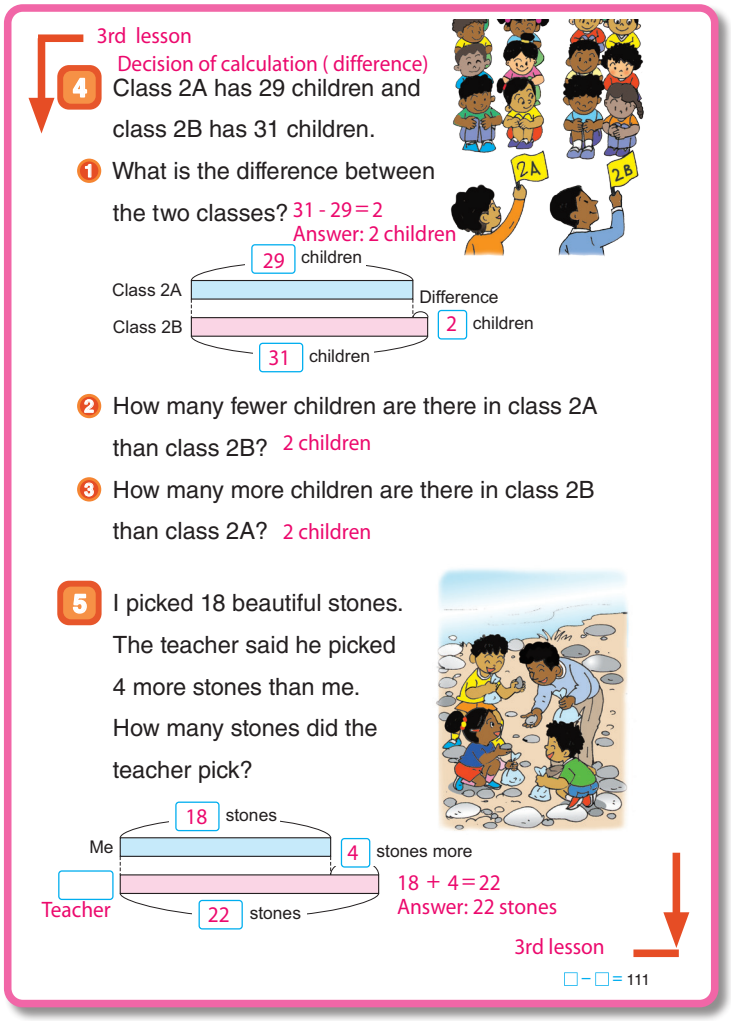
Assessment

- Draw a tape diagram to show the number of stones the teacher collected. F

Teacher's Notes

Reading and understanding of word problems is an important skill which pupils should develop to "mathematically" understand the situation of the word problems. The use of pictures or tape diagrams to represent word problems in the problem-solving process is important and should be emphasised throughout the lesson.

Identifying key words will help them decide on which calculation to use. Words such as "more than" or "fewer/less than" (depending on the subject) are used to find the "difference".



Lesson Flow

INTRODUCTION

1 Review.

T/P Review key ideas from the previous lesson.

BODY

2 Introduce the main task.

T Introduce and explain the main task, "Let's use tape diagrams on challenging problems"

3 4 Read and understand the situation.

T/P Read and understand the situation

P Think about the situation and discuss with friends on how to calculate

4 1 Find the difference between the two classes.

T Instruct pupils to fill in the □ with the numbers they know.

P Write their answers in the □.

T 2 How many children are there in 2A than in 2B class?

P Recognise that it is a subtraction problem.

TN Let pupils realise that "difference" can be represented by either "fewer than" or "more than" depending on what comes as the subject.

Lesson Flow

T ❸ Find out how many more children are there in 2B than in 2A class?

P Work individually or with a friend to solve the problem.

TN Encourage pupils to rephrase a sentence with the use of "less than" or "more than", and vice versa in the sentence. The sentences are different, but they are asking for the same thing.

5 ❺ Read and understand the problem.

T/P Read and understand the situation.

TN Emphasise that the tape diagram should be utilised to decide which calculation to be used.

6 Decide which calculation to use in ❺ and make a math expression.

T Let's write the numbers that are known on the tape diagram.

P "I" picked up 18.
There are 4 more. We do not know the number of stones that the teacher has.

T Which calculation should be used? Give reasons why.

P Addition because it seems that adding the number of stones "I" have and the number "more than" makes the number of stones that the teacher has although we cannot find "altogether" in the word problem.

T Let's make a math expression and find the answer.

P Expression: 18 – 4, answer 22 stones.

TN This lesson aims for the reinforcement of the pupils' ability to draw tape diagrams based on word problems.
Emphasise to the pupils to clearly show what and how much (many) each tape indicates in the tape diagrams.

CONCLUSION

7 Summary.

T/P Summarise the lesson by confirming pupil's understanding of the main ideas in the lesson.

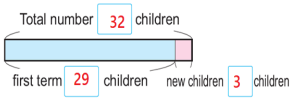
Sample Blackboard Plan

Date: **Chapter 9**: Addition and Subtraction **Sub-chapter 1:** Addition and Subtraction using Tape Diagrams **Lesson** 3 of 9

Main Task: Let's use tape diagrams on Challenging problems

Review

- We can use tape diagrams to represent known and not known numbers.



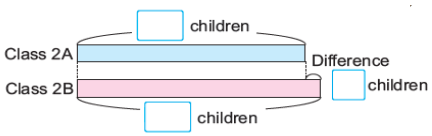
Activities

4
1 What is the difference between the two classes
2 How many fewer children are there in class 2A than class 2B?
3 How many more children are there in class 2B than class 2A?

① "Difference" → Subtraction
② "less than" → Subtraction
③ "more than" → Subtraction
・Asking the same thing although the expressions are different.

The numbers that have been known

Class 1 29 children
Class 2 31 children



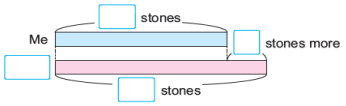
① 31 – 29 = 2
Answer; 2 children
② Answer; 2 children
③ Answer; 2 children

5 I picked 18 beautiful stones. The teacher said she picked 4 more stones than me. How many stones did the teacher pick ?

Addition? But we cannot find "altogether"
Tape Diagram shows subtraction

The numbers that have been known
I have 18 stones
4 more

The number that has not been found yet
Teacher's stone



Calculation;
Adding

18 + 4 = 22
Answer: 22 stones

Summary

What kind of calculation is done when the word 'difference, less than and more than' is used in a word problem?
- To find difference means to subtract.
- To find less than means to subtract.
- To find more than means to subtract.

Unit 9

Unit: Addition and Subtraction
Sub-unit: 1. Addition and Subtraction using Tape Diagrams
Lesson 4 of 9

Textbook Page : p.112
Actual Lesson 078

Lesson Objective

- To understand situations of given word problems and draw the situations in a diagram to make an expression and find the answer.

Prior Knowledge

- Grade 1 Unit 10 (Addition 2).

Preparation

- Drawing paper showing the word problem of 6 and 7 p.112, Enlarged pictures showing the tape diagram of them, digital textbook software (if available).

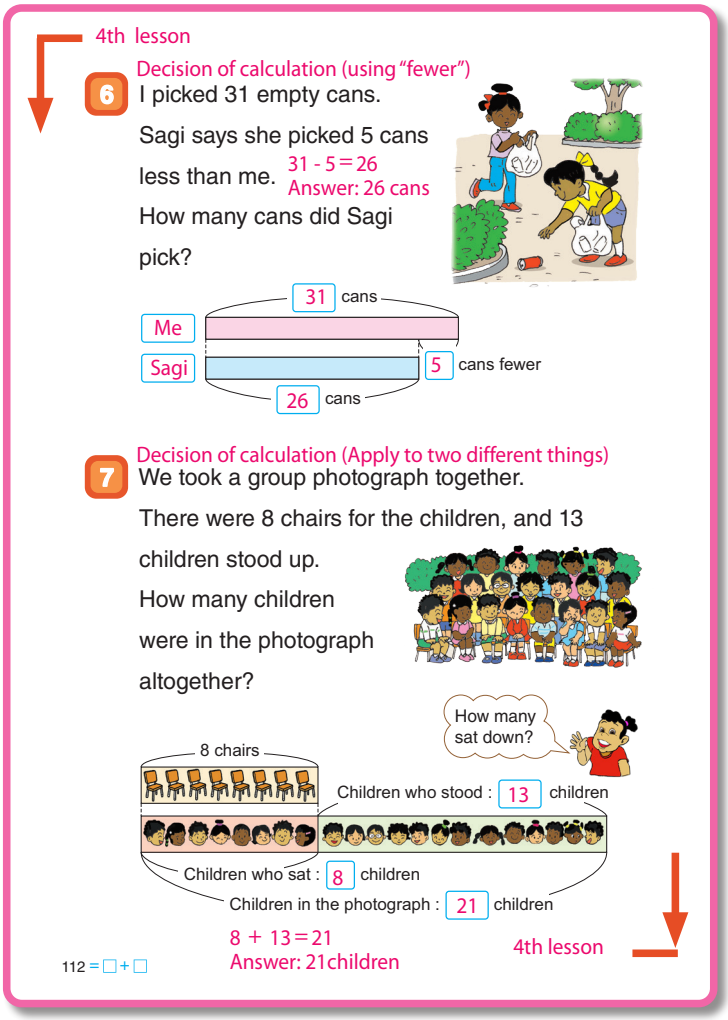
Assessment

- Use diagrams or pictures to make a math expression and find the answer. F S

Teacher's Notes

From this lesson and more, students are going to be given word problems. It is important to give pupils sufficient time to read the problems thoroughly, identify what they are asked to do, and decide on which calculation to be used to make math expressions.

Emphasise the usefulness of representing word problems in pictures or tape diagrams in the problem-solving process. This will help pupils to "mathematically" understand the situation of the word problems.
Find key words to help decide on which calculation to use, such as "altogether".
Teacher encourages pupils to carefully read word problems with attention to the key words.



Lesson Flow

INTRODUCTION

1 Review.

T/P Review key ideas from the previous lesson.

BODY

2 Introduce the main task.

T Introduce and explain the main task "Let's use Tape Diagram for Challenging Problem".

3 6 Pupils read and understand the situation.

T/P Read and understand the problem.

T Get the pupils to solve 6 using the ideas from the previous lesson.

TN Advise pupils to carefully read the problem to find out which tape indicates what and the relations between the two tapes.

T/P Discuss which calculation to use for the problem.

T Get the pupils to draw and fill in the tape diagram.

P Explain why they chose the calculation using the tape diagram and words identified from the problem.

T Let's find out how many cans did Sagi collect?

P Write the expression and find the difference.

4 7 Read and Understanding the problem.

T/P Read and understand the situation.

T What kind of math expression should you make?

P Pupils; expected responses;

- Some children are standing and some are sitting on chairs...I don't think it is subtraction
- Question said altogether. I think it is an addition.
- Can we add 13 "children" and 8 "chairs"?
- We should consider 8 "chairs" as 8 "children" who sat on the 8 chairs.

TN Tell pupils to consider that 1 child takes 1 chair to sit on and there are 8 children sitting on the 8 chairs in total, this should be noted from the phrase "8 chairs for children".

5 Write a math expression.

T Instruct pupils to write the numbers that are known in the tape diagram.

P 8 children are sitting, and 13 children are standing. What we do not know is the total number of children in the group photograph.

T Let's make a math expression.

P Make a math expression and find the answer.
8 + 13 = 21 Answer: 21 children

CONCLUSION

6 Summary.

T/P Summarise the lesson by confirming pupil's understanding of the main ideas in the lesson.

Sample Blackboard Plan

Date: **Chapter 9**: Addition and Subtraction **Sub-chapter 1:** Addition and Subtraction using Tape Diagrams **Lesson** 4 of 9

Main Task: Let's use tape diagrams for Challenging Problems

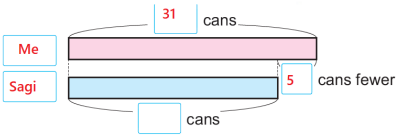
Review

What kind of calculation is done when the word 'difference, less than and more than' is used in a word problem?

- To find difference means to subtract
- To find less than means to subtract
- To find more than means to subtract

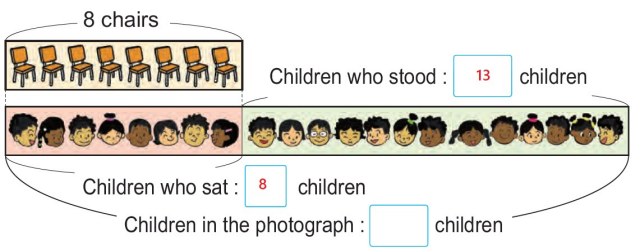
Activities

6 I picked 31 cans. Sagi Picked 5 fewer than me. How many cans did Sagi picked?



31 – 5 =26 Answer: 26 cans

7 We took a group photograph together. There were 8 chairs for children, and 13 children stood up.
How many were in the photograph?



Summary

- Altogether means to add

Unit 9

Unit: Addition and Subtraction
Sub-unit: 1. Addition and Subtraction using Tape Diagrams
Lesson 5 of 9

Textbook Page : p.113
Actual Lesson 079

Lesson Objectives

- To use subtraction for word problems where addition words are used.
- To explain the inverse operation of addition and subtraction by reading tape diagrams and comparing it with the math expressions.

Preparation

- Color tapes (Pink and Orange), work sheets showing tape diagrams, digital textbook software (if available).

Assessment

- Write a Math sentence to express to explain inverse operation of addition and subtraction. F

Teacher's Notes

Pupils have had some experience in solving word problems from previous chapters and the previous grade.
For this activity, the idea is centred around finding the 'total' and 'subset' using tape diagrams.
Subset + Subset = Total
Total – subset = subset

Lesson Flow

INTRODUCTION

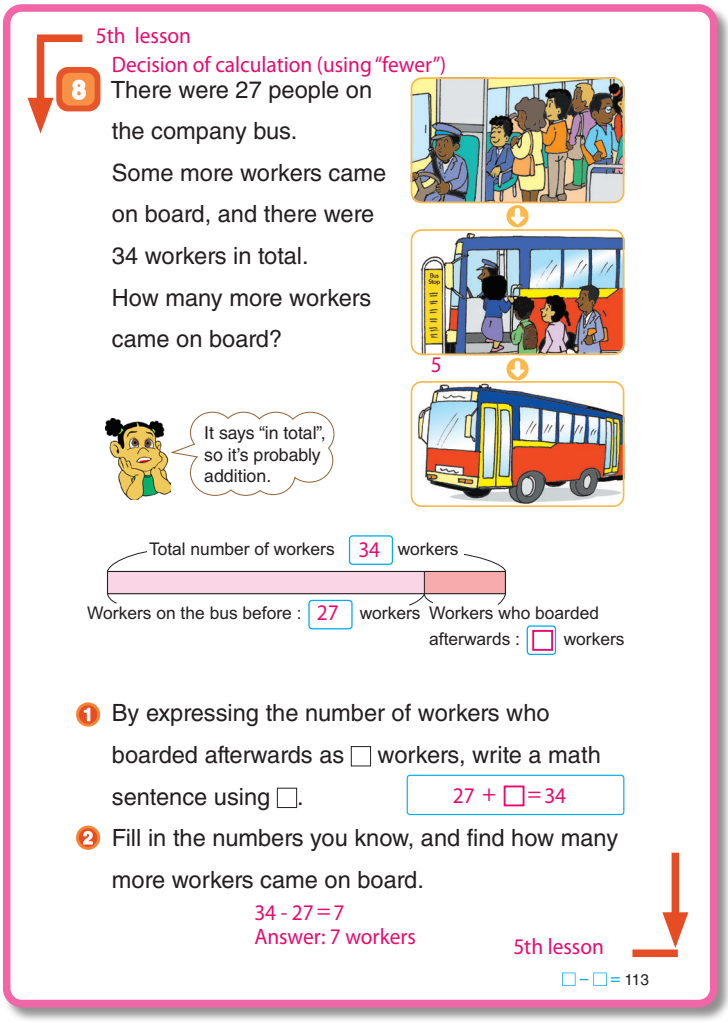
1 Review.
T/P Review key ideas from the previous lesson.

BODY

2 Introduce the main task.
T Introduce and explain the main task "Lets solve Word Problems".

3 8 Read and understand the given situation.
T/P Read and understand the context of the problem.
T Let's write down the known numbers and also find the numbers that are yet to found.
P Think about what they have to find and what they already know.
TN Let pupils to take note of the number of people that were on the bus and also the number that boarded afterwards.

4 Think of ways to calculate.
T/P 1 Read the word problem, and think of how to find the number of workers who boarded afterwards.
T Ask pupils to write a math expression to find how many workers boarded the bus afterwards.
P Write the math expression.
27 + □
TN Instruct pupils to use □ for the number of people who boarded afterwards, and make a



math expression with □ in connection with the tape diagram.

5 ② Solve the problem.

T/P Read and understand the context of the problem.

T Find the answer to the math expression

P Write the number of workers who boarded earlier and the number that boarded afterwards in the □ provided to find the total number of workers on board.

T/P Discuss why subtraction is used for the problem.

T Let pupils to understand that the tape diagram indicates subtraction to find the number in □ although the word "in total" makes pupils easily associates with addition.

TN Reinforce to the pupils the idea of "subset + subset = total" and "total − subset = subset" as well as pupils' ability to write a subtraction expression to find the subset even though the word problems includes a key word in the problem that is associated with addition.

T/P Reflect on the structure learnt in the previous lessons. "total − subset = subset" (learnt on p.69) based on the tape diagram.

P Explain how to use subtraction to find the subset using the tape diagram and how find the total.
Example: Subset + subset = total (27 + 7 = 34)
Example: Total − subset = subset (34 − 27 = 7)

CONCLUSION

6 Summary.

T/P Summarise the lesson by confirming pupils' understanding of the main ideas in the lesson.

Sample Blackboard Plan

Date: **Chapter 9**: Addition and Subtraction **Sub-chapter 1:** Addition and Subtraction using Tape Diagrams **Lesson** 5 of 9

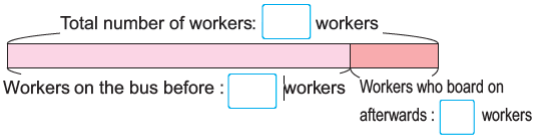
Main Task: Let's solve word problems

Review

- Altogether means to add
- We can make math expression from the tape diagram.

8 Activities

There were 27 people on the company bus.
Some more workers came on board, and there were 34 workers in total .
How many workers on board?



① Math expression with □
27 + □ = 34

② Math expression to find □
34 − 27 = □

Summary

- Tape diagrams helps us to understand word problems clearly.
- To find the subset ,subtract subset from the total.
  Example : 34 − 27 = 7
- To find the total, add the subsets.
  Example : 27 + 7 = 34

Unit 9

Unit: Addition and Subtraction
Sub-unit: 1. Addition and Subtraction using Tape Diagrams
Lesson 6 of 9

Textbook Page : p.114
Actual Lesson 080

Lesson Objectives

- To realise to use addition for word problems where subtraction words are used.
- To utilise tape diagrams to solve the problems requiring the inverse operation of addition and subtraction.

Prior Knowledge

- Previous lesson.

Preparation

- Color tapes (Pink and Orange) , work sheets showing tape diagrams, digital textbook software (if available).

Assessment

- Use tape diagrams to solve the problems requiring the inverse operation of addition and subtraction.
  F S

Teacher's Notes

The activity could be a bit tricky for the students to find the 'total' and 'subset' using the inverse operations of addition and subtraction. The use of tape diagrams can be of very good help. It is important to note that in a subtraction situation pupils will need to know that they can add subset plus subset to find the total.

The same can be done in an addition situation in which a subset is subtracted from the total to find a subset.

Emphasise this to the students:

Subset + Subset = Total

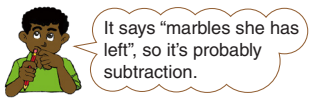
Total – subset = subset

6th lesson

Word Problem with inverse operation of addition and subtraction

9 Freda had some marbles. She gave 6 to her sister. She counted the marbles, and there were 18 left. How many did she have at the beginning?





Marbles at the beginning



1 By expressing the number of marbles Freda had at the beginning as □ marbles, write a math sentence using □. □ - 6 = 18

2 Fill in the numbers you know, and find how many marbles she had at the beginning.

6 + 18 = 24

Answer: 24 marbles

6th lesson

114 = □ + □

Lesson Flow

INTRODUCTION

1 Review.

T/P Review key ideas from the previous lesson.

BODY

2 Introduce the main task.

T Introduce and explain the main task, "Let's solve word problems".

3 Read and understand the problem.

T/P 9 Read and understand the context of the problem.

T Allow pupils to read and explain the meaning of the word problem.

P Read the word problem and decide which calculation they should use.

4 Think of ways to calculate.

T/P 1 Think of how to find the number of marbles left.

T Get the pupils to use numbers from the problem and write them down in the ☐ in the diagram.

P Write the following information in their exercise book.

1. She had some marbles.
2. She gave 6 to her sister.
3. There were 18 left.
4. How many marbles did she have at the beginning?

P Write a math expression to find how many marbles are left.
Expression: ☐ − 6 Marbles left: 18

TN Instruct pupils to use the ☐ for the total number of marbles, the number of marbles she gave away, and make a math expression with ☐ in connection with the tape diagram.

5 2 Solve the problem.

T Guide pupils to use ☐ for the number of marbles that she has at the beginning, and make a math sentence with ☐.

P Write the math sentence and find the answer.
Math sentence: 6 + 18 = ☐ Answer: 24 marbles.

TN Advise pupils to use ☐ for the number that they do not know in order to make the math sentence.
☐ − subset = subset (24 − 6 = 18)
Subset + subset = ☐ (6 + 18 = 24)

CONCLUSION

6 Summary.

T/P Summarise the lesson by confirming pupils' understanding of the main ideas of the lesson

Sample Blackboard Plan

Date: **Chapter 9**: Addition and Subtraction **Sub-chapter 1:** Addition and Subtraction using Tape Diagrams **Lesson** 6 of 9

Main Task: Let's solve word problems

Review

To find the total number .... Addition

Subset + subset = total (27 + 7 = 34)

Total – subset = subset (34- 27 = 7)

To find the subset....Subtraction

Marbles at the beginning ☐ marbles
The marbles given to her sister = 6 marbles
The marbles left = 18 marbles

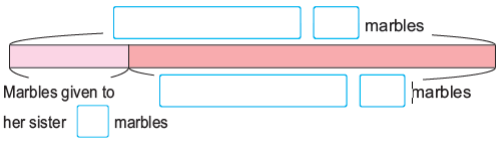
☐ Marbles at the beginning	—	6 Marbles given.	=	18 Marbles left
☐	—	6	=	18
6 Marbles given.	+	18 Marbles left	=	☐ Marbles at the beginning
6	+	18	=	☐
6	+	18	=	24 Answer: 24 marbles

Summary

In a subtraction situation we add the subsets to find the total.
Total – subset = subset
24 - 6 = 18
Subset + subset = Total
6 + 18 =24

Activities

9



Unit 9

Unit: Addition and Subtraction
Sub-unit: 1. Addition and Subtraction using Tape Diagrams
Lesson 7 of 9

Textbook Page : p.115
Actual Lesson 081

Lesson Objective

- To use subtraction to find an unknown subtrahend for a word problem where subtraction is applied.

Preparation

- Color tapes (Pink and Orange), work sheets showing tape diagrams, digital textbook software (if available).

Assessment

- Use subtraction to find an unknown subtrahend for a word problem where subtraction is applied.
  F S

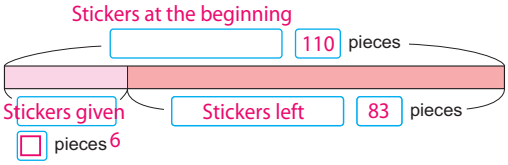
Teacher's Notes

1) From the previous chapters, pupils have had some experience in making math stories. Students should have some ideas of find the 'total' and 'subset' using tape diagrams. This activity requires students to find the subset when the total is given. Assist the students to understand the problem.
2) **Subset + Subset = Total**
   Total – subset = subse

7th lesson The situation where subtraction is applied and find an unknown subtrahend

10 Ali had 110 pieces of stickers. He gave some to his friend, so the number of stickers left became 83.
How many did he give to his friend?





1. By expressing the number of stickers he gave to his friend as □ pieces, write a math sentence using □. 110 - □ = 83
2. Complete the diagram, and find the number of stickers given to his friend.
   110 - 83 = 27
   Answer: 27 stickers

7th lesson
□ – □ = 115

p.186 Teacher's Notes

1) Pupils have had some experience in making math stories from previous chapters. For this activity, the idea is centred around finding the 'total' and 'subset' using tape diagrams.
   Subset + Subset = Total
   Total – subset = subse
2) The following are some explanations that can be used as examples in activity 12

1. First, I know the total number of pencils and the number of pencils left. Then, this problem is asking the number of pencils given. So, I made a math story that there are 9 pencils left after I gave some to my friend from a total of 15 pencils.
2. First, I know the total number of marbles and the number of marbles at the beginning. Then, this problem is asking about the number of marbles I bought later. So, I made a math story that the total number of marbles is 18 after I bought some more and added them to 8 marbles that I had at the beginning.
3. First, I know 23 stickers, 18 stickers and 12 stickers. Then, this problem is asking to find the total number of stickers now. So, I made a math story that is adding 23, 18 and 12 altogether to make the total number of stickers.

Lesson Flow

INTRODUCTION

1 Review.

T/P Review key ideas from the previous lesson.

BODY

2 Introduce the main task.

T Introduce and explain the main task, "Let's solve Word Problems"

3 10 Read and understand the problem.

T/P Read and understand the context of the problem.

T Allow pupils to read and explain the meaning of the word problem.

P Read the word problem and decide which calculation they should use.

4 1 Think of ways to calculate.

T/P Think of how to find the number of marbles left.

TN Let pupils to use numbers from the problem and write them down in the diagram. Advise pupils to find the number of the stickers he gave to his friend.

P Write the following information in their exercise book.

1. He had 110 stickers.
2. He gave some to his friend.
3. There were 83 left.
4. How many stickers did he give to his friend?

P Write a math sentence to find the number of stickers he gave away.

T Instruct pupils to use □ for the number of the stickers that he gave to his friend, and make a math sentence with □.

P 110 − □ = 83

TN Advise pupils to use □ for the number that they do not know in order to make a math expression exactly as the math story proceeds.

5 2 Complete the tape diagram.

T Get the pupils complete the diagram by themselves by filling the □ with numbers and words.

TN Remind pupils of the concept of "total" and "subset".

P Complete the tape diagram.

T Instruct pupils to find the number in the □ based on the tape diagram and explain their reasons.

P Complete the math sentence.

TN Using the tape diagram, explain that subtraction is used to find the "subset".

CONCLUSION

6 Summary.

T/P Summarise the lesson by confirming pupils' understanding of the main ideas in the lesson.

Sample Blackboard Plan

Date: **Chapter 9**: Addition and Subtraction **Sub-chapter 1:** Addition and Subtraction using Tape Diagrams **Lesson** 7 of 9

Main Task: Let's solve word problems

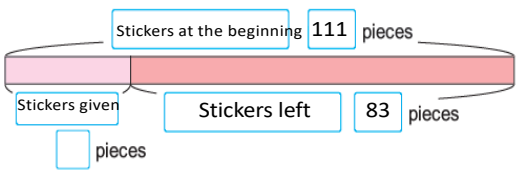
Review

In a subtraction situation we add the subsets to find the total.
Total – subset = subset
24 - 6 = 18
Subset + subset = Total
6 + 18 = 24

Activities

10 Ali had 110 pieces of stickers. He gave some to his friend , so the number of stickers left became 83. How many did he give to his friend

○ Tape Diagram



○ Math expression with □. 111 − □ = 83

○ Math expression to find □. 110 − 83 = 27

Answer: 27 stickers

Summary

Total – subset = subset
110 - □ = 83

Subset +subset = Total
□ +83 =110
□ = 110−83

Unit 9

Unit: Addition and Subtraction
Sub-unit: 1. Addition and Subtraction using Tape Diagrams
Lesson 8 of 9

Textbook Page : p.116~117
Actual Lesson 082

Lesson Objective

- To make a math word problem based on the structure of “total” and “subset” by using a tape diagram.

Preparation

- Enlarged work sheet showing tape diagrams for 11 on p.116 and 12 on p.117, the same work sheets for pupils, digital textbook software (if available).

Assessment

- Make math problems based on the tape diagram to find the ‘total’ and ‘subsets’. F S

Lesson Flow

INTRODUCTION

1 Review.

T/P Review key ideas from the previous lesson.

BODY

2 Introduce the main task.

T Introduce and explain the main task, “Let’s solve Word Problems”.

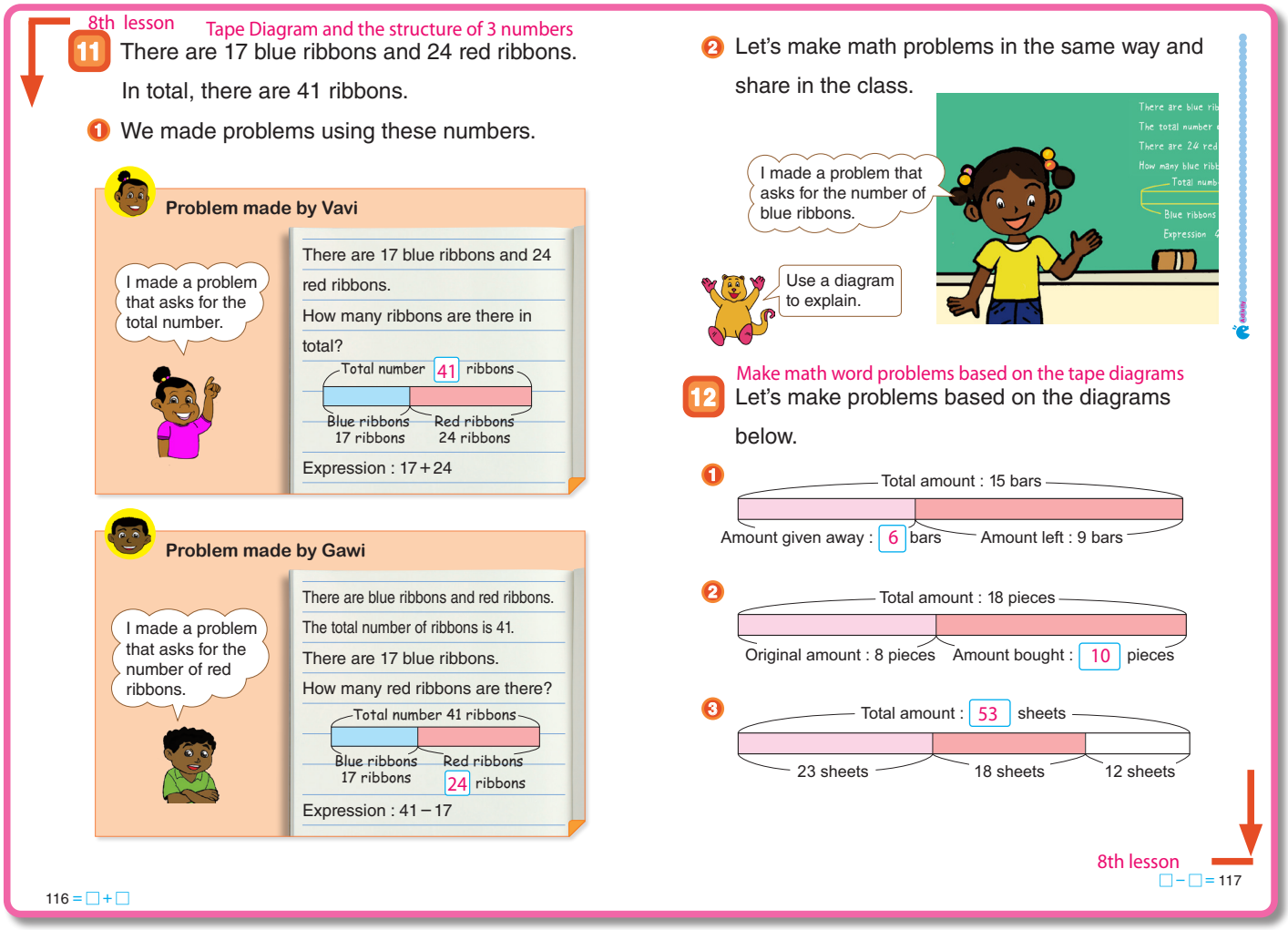
3 11 Read and understand the problem.

T/P Read and think about what calculation can be made from the 3 given numbers.

TN Confirm that we cannot identify what pupils will find in this problem and that there are three-numbers in the problem.

4 1 Read problems made by Vavi and Mero.

T Allow pupils to explain on problems made by Vavi and Mero.



Lesson Flow

P Responses;
- Vavi's problem is to find the total.
  Subset + Subset = Total
- Gawi's problem is to find the Subset.
  Total – subset = subset

5 ② **Make Math problems with three numbers.**

T Instruct pupils to make a math word problem similar to the ones made by Vavi and Gawi.

P Create Math word problems and present them using tape diagrams.

TN Let pupils to realise that they need to use two numbers in the word problem, and the one other be the answer. They have to decide on a number as the answer, and think of how to incorporate the other two into a word problem.

6 ⑫ **Make math word problems based on diagrams.**

T Let pupils confirm the numbers that are known and not known.

P Identify the structure of the numbers, decide what to find, and make math word problems.

P Explain what kind of stories they made by using the tape diagrams.

Example;

① There were 15 pencils. I gave some to my friend, and there are 9 pencils left now. How many pencils did I give to my friend?

② There were 8 marbles at the beginning. I bought some more, and there are 18 marbles in total now. How many marbles did I buy?

③ My elder sister has 23 stickers.
I have 18 stickers, and my younger sister has 12 stickers. How many stickers are there in total?

TN For the calculation, get the pupils to do vertical calculation to find the answer.

CONCLUSION

7 **Summary.**

T/P Summarise the lesson by confirming pupils' understanding of the main ideas in the lesson.

Due to space limitations, the Teacher's Notes is placed on page 184.

Sample Blackboard Plan

Date: **Chapter 9**: Addition and Subtraction **Sub-chapter 1:** Addition and Subtraction using Tape Diagrams **Lesson** 8 of 9

Main Task: Let's solve word problems

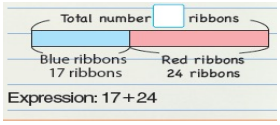
Review

Total – subset = subset
110 - ☐ = 83

Activities

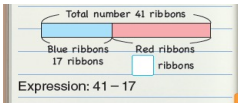
11 Problem made by Vavi

There are 17 blue ribbons and 24 red ribbons. In total, there are 41 ribbons

① 

Problem made by Gawi

There are blue r and 24 red ribbons.
The total of ribbons: 41, Total blue ribbons: 17
How many red ribbons are there?



② Let's make problems based on the diagrams

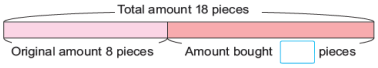
12 ① Tape Diagram



Word Problem (that pupils made)

Math expression with☐
15 - ☐ = 9
Math expression to find ☐, Answer, and Vertical Form
15 – 9 = 6 Answer: 6 bars

② Tape Diagram



Word Problem (that pupils made)

Math expression with☐
8 + ☐ = 18
Math expression to find ☐, Answer, and Vertical Form
18 – 8 = 10 Answer: 10 pieces

③ Tape Diagram



Word Problem (that pupils made)

Math expression with☐: 23 + 18 + 12 = ☐
Math expression to find ☐ : Total amount of sheets...53 sheets

Summary

- To find a subset we subtract a subset from the total. Total – subset = subset
  15 - ☐ = 9
- To find the total we add the subsets

Unit 9

Unit: Addition and Subtraction
Sub-unit: 1. Addition and Subtraction using Tape Diagrams
Lesson 9 of 9

Textbook Page : p.118~119
Actual Lesson 083

Lesson Objective

- To utilise tape diagrams to make math expressions for word problems with ordinal numbers and solve the word problems with set numbers.

Prior Knowledge

- Addition and subtraction in chapter 5.

Preparation

- Enlarged picture of p.118, digital textbook software (if available).

Assessment

- Use tape diagrams to solve problems with ordinal numbers to find 'total' and 'subsets'. F S

Teacher's Notes

Pupils know how to make math stories from pictures from the previous chapters. The activity in this lesson aims at giving pupils the opportunity to make a math expression using the picture of children lining up in a queue. The pupils have to find the answer by checking whom and what position in the picture the word problem is referring to.

Lesson Flow

INTRODUCTION

1 Review.

T/P Review key ideas from the previous lesson.

BODY

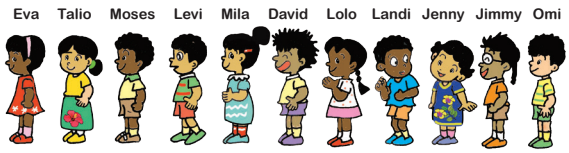
2 Introduce the main task.

9th lesson

Decision of calculation (Apply to ordinal numbers)

13 Children are standing in a straight line.

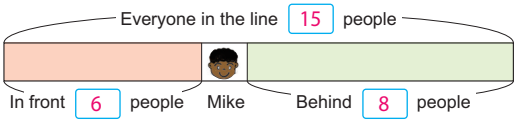
Solve the problems below.



1. Levi is the fourth person from the front. Jenny is fifth behind Levi. What is Jenny's position from the front? 4 + 5 = 9 Answer: 9th children
2. There are 9 children in front of Jimmy. What number is Jimmy's position from the front? 9 + 1 = 10 Answer: 10th children
3. Mila is the fifth person from the front, and is also the seventh from the back. How many children altogether in the line? 5 + 7 - 1 = 11 Answer: 11 children

14 In Mike's line, there are 6 people in front of Mike, and 8 people behind him.

How many people are there in his line?



118 = □ + □

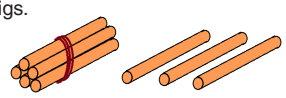
Mathematics Practices in Papua New Guinea
TRADITIONAL WAYS OF COUNTING

In traditional times our ancestors had their own way of counting things. Some counted using stones and sticks to show the number of things while others used parts of the body to represent numbers. Many places did not have many numbers to use so they used groups to tally large number of things. In most parts of Papua New Guinea, the traditional numbers did not go above ten except for a few places so they used groups to represent the exact number of things.

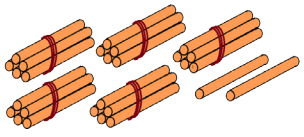
Counting in 5s

Some people used groups of 5 to represent numbers and count easily.

They used a bundle of 5 sticks and 3 single sticks to represent 8 pigs.

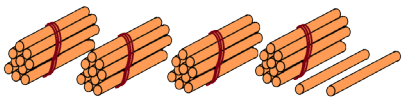


The same idea could be used to count even larger numbers like 27, as 5 bundles of 5 sticks and 2 sticks to represent 27 fish.



Most of the provinces in Papua New Guinea used groups of 10 to represent and count large numbers.

The number of 42 chickens could be represented or counted as 4 bundles of **10 sticks and 2 sticks**.



How did your ancestors count in the old days?

9th lesson

□ − □ = 119

Lesson Flow

T Introduce and explain the main task, "Let's make a math expression by looking at the picture."

3 13 Read and understand the word problem.

T/P 1 Read and understand the problem.

TN Put up the enlarged picture of children lining up on p.118 on the blackboard. Point out where Jenny is standing on the picture.

T What is the math sentence to find Jenny's position?

P Math sentence: 4 + 5 = 9 Answer: 9th child

T What is the answer to question 2?

P Jimmy is the 10th child.

T What is the math expression to find the answer?

P We can find only the number 9 in the word problem so we add 1 for Jimmy himself to the number 9.
Math sentence: 9 + 1 = 10 Answer: 10th child

TN Tell pupils to use the numbers not only from the sentences in the word problems but use the picture or tape diagram to make math expressions. Explain that problem 13 aims at giving pupils the opportunity to make a math expression using the picture of children lining up in a queue.

4 3 Solve the problem.

T Advise pupils to make a math sentence to find the answer to problem 3.

P Present their math sentence.

T/P Discuss pupils findings and confirm the answer that Mila's position is fifth from the front and there are 6 children after her.
Senetnce: 5 + 7 – 1 = 11 Answer: 11 children

5 14 Solve the problem by themselves.

T Let's try problem 14 by using what we learned from problem 13.

P Use tape diagrams to find where Mike is.

T/P Assist pupils make a math expression based on the tape diagram.

TN Assist pupils to realise that neither the 6 people in front of Mike nor the 8 people behind him include Mike. Give a hint to the pupils that there is 1 more person to be included, who in this case is Mike, although the word problem mentions about the 6 people in front of Mike and 8 people behind Mike.

T Lets confirm the answer.
6 + 1 + 8 = 15 Answer: 15 people

CONCLUSION

6 Summary.

T/P Summarise the lesson by confirming pupils' understanding of the main ideas in the lesson.

Sample Blackboard Plan

Date: **Chapter 9**: Addition and Subtraction **Sub-chapter 1:** Addition and Subtraction using Tape Diagrams **Lesson** 9 of 9

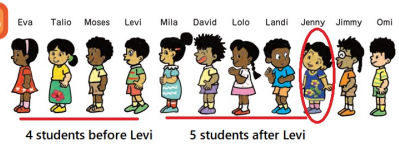
Main Task: Let's make a math expression by looking at the picture."

Review

- To find a subset we subtract a subset from the total.
  Total – subset = subset
  15 - ☐ = 9
- To find the total we add the subsets

Activities

13



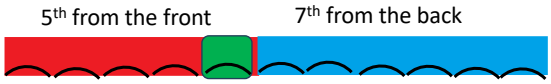
1 What is Jenny's position from front?

Math expression: 4 + 5
Answer: 9th child

2 There are 9 children in front of Jimmy. What is Jimmy's position from front?

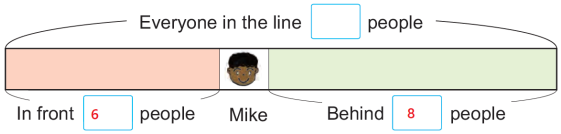
Math expression: 9+ 1. Answer: 10th child

3 Mila is the fifth person from the front , and is also seventh from the back. How many children are there altogether in the line?



Math expression: 5 +7 – 1 Answer: 11 children

14 In Mike's line, there are 6 people in front of Mike , and 8 people behind him. How many people are there in his line ?



Math expression: 6 + 1 +8 Answer: 15 people

Summary

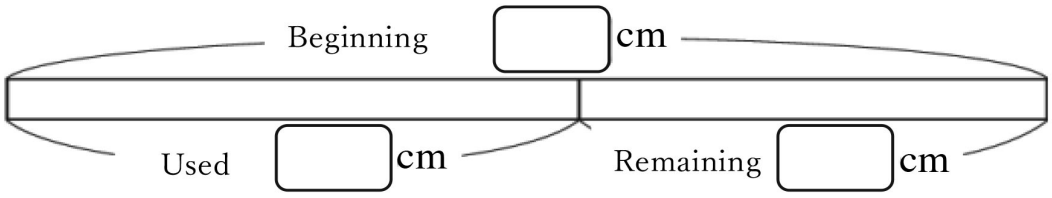
- We can use tape diagram to find the total number by adding the positions

End of Chapter Test: Chapter 9 **Date:**

Evaluation: **Chapter 9** Addition and Subtraction	Name:	Score /100

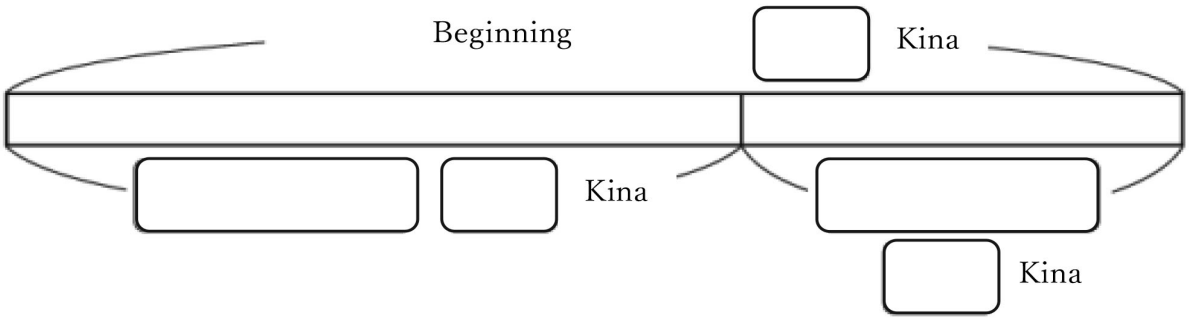
1. Fill in the box, make mathematical sentence and find the answer. [5 points for each]

(1) If you used 33 cm of tape and 27 cm remained, how many centimeters of tape were there to begin with?



Math sentence _____ Answer _____

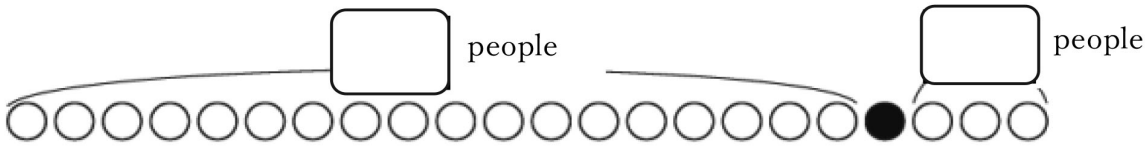
(2) Wesley had 120 kina. After spending some amount, he was left with 45 kina.
How much did he spend?



Math sentence _____ Answer _____

2. Fill in the box, make mathematical sentence and find the answer. [10 points for each]

(1) Skylar has 3 people behind her and 18 people in front of her. How many people are there in total?



Math sentence _____ Answer _____

Chapter 10 Multiplication (1)

1. Unit Objectives

- To understand the meaning and the representations of numbers, and extend their ability to use numbers.
- To consider a number in relation to other numbers by regarding it as a product of other numbers.
- To understand the meaning of multiplication and use the calculation.
- To get to know situations where multiplication is used.
- To get to know situations where multiplication is used, and to understand the meaning of multiplication through activities of representing the situations with algebraic expressions and or interpreting the presented expressions.

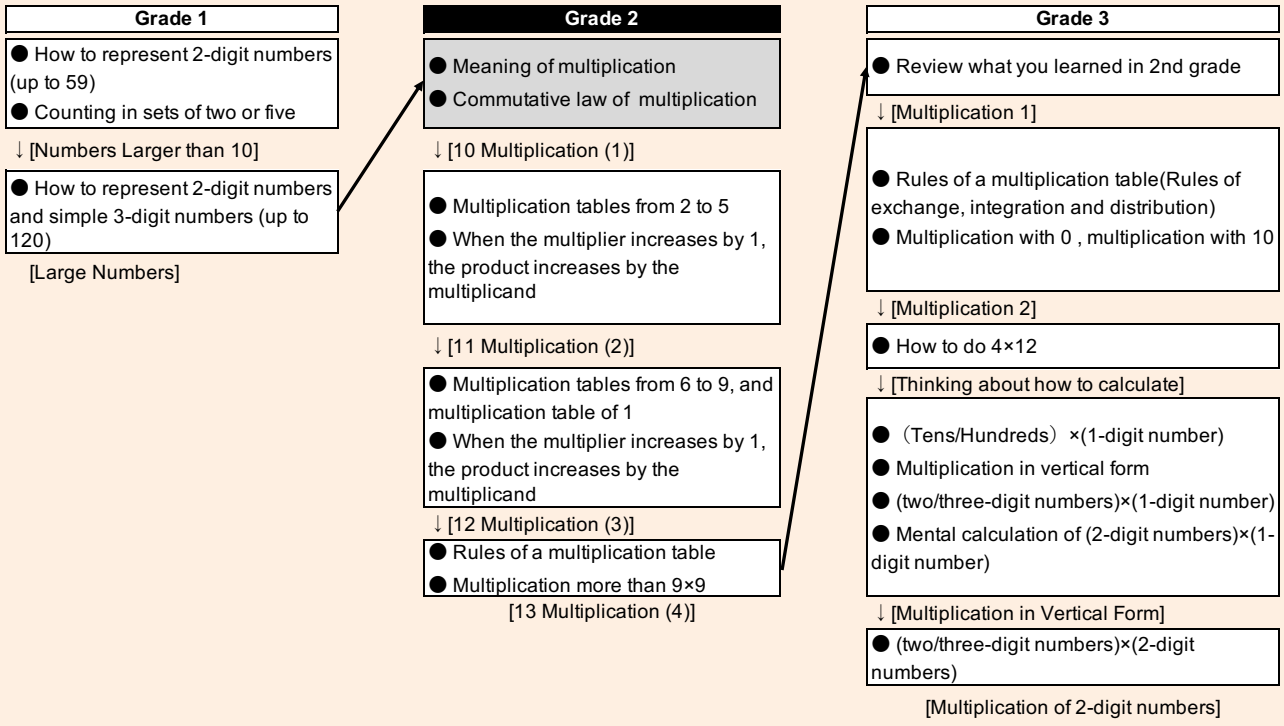
2. Teaching Overview

In grade 1, when counting the number of objects, they had the experience of counting several things at once, such as by 2, by 5, and by 10. In this unit, based on these experiences, pupils will be able to understand the meaning of multiplication through actual situations.
In multiplication, by focusing on “the size of one” and “how many”,
pupils will understand that the total quantity can be grasped, and they will be able to set up the formula for multiplication.

The order for Multiplication: Make pupils understand that in multiplication, the answer is the same even if the multiplicand and the multiplier are interchanged (the commutative law).

Key Concepts: The order of multiplication commutative law

3. Related Learning Contents



Unit 10

Unit: Multiplication (1)
Sub-unit: 1. Sets of the same number
Lesson 1 of 5

Textbook Page : p.120~121
Actual Lesson 084

Sub-unit Objective
- To understand the meaning of multiplication and how to write math expressions of multiplication.

Lesson Objectives
- To understand that when the number of objects on each dish is the same, the total number of objects can be identified with the number of objects on each plate and the number of all the plates.
- To realise the usefulness of counting the total number in such a way.

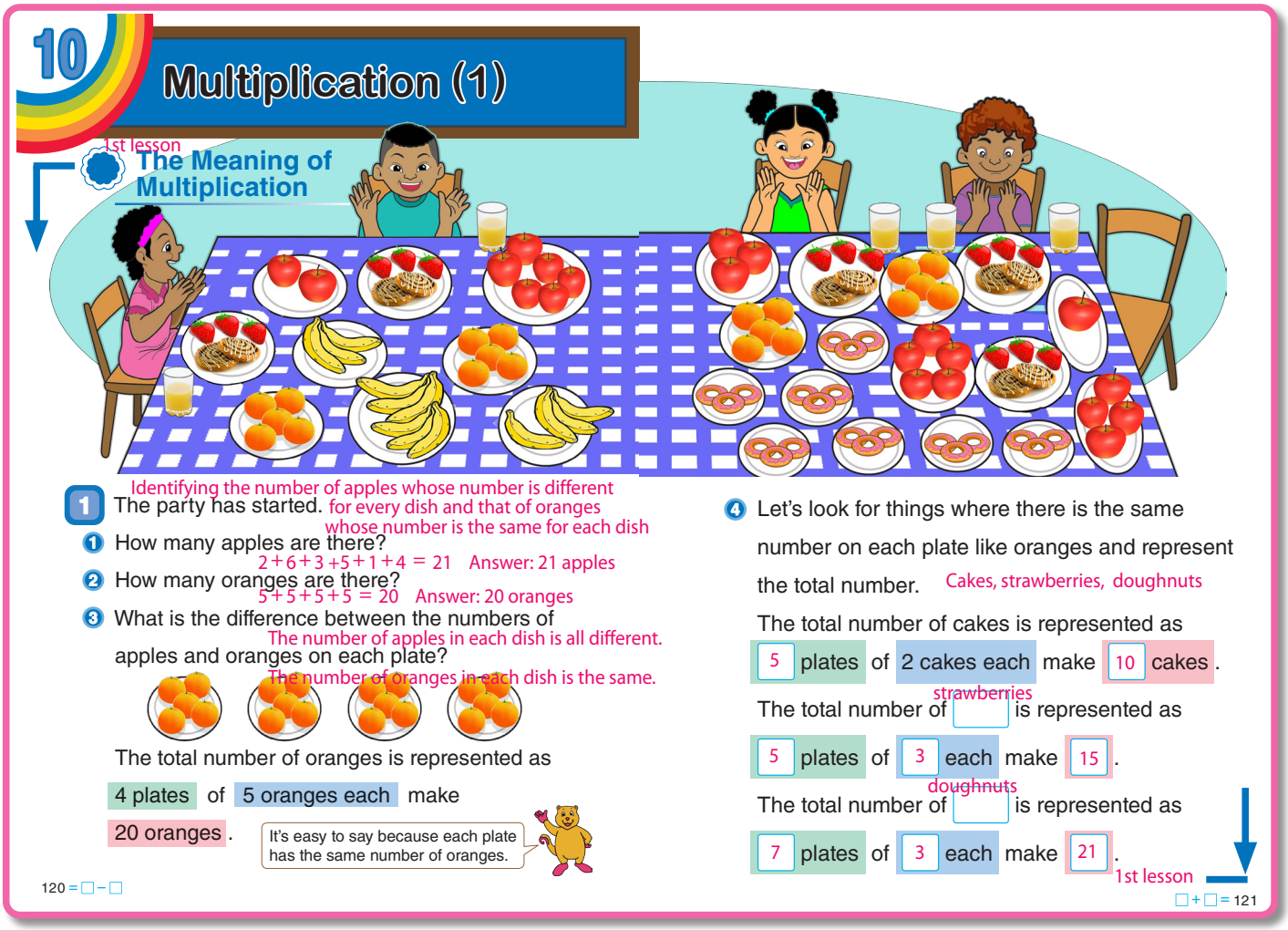
Prior Knowledge
- Addition of 3-digit Numbers (Grade 1 content)
- Pupils have learnt about making expressions with 3 numbers such as 1+2+3.

Preparation
- A chart with enlarged pictures for posting on the blackboard (apples, oranges, strawberries), mathematics blocks.

Assessment
- Identify that when the number of objects on each dish is the same, the total number of objects can be identified with the number of objects on each plate and the number of all the plates. F S

Teacher's Notes
Adding 4 Numbers

Pupils have learnt about making expressions with 3 numbers such as a+b+c. This is their first time to deal with 4 numbers in one expression, such as finding the number of oranges by calculating "5+5+5+5."
Let p-upils gradually understand that this expression has to be addition of 4 numbers by allowing them to manipulate concrete objects and represent the situation in numbers accordingly.



Lesson Flow

INTRODUCTION

1 ① **Discuss the picture or situation.**

T Show the picture of food at a party and allow pupils to freely discuss what they noticed about the pictures on p.120-121 of the textbook.

P Present what they notice from the pictures; the kind of food, the number of plates, the number of fruits and sweets on the plates, etc.

BODY

2 **Introduce the main task.**

T Introduce and explain the Main task, "Let's find how many there are on the plates."

3 **How many are there?**

T ① How many apples are there?

P Answer: 21 apples.

T ② How many oranges are there?

P Answer: 20 oranges.

4 **Compare the number of objects on a plate.**

T ③ "What is the difference between the numbers of apples and oranges on each plate?"

P Discuss the differences they noticed about the number of apples and oranges on the plates.

TN Pupils should be able to realise that the number of oranges on each plate is the same for all the plates; thus, making equal groups. They should also realise that the total number of other foodstuff can be found in various different ways.

P Identify the total numbers of apples and oranges by calculating the expressions 2+6+3+5+1+4 (apples) and 5+5+5+5 (oranges)

T Pose these questions; 1) "How many oranges can be seen on each plate", and 2) how many plates with oranges are there in the picture.

T Bring pupils attention to the expression for oranges 5+5+5+5=20 and compare with the expression, 4 plates of 5 oranges on each plate make 20 oranges.

5 **Making equal groups.**

T ④ Ask pupils to look for things of the same kind that make equal groups.

P Look for things in the picture that are of the same kind and make equal groups such as cakes, strawberries and doughnuts.

T Tell pupils to describe each expression using the phrase "□ plates" of "□ on each plate".

TN To find out the total numbers, pupils can use addition, count one by one, or count by 2s, 3s, 4s, 5s, etc.

P Discuss what is good about the phrases "for □ plates" of "□ on each plate"

CONCLUSION

6 **Summary.**

T/P Summarise the lesson by confirming pupils understanding of the main ideas in the lesson.

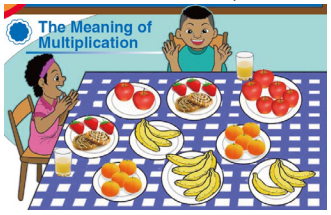
Sample Blackboard Plan

Date: **Chapter 10**: Multiplication (1) **Sub-chapter 1:** Sets of the same number **Lesson** 1 of 5

Main Task: "Let's find how many are there on the plates.".

Introduction

Discuss the situation in the picture.



Activities

1 ① How many apples are there? **21 Apples**
2 + 6 + 3 + 5 + 1 + 4 = 21

② How many oranges are there? **20 oranges**
5 + 5 + 5 + 5 = 20

③ What is the difference between the numbers of oranges and apples on each plate? **Oranges have the same number on each plate making it easy to count.**



5 + 5 + 5 + 5 = 20

4 plates of **5 oranges** make **20 oranges**

④ Look for other things with the same number on each plate.

5 plates of **2 cakes** makes **10 cakes**.

5 plates of **3 strawberries** makes **15 strawberries**

7 plates of **3 doughnuts** makes **21 doughnuts**

Summary

When something of the same kind is equally put on each plate, we say 5 plates of 4 or 2 plates of 6 and so on.

Unit 10

Unit: Multiplication (1)
Sub-unit: 1. Sets of the same number
Lesson 2 of 5

Textbook Page : p.122~123
Actual Lesson 085

Lesson Objectives

- To find the total number of objects based on "the total number of sets" and "the number of objects in each set".
- To learn about how to write and read math expressions of multiplication.
- To understand the notation "×" for multiplication and the meaning of "multiplication".

Prior Knowledge

- Sets of the same number.
- Adding 3 or more numbers.

Preparation

- Pictures for posting on the blackboard (cup-cakes, fish, lollies, pears and biscuits), mathematics blocks, digital textbook software (if available).

Assessment

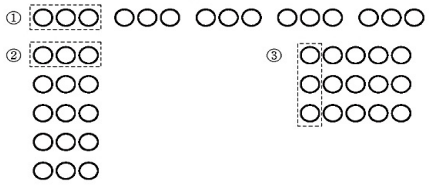
- Write and read math expressions of multiplication. F S

Teacher's Notes

Abstraction and Visualisation of Concrete Objects

Pupils should practice visualising a presented scene in charts or pictures with particular attention to the image of "□ in each set, for □ sets".

For example, when trying to visualise the scene "3 in each dish, for 5 dishes. The chart (3) can be thought of as the most practical and relevant visualisation.



2nd lesson

2 Let's find the total number when there are sets of the same number.

Identifying the total number of objects based on "the total number of sets" and "the number of objects in each set"

1 3 boxes of cupcakes.



3 boxes of 8 cupcakes each make 24 cupcakes.

2 6 packs of fish.



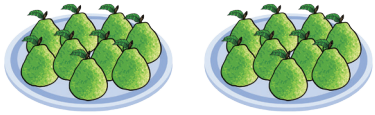
6 packs of 2 fish each make 12 fish.

3 5 bags of lollies.



5 bags of 6 lollies each make 30 lollies.

4 2 plates of guavas.



2 plates of 9 guavas each make 18 guavas.



The total number of cakes is expressed as 5 plates of 2 cakes each make 10 cakes.

This is written as 5×2=10 and read as "5 multiplied by 2 equals to 10".

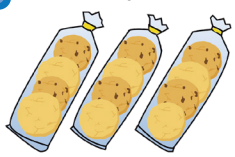
5 (Number of plates) × 2 (Number of cakes for each plate) = 10 (Total number)

This kind of calculation is called **multiplication**.

It's the same as 2+2+2+2+2.

3 How many biscuits are there?

Describe number relations using multiplication expressions



3 (Number of bags) × 4 (Number of biscuits for each bag) = 12 (Total number)

Multiplication is the calculation that is used to get a total when there is the same number for each set.

2nd lesson

122 = □ − □

□ + □ = 123

Lesson Flow

INTRODUCTION

1 Review.

T/P Review key ideas from the previous lesson.

BODY

2 Introduce the Main Task.

T Introduce and explain the main task: "Finding the total number when there are sets of the same number."

3 ② Finding the total number by adding sets of the same number.

T ① State that there are 3 boxes of cupcakes. Each box has the same number of cupcakes. If we want to find out the total number of cupcakes, what information do we need?

P Identify the number of cupcakes in each box and describe the total number of cupcakes in words.

T Let pupils know that the total number of objects can be described with "the total number of sets" and "the number of objects in each set".

P 3 boxes of 6 cupcakes each makes 18 cupcakes.

TN To find the total number, advise students to actually count the objects one by one, count by 2s or calculate by repeated addition.

T Allow pupils to move onto the other problems involving sets.

P Answers;

② 6 packs of 2 fish each make 12 fish

③ 5 bags of 6 lollies each make 30 lollies

④ 2 plates of 9 pears each make 18 pears

4 Review how to find the total number of cakes

TN When there are 5 plates of 2 cakes in each plate, pupils can learn how to write it in an expression.

T Introduce a way of writing the expression "5×2 =10" by associating it with the phrase "5 plates of "2 cakes each" make 10 cakes". and let pupils compare the multiplication expression with an addition expression "2+2+2+2+2=10".

P Practice writing the notation using "×".

5 ③ Multiplying sets to find the total.

T How many biscuits are there?

P Recognise "the number of biscuits in each bag" and "the total number of bags", and make an Expression "3×4=12" and practice reading it aloud.

T Guide pupils to clearly understand that there are 3 bags with 4 in each bag, so it should be written as "3×4" and not the opposite "4×3",

P Learn the term "multiplication" and summarise its meaning by reading the important point in the [ ].

CONCLUSION

6 Summary.

T/P Summarise the lesson by confirming pupils understanding of the main ideas in the lesson.

Sample Blackboard Plan

Date: **Chapter 10**: Multiplication (1) **Sub-chapter 1:** Sets of the same number **Lesson** 2 of 5

Main Task: Finding the total number when there are sets of the same number.

Review

- Review key idea with examples.
- When something of the same kind is equally put on each plate, we say 5 plates of 4 or 2 plates of 6 and so on.

Activities

2 Find the total number when there are sets of the same number.

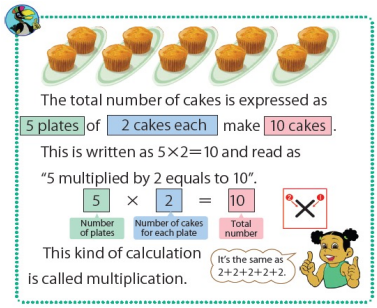
① 3 boxes of 8 cup cakes each make 24 cup cakes.

② 6 packs of 2 fish each make 12 fish.

③ 5 bags of 6 lollies each make 30 lollies.

④ 2 plates of 9 guavas each make 18 guavas.

Explain and discuss multiplication.



3 Find the total number of biscuits.



3 × 4 = 12

Number of bags | Number of biscuits for each bag | Total number

Multiplication:

- Calculations such as 2 x 5 and 4 x 3
- Calculation to find out the total number of something that is making equal groups or sets

Summary

Multiplication is the calculation that is used to get a total when there is the same number for each set.

Unit 10

Unit: Multiplication (1)
Sub-unit: 1. Sets of the same number
Lesson 3 of 5

Textbook Page : p.124~125
Actual Lesson 086

Lesson Objective

- To write multiplication sentences with particular attention to “the number of objects in each set” and “the total number of sets”.

Prior Knowledge

- Read and write math expressions of multiplication.

Preparation

- Enlarged pictures for posting on the blackboard, mathematics blocks, digital textbook software (if available).

Assessment

- Think about how to write multiplication sentences. F S
- Write multiplication sentences. F S

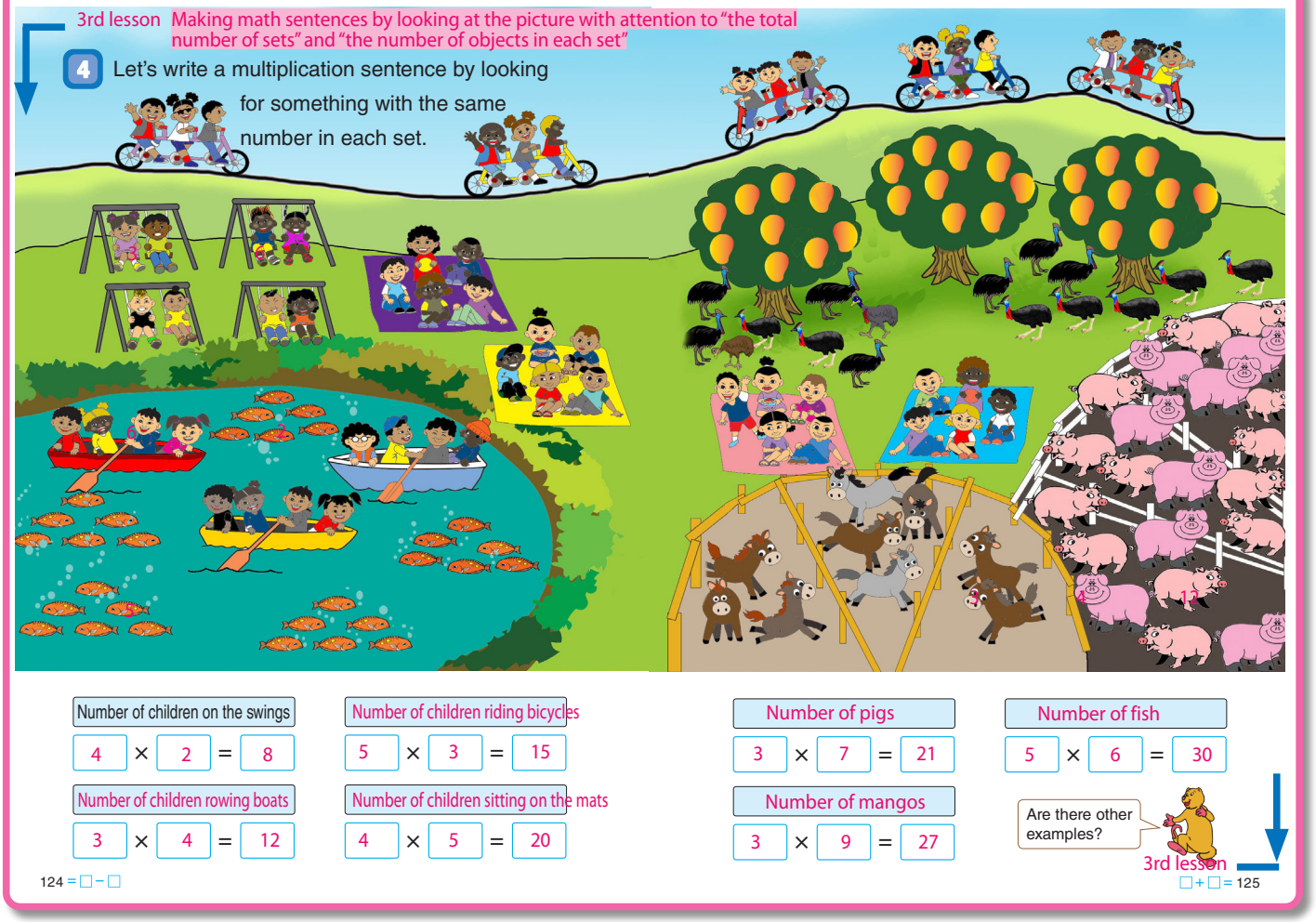
Teacher’s Notes

Finding Scenes of Multiplication in

With the activity in this lesson, let pupils discuss freely and realise that there are various scenes of multiplication in their daily lives.

How to Guide Pupils When They Cannot Fully Understand the Meaning of Multiplication

For pupils who cannot fully understand what “the number of objects in each set” and “the total number of sets” means, let them use the mathematics blocks. Following the instructions to make “□ in each set, for □ sets”, pupils can repeatedly practice grouping the blocks into some sets as specified until they can easily associate the phrases with the block manipulation.



Lesson Flow

INTRODUCTION

1 Review.

T/P Review key ideas learnt in the previous lesson.

T Refer pupils to p.124-125 and look at the pictures.

T/P Discuss what can be seen from the picture.

BODY

2 Introduce the main task.

T Introduce and explain the main task, "Let's write multiplication sentences."

3 4 How to calculate the total number by multiplying.

P Discuss with each other and identify things of the same kinds making equal groups.
Examples; people on each swing or pigs inside each fence, have several sets with the same quantities in each.

T Ask pupils to think about how to calculate the number of mangoes.

P Look at the pictures of trees and discuss how many mangoes there are in each tree and how many trees there are.

TN Pupils should start seeing the situation in terms of "the total number of sets", and "the number of objects in each set" which can help clarify the steps for making multiplication sentences.

P Find out that there are a total of 3 trees in the picture and 9 mangoes in each tree, and make an expression "3×9".

TN For finding the total number of mangoes, at this stage, pupils can count them one by one, by 2s or use addition.

4 Make groups/sets.

P Identify the things in terms of "□ sets/groups and □ in each set/group".

P Write math sentences for each item.

TN For finding the total number, pupils at this stage can count in any way that they are comfortable with.
Note: As an additional activity, Teacher can incorporate story-making activities using the pictures and the math sentences that pupils made to deepen their understanding of the scenes of multiplication.

CONCLUSION

5 Summary.

T/P Summarise the lesson by confirming pupils understanding of the main ideas in the lesson.

Sample Blackboard Plan

Date: **Chapter 10**: Multiplication (1) **Sub-chapter 1:** Sets of the same number **Lesson** 3 of 5

Main Task: "Let's write multiplication sentences."

Review

- Review key idea with examples.
- Multiplication is the calculation that is used to get a total when there is the same number for each set.

Activities

4 Write multiplication sentences for things with the same number in each set.

Number of children on the swings
4 × 2 = 8

Number of children rowing boats
3 × 4 = 12

Number of children sitting on the mats
4 × 5 = 20

Number of children riding the bicycles
5 × 3 = 15

Number of mangos
3 × 9 = 27

Number of birds
2 × 8 = 16

Number of pigs
3 × 7 = 21

Number of fish
5 × 6 = 30

Summary

To write a multiplication sentence, we write the number of sets times the number of objects in each set.

Unit 10: Unit: Multiplication (1)

Sub-unit: 1. Sets of the same number

Lesson 4 of 5

Textbook Page : p.126~127
Actual Lesson 087

Lesson Objectives

- To replace the presented objects with the mathematics blocks and place them in order in consideration of a unit quantity (the number of objects in each set) and the number of sets.
- To find the total number based on the block manipulations.

Prior Knowledge

- Write multiplication sentences with particular attention to “the number of objects in each set” and “the total number of sets”.

Preparation

- Pictures of books, mangoes, pictures of lemons, mathematics blocks.

Assessment

- Enjoy using mathematics blocks to present objects in order in consideration of a unity quantity. F S
- Make mathematics sentences. F S

Teacher’s Notes

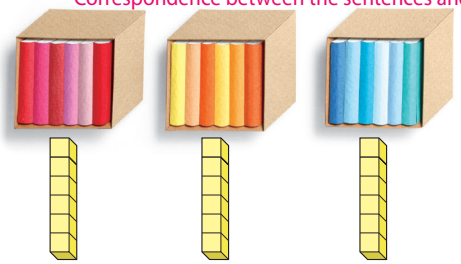
Introduction of the Multiplication Table Pupils should be given opportunities to practice counting concrete objects by making sets of the same number of objects in each set.
It is important that pupils can freely decide on the size of each set (a unit quantity) and identify the total number in such activities.
In this sort of activities, pupils use the mathematics blocks and arrange the blocks to come up with various solutions to the problem.
Teacher should have them realise the aspect of multiplication sentences using the unit quantity.

4th lesson

5 How many are there? Put the blocks in order and write a multiplication sentence to show it.

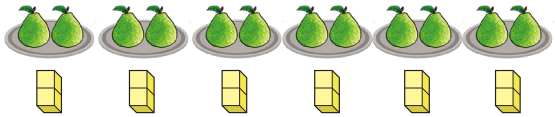
Multiplication sentences based on the number of sets and a unit quantity (the number of objects in each set)
Correspondence between the sentences and the blocks

1 Books



3 × 6 = 18

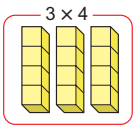
2 Guavas



6 × 2 = 12

6 Represent the presented sentences with the blocks
Let’s line up the blocks in order to show the following multiplication expressions.

1 3×7
2 5×2
3 8×4
4 2×5

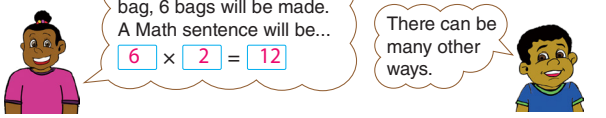


7 Deciding the number of objects in each set and splitting them into the sets,
Put the same number of lemons into some bags.
In what ways can you put them into the bags?
Representing them in math sentences
Let’s write a multiplication sentence.

1 When there are 12 lemons.

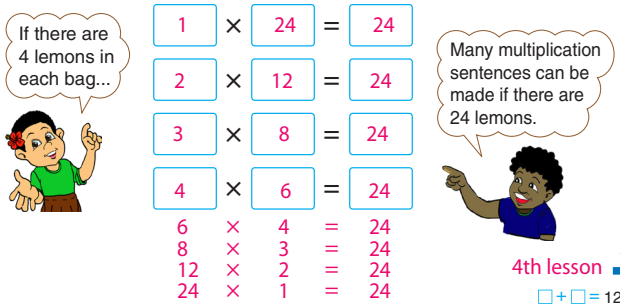


1×12, 2×6, 3×4, 4×3, 6×2, 12×1



2 When there are 24 lemons.





4th lesson

126 = □ − □

□ + □ = 127

Lesson Flow

INTRODUCTION

1 Review.

T/P Review key ideas from the previous lesson.

BODY

2 Introduce the main task.

T Introduce and explain the main task: "Let's represent and write multiplication sentences."

3 5 Read and understand the problem.

T/P Read the problem and discuss how to write a multiplication sentence for the problem.

4 Represent and write multiplication sentences.

T Advise pupils to manipulate or draw blocks and write a multiplication sentence to show how many books there are.

P 1 Line up or draw blocks and write a multiplication sentence to get the total.
Answer: 3×6=18 books.

T Advise pupils to manipulate blocks and write multiplication sentences to show how many guavas there are.

P 2 Line up or draw blocks and write a multiplication sentence to get the total.
Answer: 6×2=12 guavas.

5 6 Line up blocks to show multiplication expressions

TN Pupils should be encouraged to line up the blocks to visualise the given multiplication expressions, and find the answers.
Example; 3×4



3×4 means "3 sets of 4"

P Line up the blocks and find the answer in their own creative ways using the example.
1 3×7, 2 8×4, 3 5×2, 4 2×5

6 7 Think of various ways to make multiplication sentences.

T Refer pupils to p.127 and think of various ways of putting lemons into the bags; in the cases of putting 2 lemons each, 3 lemons each, and so on.

P 1 Represent various ways of putting lemons in bags for 12 lemons using blocks, and make mathematics sentences.

TN As pupils change the number of lemons in each bag, they should also think about how many bags they will get.

TN Emphasise the basic mathematics sentence that (the number of bags)×(the number of lemons in each bag)=the total number of lemons.

T Allow pupils to manipulate the blocks to understand that even when the numbers used in the expressions are the same,
i.e. 6×2 and 2×6, the meaning of each is different.

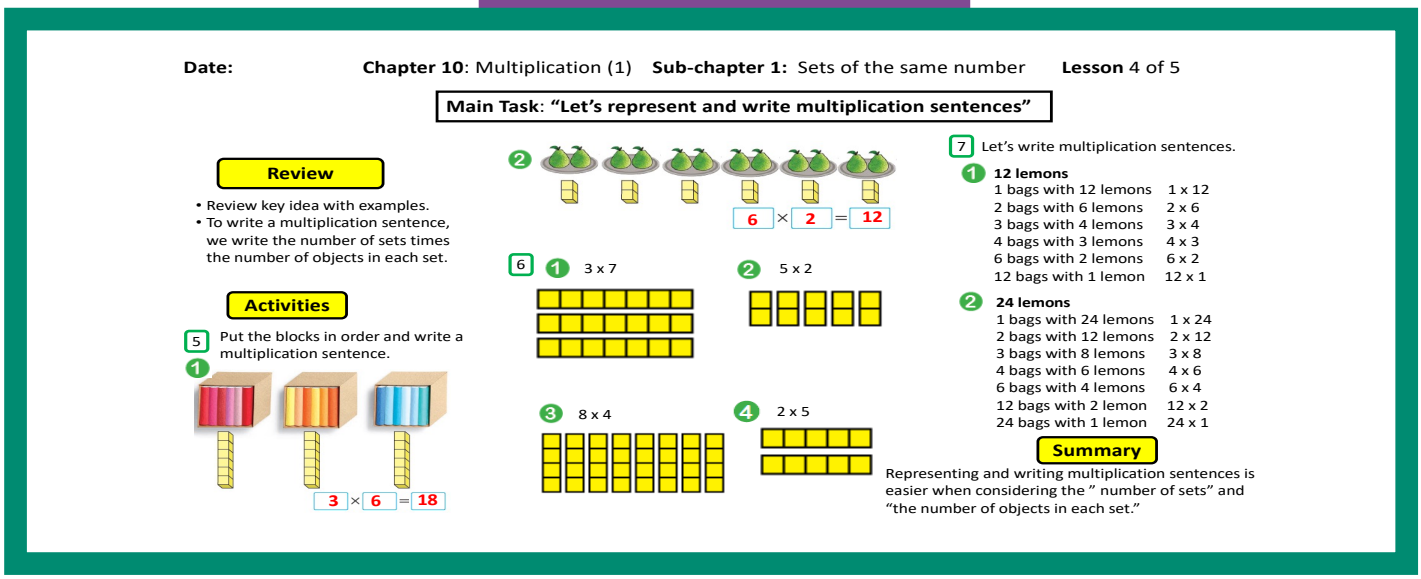
P 2 In the same way as they did with 12 lemons, pupils repeat the exercise for the case of 24 lemons.

CONCLUSION

7 Summary.

T/P Summarise the lesson by confirming pupils understanding of the main ideas in the lesson.

Sample Blackboard Plan



Unit 10

Unit: Multiplication (1)
Sub-unit: 1. Sets of the same number
Lesson 5 of 5

Textbook Page : p.128
Actual Lesson 088

Lesson Objectives

- To make mathematics sentences when dealing with consecutive numbers.
- To learn that 1 piece/set of something is called once/1 time; 2 pieces/sets of something is called twice/2 times; 3 pieces/sets of something is called 3 times.
- To learn that the answers of a multiplication sentence and the repeated addition is the same.

Prior Knowledge

- Introduction of the multiplication table.
- Multiplication sentences based on a unit quantity (the number of objects in each set) and the number of sets, Correspondence between the sentences and the blocks.

Preparation

- Long tape for posting on the blackboard, rulers, mathematics blocks.

Assessment

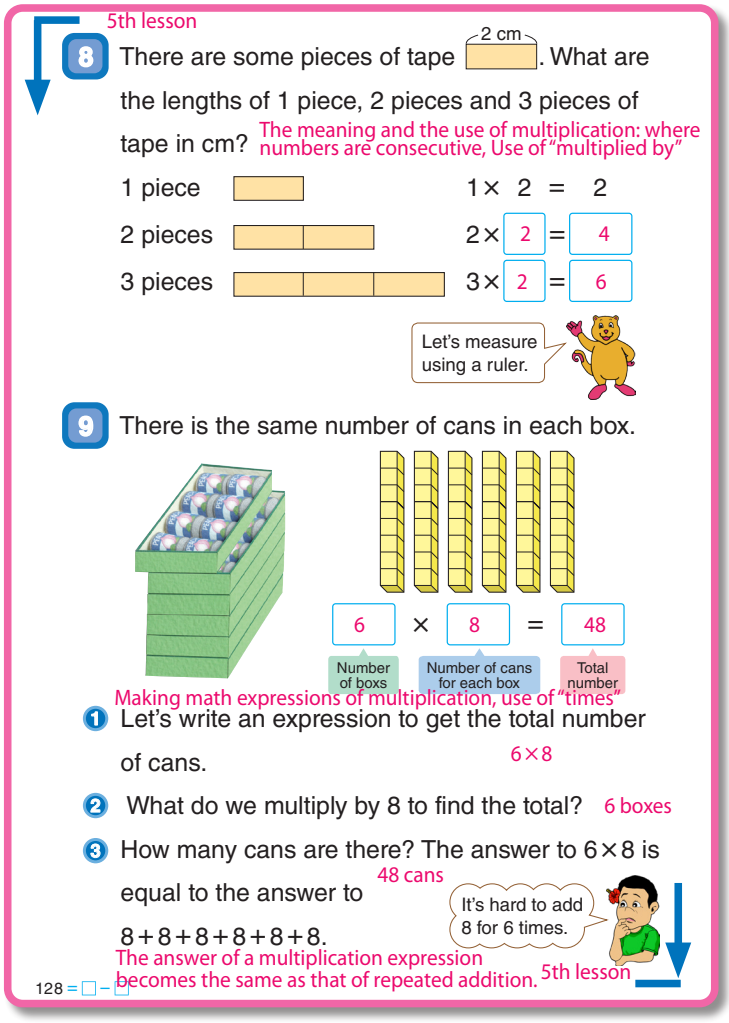
- Make mathematics sentences when dealing with consecutive numbers. F S

Teacher's Notes

Definitions of Multiplication

By showing pupils several multiplication sentences in consecutive order, pupils should be able to think about certain rules that are commonly seen in them such as once, twice, 3 times, etc.

The identification of such rules can be generalised to the definitions of multiplications.



Lesson Flow

INTRODUCTION

1 Review.

T/P Review key ideas from the previous lesson.

BODY

2 Introduce the main task.

T Introduce and explain the main task, "Let's make mathematics sentences when dealing with consecutive numbers."

3 8 Find out the length of a tape.

T Guide pupils to cut a paper tape to make pieces of 2 cm tapes. Then make math sentences and find answers.

P Realise that 1 piece of the 2 cm tape is once/1 time; 2 pieces of it is twice/2 times; 3 pieces of it is 3 times.

TN Remind pupils to practice using the term "times" by saying;
Once/1 time as long as a 2 cm tape is 2 cm.
Twice/2 times as long as a 2 cm tape is 4 cm.
3 times as long as a 2 cm tape is 6 cm.

4 9 Find out the number of tin fish in each box.

P Read the problem on the number of tin fish in each box and make a math sentence to find the number of cans in the boxes.

P Realise that multiplication is the same as doing repeated addition.

T ❶ Let's write an expression to get the total number of cans.

P Make a math sentence 6×8 and understand that this means 6 times 8 cans.

T ❷ What do we multiply by 8 to find the total?

P Response: 6 multiplied by 8

TN By manipulating the mathematics blocks or looking at the blocks placed, pupils understand that the answer of 6×8 is equal to 48.

T ❸ How many cans are there?

P Calculate 8+8+8+8+8+8 and identify that the answer of 6×8 is the same as that of 8+8+8+8+8+8.

5 Sub-unit Problems

T Instruct pupils to do Problems (1) on p.129 as homework.

P Take not of what they need to do for homework.

CONCLUSION

6 Summary.

T/P Summarise the lesson by confirming pupils understanding of the main ideas in the lesson.

Sample Blackboard Plan

Date: **Chapter 10**: Multiplication (1) **Sub-chapter 1:** Sets of the same number **Lesson** 5 of 5

Main Task: "Let's make mathematics sentences when dealing with consecutive numbers"

Review

- Review key idea with examples.
- Representing and writing multiplication sentences is easier when considering the " number of sets" and "the number of objects in each set."

Activities

8 What are the lengths of the 2 cm tapes.

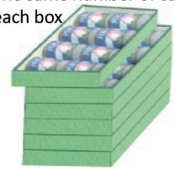
1 piece 1×2 = 2

2 pieces 2× 2 = 4

3 pieces 3× 2 = 6

One piece/set of 2cm is once or I time
Two pieces/sets of 2 cm is twice or 2 times
Three pieces/ sets of 2 cm is 3 times

9 The same number of cans are in each box



6 × 8 = 48

Number of boxes | Number of cans in each box | Total number

❶ Expression: 6 x 8

❷ What do we multiply by 8 to get the total? 6

❸ How many cans are there?
6 x 8 is equal to the answer of
8 + 8 + 8 + 8 + 8 + 8
Answer: 48

Summary

The answers of a multiplication sentence 8 x 6 and adding 8 + 8 + 8 + 8 + 8 + 8 repeatedly are the same.

Unit 10

Unit: Multiplication (1)
Problems 1 and 2
Lesson 1 of 1

Textbook Page : p.129~130
Actual Lesson 089

Lesson Objectives

- To review what has been learnt.
- To make a math expression to represent and find out the number of marbles.

Prior Knowledge

- All content covered so far in this unit on Multiplication.

Preparation

- Marbles, block and worksheets

Teacher's Notes

Teaching Tips

In this unit of "Multiplication (1)", pupils have learnt mainly about the meaning of multiplication. Pupils have practiced many times how to make math expressions of multiplication with attention to "the number of sets" and "the number of objects in each set". Therefore, the objective of this lesson is not to find answers or make math expressions and sentences. This lesson should have pupils realise the usefulness of multiplication and foster their motivation to use it in their daily lives. Exploring various ideas and learning from others should enable them to foster their interests in multiplication.

Problems 1 can be given to pupils as homework and checked quickly during the lesson while Problem 2 can be done during the lesson for pupils' problem-solving practices. Both should be done within one period.

Problems 1

1st lesson

The meaning and the use of multiplication

1 Let's represent these problems using multiplication.

① How many dL of juice are there?



5 packs of 2 dL juice in each pack make 10 dL.

Math sentence 5 × 2 = 10

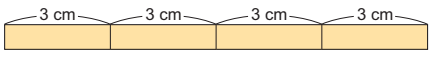
② How many fishes are there altogether?



3 packs of 5 fish in each pack make 15 fish.

Math sentence 3 × 5 = 15

③ How long is this tape in cm?

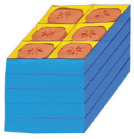


4 pieces of 3 cm each piece make 12 cm.

Math sentence 4 × 3 = 12

Making math expressions of multiplication, Use of "multiplied by"

2 There are 6 cookies in each box.



① Let's write an expression to get the total number of cookies. 5×6

② What do we multiply by 6 to find the total? 5 boxes

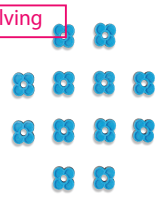
③ How many cookies are there? 30 cookies

129

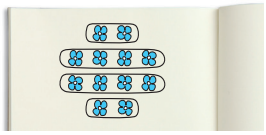
Problems 2

Applying multiplication in problem-solving

1 Line up the counters like the figure on the right.



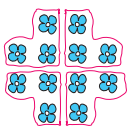
Timothy made the expression, 2+4+4+2 to find out the number of counters on the right. He drew it like the figure on the right.



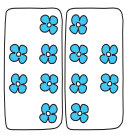
① Timothy made the following expression.

4×3

How did he come to this expression? Draw a figure on the right like Timothy.



② Margaret wants to count the counters like the figure on the right. Write the expression that she made.



Expression 2×6

③ Make various addition and multiplication for finding the number of counters.

6×2
2+4+4+2
2×4+4
3×4, 3+3+3+3

1st lesson

130

Lesson Flow

PROBLEM 1

1 Represent the problems using multiplication

T ① Get the pupils to think about the total amount (dL) of juice based on "the number of sets" and "the amount (dL) per set."

P Write a math sentence and find the answer using the multiplication table or use repeated addition.

T ② Get the pupils to make a math expression of multiplication to find out the number of fish in the boxes.

P Write a multiplication sentence to find the total number of fish in the boxes.

TN If pupils write it as 5×3, Teacher should correct them by advising that the number of fish in each box is the same thing as "the number of objects in each set" and therefore that 3 should come before the 5 and written as 3×5.

T ③ Get the pupils to calculate the length of the tape.

P Write multiplication sentence as 4×3=12 to solve the problem.

2 Make a math expression of multiplication to find out the number of cookies in the boxes.

P ① Write an expression to get the total number of cookies. 5×6

② What do we multiply with 6 to get the total number of cookies? 5 boxes

③ How many cookies are there? 30 cookies

PROBLEM 2

1 Lining up counters to solve problems

① Group the counters by circling them to represent 4×3.

P Make circles with 3 marbles in each circle.

② Look at the picture in the textbook and make a math expression.

P Write the expression 2×6 to represent Margaret's arrangements of sets and number of objects in each set.

③ Think about various ways of grouping the marbles and make math expressions of addition and multiplication to find the total number.

T Tell pupils to think of how to group the marbles and instruct pupils to focus on the size of each group (the number of objects in each group) when grouping the marbles.

P Group marbles in various ways, and make math expressions accordingly.

TN Encourage pupils to also make expressions of addition as well as multiplication.

Sample Blackboard Plan

Date: **Chapter 10**: Multiplication (1) **Sub-chapter:** Problems **Lesson** 1 of 1

Main Task: "Let's understand the order of multiplication."

Solutions

1



① How many dL of juice are there?

5 packs of 2 dL juice in each pack make 10 dL.

Math sentence 5 × 2 = 10

② How many fish are there altogether?

3 packs of 5 fish in each pack make 15 fish.

Math sentence 3 × 5 = 15

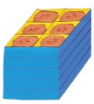
③ How long is the tape in cm?



4 pieces of 3 cm each make 12 cm.

Math sentence 4 × 3 = 12

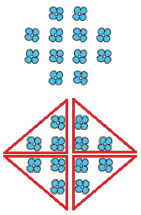
2



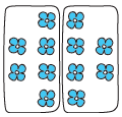
①. Expression: 5 x 6
② 5 times 6
③ 30 cookies altogether

1

①.



②



Expression 2 x 6

③ 2 + 2 + 2 + 2 + 2 + 2
Or 6 x 2

Unit 10

Unit: Multiplication (1)
Sub-unit: 2. The order for multiplication
Lesson 1 of 2

Textbook Page : p.131~132
Actual Lesson 090

Lesson Objectives

- To make mathematics sentences when dealing with consecutive numbers.
- To learn that in multiplication, a pair of the same numbers multiplied gives the same answer.

Prior Knowledge

- Introduction of the multiplication table.
- Multiplication sentences based on a unit quantity (the number of objects in each set) and the number of sets, Correspondence between the sentences and the blocks.

Preparation

- Long tape for posting on the blackboard, rulers, mathematics blocks.

Assessment

- Make mathematics sentences using sets when dealing with consecutive numbers. F S

Teacher's Notes

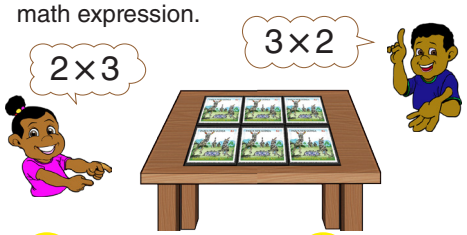
In the lessons leading up to this lesson, pupils have learnt mainly about the meaning of multiplication through understanding that the answer of a multiplication expression is the same as that of repeated addition In this lesson, the main objective is for pupils to understand that changing the order of the 1st and 2nd number in a multiplication expression does not affect the answer which remains the same.
Through the use of groups/sets, pupils should be able to see that this rule is true.

The order for Multiplication



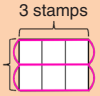
1st lesson

1 Vavi and Naiko are looking at a sheet of stamps on the table. There are 6 stamps. Let's make a math expression.



Vavi's idea

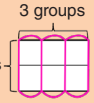
The expression is 2×3



2 groups of 3
3+3=6

Naiko's idea

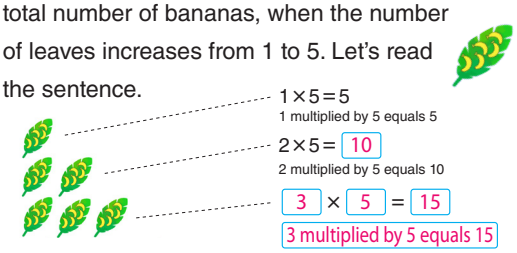
The expression is 3×2



3 groups of 2
2+2+2=6

The number given by "Multiplying 2 by 3" is the same as the number given by " Multiplying 3 by 2". In other words, 2 groups of 3 and 3 groups of 2 give the same answer.
In multiplication, "2 times 3" and "3 times 2" give the same answer. In short, 2×3 is equal to 3×2.

2 There are 5 bananas on each leaf. Let's find the total number of bananas, when the number of leaves increases from 1 to 5. Let's read the sentence.



1×5=5
1 multiplied by 5 equals 5

2×5= 10
2 multiplied by 5 equals 10

3 × 5 = 15
3 multiplied by 5 equals 15

3 Let's consider the following pictures. Let's read the sentence.



5×1=5
5 multiplied by 1 equals 5

5 × 2 = 10
5 multiplied by 2 equals 10

5 × 3 = 15
5 multiplied by 3 equals 15

1 Let's think about the difference compared to **2**.

Kekeni's idea



In the case of 2, 2×5=10
2 multiplied by 5 equals 10.

Gawi's idea



In the case of 3, 5×2=10
5 multiplied by 2 equals 10.

In 2, second number is always 5. However, in 3, first number is always 5.

We learned even if we switch 1st and 2nd numbers, the answer does not change.

1st lesson

□+□=131

132=□−□

Lesson Flow

INTRODUCTION

1 Review.

T/P Review key ideas from the previous lesson.

BODY

2 Introduce the main task.

T Introduce and explain the main task, "Let's make mathematics sentences when sets or objects increase."

3 1 Make mathematics expressions using groups/sets.

T Ask pupils to discuss and make multiplication expressions using the arrangements of the stamps in sets according to Vavi and Naiko's ideas.

P Discuss and make expressions to represent multiplication of sets of the same number.

TN Pupils need to realise that 2×3 is the same as 3×2. The expression they make depends on the sets they have made "times" the number of objects in each set.

4 2 Order of multiplication as the sets increase consecutively.

T/P Read the problem and discuss.

T Advise pupils to express the order of multiplication as the sets increase consecutively.

P Write multiplication sentences using the correct order of multiplication to express the total number of bananas as the sets increase while the objects remain at 5 and read the sentences. Expected Responses: $1 \times 5 = 5$, $2 \times 5 = 10$, $3 \times 5 = 15$, etc.

P Realise that multiplication means the same thing as doing repeated addition.

5 3 Order of multiplication as the objects increases consecutively.

T Remind pupils to express the order of multiplication as the objects increase consecutively.

P Write multiplication sentences using the correct order of multiplication to express the total number of bananas as the objects increases while the set remains at 5.

P Expected answers; $5 \times 1 = 5$, $5 \times 2 = 10$, $5 \times 3 = 15$, etc.

6 Compare the answers in 2 and 3.

T 1 Ask pupils to confirm and compare the answers for 2 and 3.

P Discuss and confirm that in task 2 and 3 the answers are the same.

CONCLUSION

7 Summary.

T/P Summarise the lesson by confirming pupils understanding of the main ideas in the lesson.

Sample Blackboard Plan

Date: **Chapter 10**: Multiplication (1) **Sub-chapter 2:** The order for multiplication **Lesson** 1 of 2

Main Task: Let's make mathematics sentences when sets or objects increase."

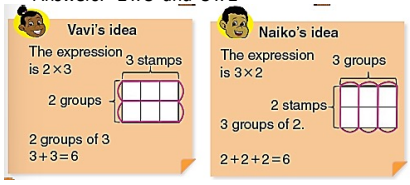
Review

- Review key idea with examples.
- Representing and writing multiplication sentences is easier when considering the " number of sets" and "the number of objects in each set."

Activities

1 .Make math expressions for the stamps.

Answers: 2 x 3 and 3 x 2



2 Find the number of bananas when the sets increase



3 Find the number of bananas when the object increases.



Summary

A pair of numbers switched and multiplied gives the same answer..

Unit 10

Unit: Multiplication (1)
Sub-unit: 2. The order for multiplication
Lesson 2 of 2

Textbook Page : p.132~133
Actual Lesson 091

Lesson Objectives

- To make mathematics sentences when dealing with consecutive numbers.
- To learn that even if the first or second numbers are switched, the answer does not change.

Prior Knowledge

- Introduction of the multiplication table.
- Multiplication sentences based on a unit quantity (the number of objects in each set) and the number of sets, Correspondence between the sentences and the blocks.

Preparation

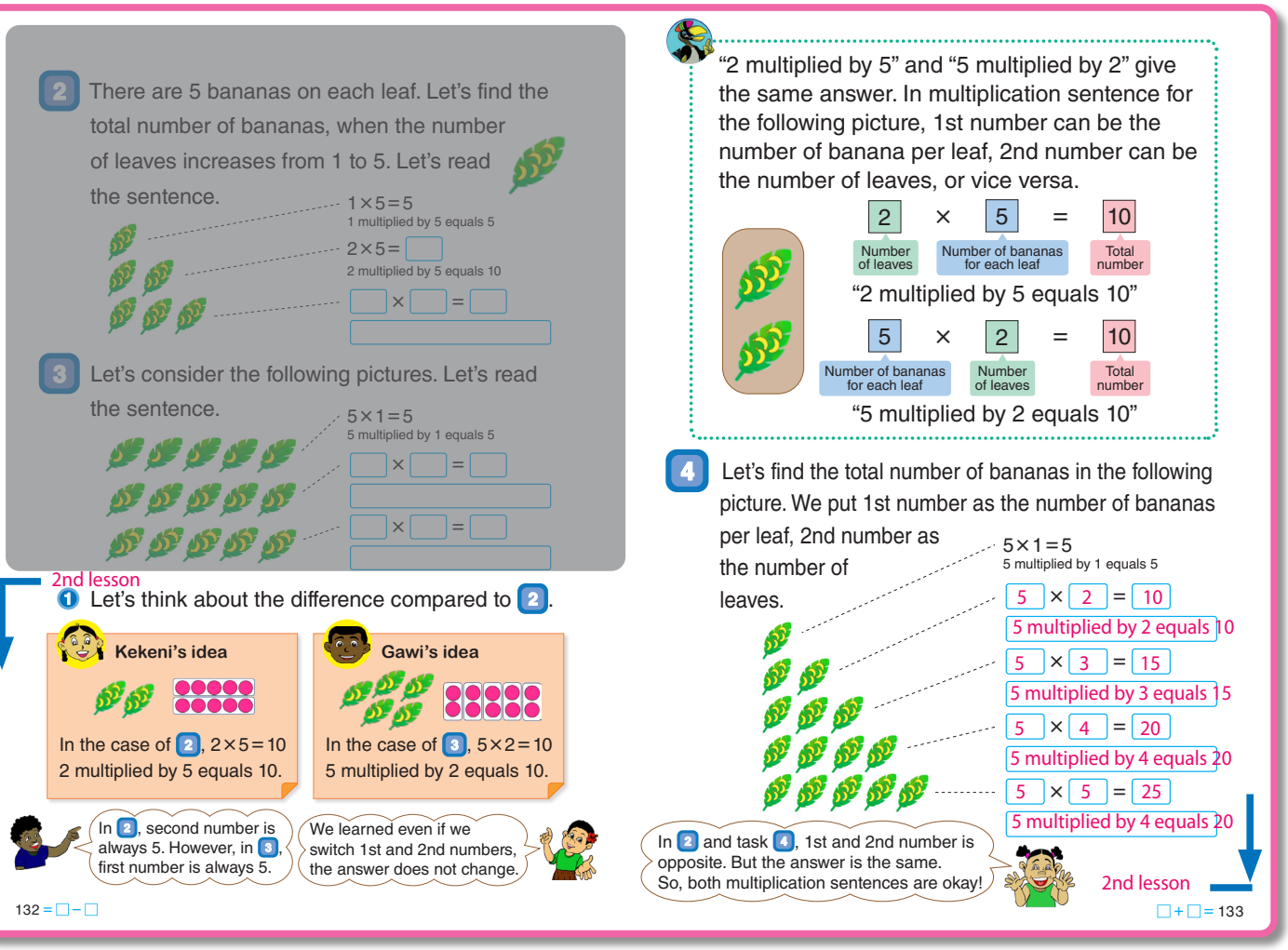
- Long tape for posting on the blackboard, rulers, mathematics blocks.

Assessment

- Make mathematics sentences using sets when dealing with consecutive numbers. F S

Teacher's Notes

In this lesson, the pupils will have the opportunity to deepen their understanding of the order of multiplication by using sets/groups to make multiplication sentences.
In doing so, they will be able to identify that the answer of 2 numbers can be expressed in two different ways.
For example; the multiplication sentence with the answer of 10 can be expressed as 2×5 or 5×2. However way the sets/groups are expressed, the answer is still the same.



Lesson Flow

INTRODUCTION

1 Review.

T/P Review key ideas from the previous lesson.

BODY

2 Introduce the main task.

T Introduce and explain the main task, "Let's understand the order of multiplication."

3 Think about and discuss the difference between the order of multiplication in 2 and 3.

T Ask the pupils to discuss the difference between the order of multiplication in task 2 and 3

P Expected responses:

- in task 2 the second number is always 5.
- in task 3 the first number is always.

T Advise the pupils to explain Kekeni and Gawi's ideas.

P Expected responses;

- Kekeni expresses her sentence as 2 sets of 5 which is 2 multiplied by 5 equals 10.
- Gawi expresses his idea as 5 sets of 2 which is 5 multiplied by 2 equals 10.
- Both math sentences have the same answer.

TN Emphasise that even if the first and second numbers are switched, the answer does not change.

4 Understand the important point.

T/P Read the important point in the .

T Explain the important point with emphasis on 2×5 and 5×2 as having the same answer of 10.

5 4 Introduce the order of multiplication for times table.

T Get the students to express the order of multiplication as the sets increase consecutively.

P Write multiplication sentences using the order of multiplication for the total number of bananas as the leaves (sets) increase while the bananas per leaf (objects) remain at 5.

TN The first number represents the number of bananas while the second number represents the leaves. This order of multiplication will be further utilised in learning the times tables.

T Remind students that even if the order of multiplication results in the numbers to be the opposite, the answer is still the same.

CONCLUSION

6 Summary.

T/P Summarise the lesson by confirming pupils understanding of the main ideas in the lesson.

Sample Blackboard Plan

Date: **Chapter 10**: Multiplication (1) **Sub-chapter 2:** The order for multiplication **Lesson** 2 of 2

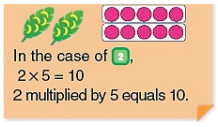
Main Task: "Let's understand the order of multiplication."

Review

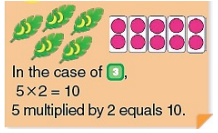
- Review key ideas with examples.
- A pair of numbers switched and multiplied gives the same answer..

Activities

3 What's the difference?



The second number is always 5.



The first number is always 5.

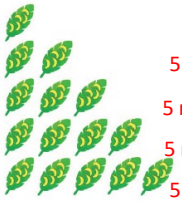
Even if the first and second numbers are switched, the answer is the same.



2 × 5 = 10
Number of leaves | Number of bananas in each leaf | Total number
"2 multiplied by 5 equals 10"

5 × 2 = 10
Number of bananas in each leaf | Number of leaves | Total number
"5 multiplied by 2 equals 10"

4 Find the total number of bananas



5×1=5
5 multiplied by 1 equals 5
5 × 2 = 10
5 multiplied by 2 equals 10
5 × 3 = 15
5 multiplied by 3 equals 15
5 × 4 = 20
5 multiplied by 4 equals 20
5 × 5 = 25
5 multiplied by 5 equals 25

Summary

In the order of multiplication, even if the first or second numbers are switched, the answer does not change.

End of Chapter Test: Chapter 10 **Date:**

Evaluation: Chapter 10 Multiplication (1)	Name:	Score /100

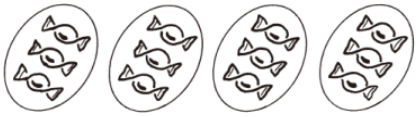
[10 points for math sentence and 10 points for answer]

1. How many candies are there? Write the multiplication math sentence and answer it.
   (1)



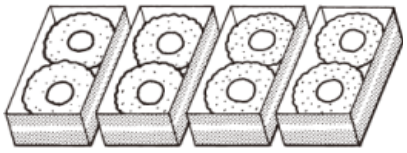
Math sentence: _____ Answer: _____

(2)



Math sentence: _____ Answer: _____

2. How many doughnuts are there? Write the multiplication math sentence and answer it.



Math sentence: _____ Answer: _____

3. There are 5 boats. Each can carry 2 people. How many people can be carried in total?

Math sentence: _____ Answer: _____

4. There are 4 tapes, each is 3 cm long. How long will the total length be?

Math sentence: _____ Answer: _____

Chapter 11 Multiplication (2)

1. Unit Objectives

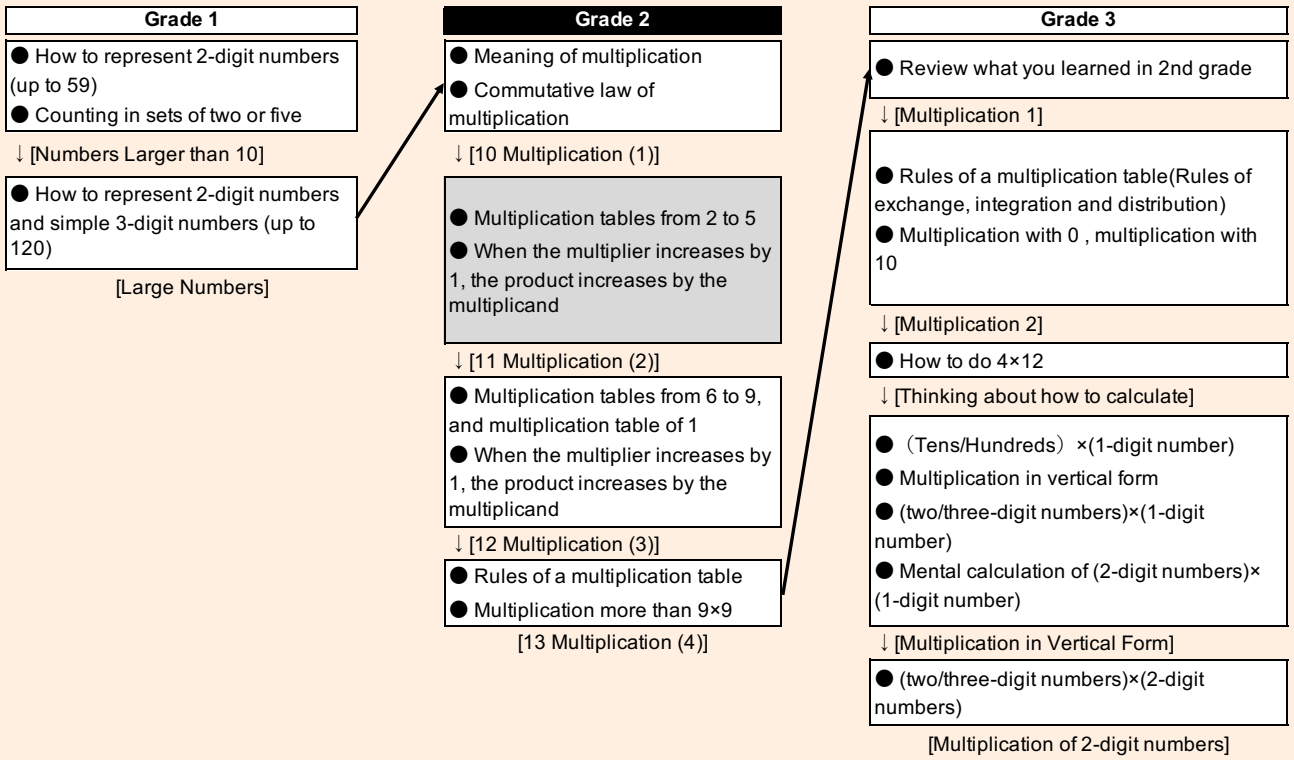
- To understand the meaning of multiplication and use the calculation.
- To get to know situations where multiplication is used.
- To explore simple properties which hold for multiplication, and to make use of them for making a multiplication table up to 9 times 9 and checking the results of calculations.
- To learn the multiplication table up to 9 times 9 and to multiply one-digit numbers accurately.
- To get to know situations where multiplication is used, and to understand the meaning of multiplication through activities of representing the situations with algebraic expressions or and interpreting the presented expressions.

2. Teaching Overview

In this unit, based on familiar examples, pupils will understand the structure of the multiplication tables from 2 to 5.
Also, let them discover the rule of multiplication that when the multiplier increases by 1, the product increases by the multiplicand, and deepen their understanding of the multiplication table.
Then, through a game using multiplication cards, master the multiplication table.

Key Concepts: Multiplication tables of 2 to 5 and rules.

3. Related Learning Contents



Unit 11

Unit: Multiplication (2)
Sub-unit: 1. The Multiplication Table of 2
Lesson 1 of 2

Textbook Page : p.134
Actual Lesson 092

Sub-unit Objectives

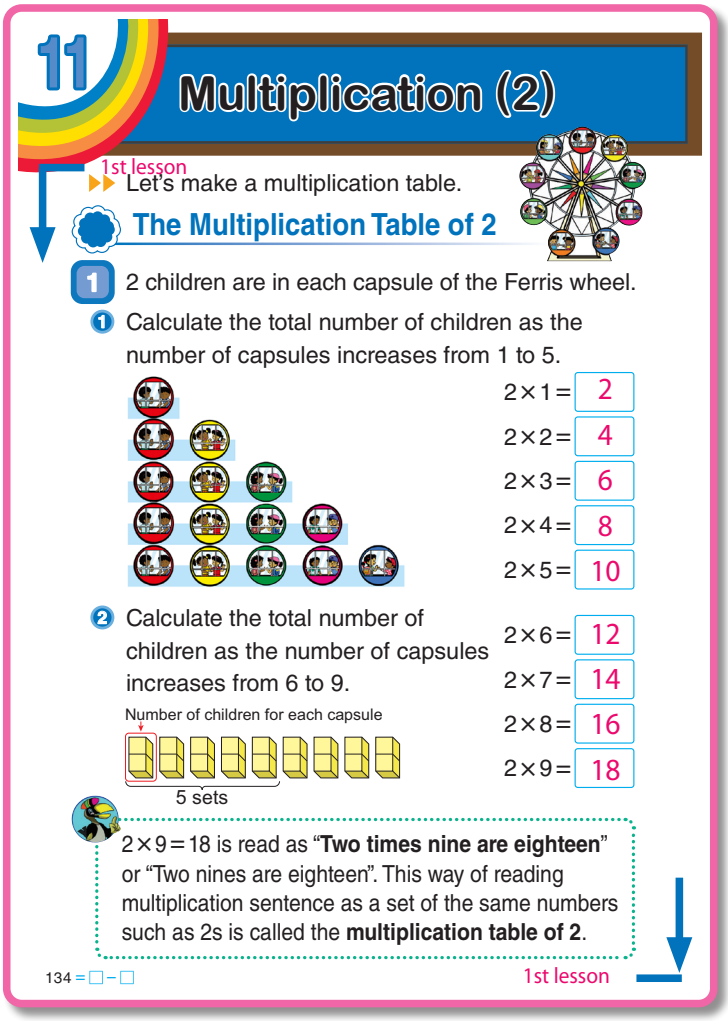
- To recognise situations and word problems of multiplication with the multiplier 2 and solve them to find the answers.
- To make a multiplication table of 2 and memorise it.
- To learn about the term “the multiplication table.

Lesson Objectives

- To solve the word problem for identifying the number of children in the Ferris wheel based on that of children in each capsule and the number of capsules ridden.
- To make the multiplication table of 2 through a problem-solving activity.

Prior Knowledge

- Sets of the same object.
- Repeated addition.



Preparation

- 9 sets of 2 blocks (sets of magnetic blocks for posting on the blackboard, and sets of blocks for pupils’ use), digital textbook software (if available).

Assessment

- Construct the multiplication table of 2 to demonstrate the understanding of the meaning of multiplication. F S

Teacher’s Notes

In this chapter, students are taught to become aware of situations where multiplication may be applied, and to understand the meaning and the method of calculation.
For example, students can understand multiplication as the operation to determine the total number when given the number in a group and the number of groups, or the amount that is so many times as many as the base amount. They can determine the product by repeated addition.
The multiplication table is taught, and it is important that students become proficient with multiplication of 1-digit numbers. Furthermore, to deepen their understanding of multiplication facts, students are taught simple cases of multiplication between 2-digit numbers and 1-digit numbers.

Lesson Flow

INTRODUCTION

1 **① Understand the situation.**

T/P Read and understand the situation and picture of the Ferris wheel and allow pupils to freely discuss what they notice.

P Describe what they observe from the pictures about number of capsules and the number of people in each capsule.

BODY

2 **Introduce the main task.**

T Introduce and explain the Main task, "Let's make the multiplication table of 2".

3 **① Calculate the total number of children when the number of capsules is 1, 2, 3, 4 or 5.**

T Let pupils think about how to calculate the total number of children in the Ferris wheel when the number of capsules is 1, 2, 3, 4 or 5.

P Present their ideas of how to find the number of children using multiplication.

TN Encourage pupils to calculate the total number of children in various ways.

P Think about and find the number of children by; Count one by one. /Count by 2s. /Calculate by repeated addition.

4 **② Calculate the total number of children when the number of capsules is 6, 7, 8 or 9.**

T Let the pupils think about how to calculate the total number of children in the Ferris wheel when the number of capsules is 6, 7, 8, 9 or 10.

P Think about and calculate the number of children for each case when the number of capsules is 6, 7, 8, or 9.

T/P Check and confirm the answers.

TN Pupils should realise and understand that the numbers increase by 2s. When the number of capsules increases by 1s, the number of children increases by 2s.

T/P Read and learn about the term "multiplication table" in the ⬚.

TN Emphasise and explain the important point.

CONCLUSION

5 **Summary.**

T/P Summarise the lesson by confirming pupils understanding of the main ideas in the lesson.

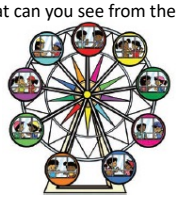
Sample Blackboard Plan

Date: **Chapter 11**: Multiplication (2) **Sub-chapter 1:** The Multiplication Table of 2 **Lesson** 1 of 2

Main Task: "Let's make the multiplication table of 2."

Introduction

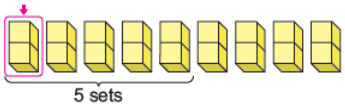
What can you see from the picture?



Activities

1 ① Calculate the total number of children as the capsule increases from 1 to 5.

2×1= 2
2×2= 4
2×3= 6
2×4= 8
2×5= 10



② Calculate the total number of children as the capsule increases from 6 to 9.

2×6= 12
2×7= 14
2×8= 16
2×9= 18

2x9=18 is read as "Two times nine equals eighteen" or "Two nines are eighteen."
This way of reading multiplication sentence as a set of the same numbers such as 2's is called multiplication table of 2

Summary

In the multiplication table of 2, when the sets of 2 increase by 1, the total increases by 2

Unit 11

Unit: Multiplication (2)
Sub-unit: 1. The Multiplication Table of 2
Lesson 2 of 2

Textbook Page : p.135
Actual Lesson 093

Lesson Objectives

- To learn about how to recite the multiplication table of 2 and practice.
- To make a math story that uses the multiplication table of 2.

Prior Knowledge

- Meaning of multiplication
- Sets of the same object

Preparation

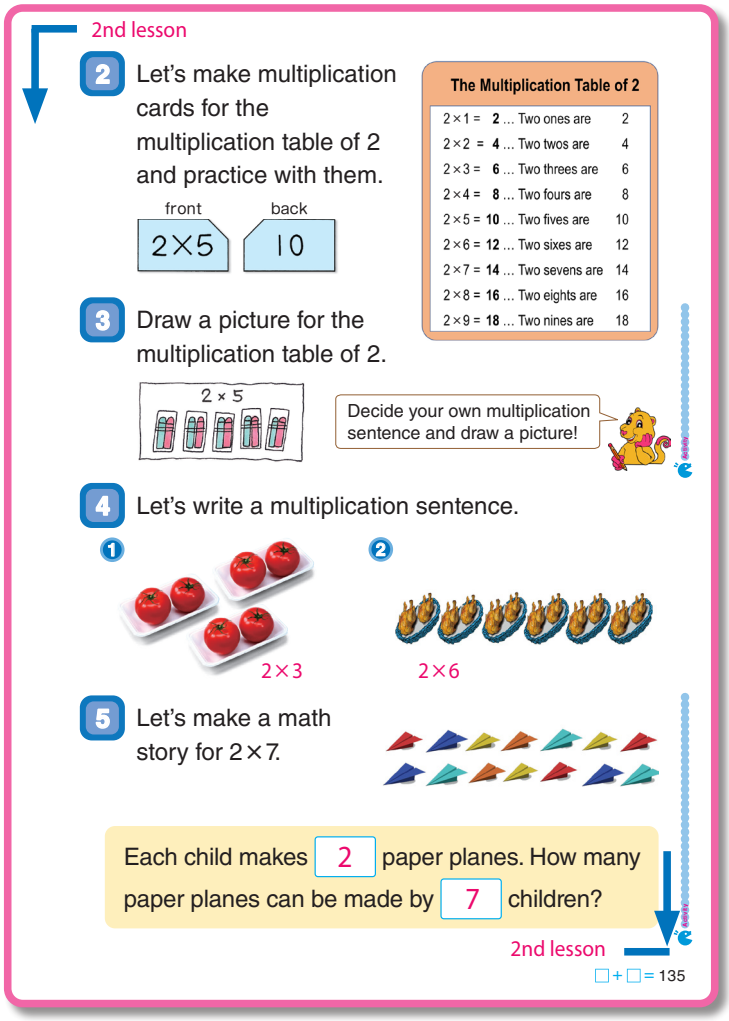
- Cardboard, drawing paper, multiplication table of 2, digital textbook software (if available).

Assessment

- Recite the multiplication table of 2 confidently. F S
- Make a math story that uses the multiplication table of 2. F S

Teacher's Notes

How to Make the Multiplication Table Cards
When making the multiplication table cards as shown in the textbook, pupils are supposed to write 2×5 in the front and 10 at the back.
Teacher should be careful with the size of the numbers are not too small to recognise. In order to deliver the lesson smoothly, Teacher can print out the paper with the frames prior to the lesson so that pupils can just simply cut out the cards along the lines during the lesson.
Teacher can put a line on right top of each frame so that pupils can easily recognise that each frame needs to be cut off.



Lesson Flow

INTRODUCTION

1 Review

T/P Review key ideas learnt in the previous lesson.

2 Introduce the main task.

T Introduce and explain the main task 'Let's practice using the multiplication table of 2'

BODY

3 Recite the multiplication table of 2

T Guide the pupils to learn about how to recite the multiplication table of 2.

P Follow Teacher's demonstration and recite the multiplication table of 2 starting from 2×1.

TN It can be practiced in various ways. Teacher can tell pupils the beginning part "two nines is…" and let pupils say "18".
Teacher can also have them practice in pairs.

P Practice many times until they can recite it properly regardless of the order.

Lesson Flow

4 **2 Make a set of cards for the multiplication table of 2.**

T Get the pupils to make a set of cards for the multiplication table of 2, and memorise it.

P Write on cardboard the multiplication table of 2.
Example: Front: 2×5 (Expression)
Back: 10 (Answer)

P Practice saying the answers at the back from the expressions in the front of the cards.

T Get the pupils to use the cards they made and practice telling the answers at the back from the expressions in the front.

P Practice the 2 times table using the cards.

TN Tell the pupils to separate the cards they answered wrong from the ones they answered correct, and practice the ones they couldn't answer correctly.

5 **3 Draw a picture representing the multiplication table of 2.**

T Ask students to draw different pictures to represent multiplication table of 2.

P Draw a picture for the multiplication table of 2.

TN When they finish drawing, share their work in pair or in groups to check the expressions and the answers.

6 **4 Write a mathematical sentence for the multiplication table of 2.**

T "Let's write a multiplication sentence for pictures ① and ②."

P Look at the pictures and recognise how many tomatoes/pencils in each pack/box and for how many packs/boxes.

P Find the answers by using the multiplication table of 2.

7 **5 Make a math story that uses the multiplication table of 2.**

T Let's make a math story for 2×7.

P Fill the boxes ☐ with numbers and solve the problem.

TN For practice, pupils can change the number from the original 7 to other numbers and make different math stories using the multiplication table of 2. Pupils can also practice drawing pictures of the math story as they did in problem 3 and solving the problem.

P Present the problems they made with the answer.

CONCLUSION

8 **Summary.**

T/P Summarise the lesson by confirming students' understanding of the main ideas of the lesson.

Sample Blackboard Plan

Date: **Chapter 11**: Multiplication (2) **Sub-chapter 1:** The Multiplication Table of 2 **Lesson** 2 of 2

Main Task: "Let's practice using the multiplication table of 2"

Review

- Review key idea with examples.
- In the multiplication table of 2, when the sets of 2 increase by 1, the total increases by 2.

Activities

Recite the multiplication table of 2.

The Multiplication Table of 2

2 x 1 =	2	... Two ones are	2
2 x 2 =	4	... Two twos are	4
2 x 3 =	6	... Two threes are	6
2 x 4 =	8	... Two fours are	8
2 x 5 =	10	... Two fives are	10
2 x 6 =	12	... Two sixes are	12
2 x 7 =	14	... Two sevens are	14
2 x 8 =	16	... Two eights are	16
2 x 9 =	18	... Two nines are	18

2 Make a set of cards for the multiplication table of 2.

front 2×5 back 10

3 Draw a picture for the multiplication table of 2..



4 Write a multiplication sentence for the following;



2 x 3 = 6



2 x 6 = 12

5 Make a math story for 2 x 7.



Each child makes __2__ paper planes. How many paper planes can be made by __7__ children?
Answer: 14 planes

Summary

We can use the multiplication table of 2 to write multiplication sentences, draw pictures and make math stories.

Unit 11

Unit: Multiplication (2)
Sub-unit: 2. The Multiplication Table of 5
Lesson 1 of 2

Textbook Page : p.136
Actual Lesson 094

Sub-unit Objectives

- To recognise situations and word problems of multiplication with the multiplier 5 and solve them to find the answers.
- To make a multiplication table of 5 and memorise it.

Lesson Objectives

- To solve the word problem for identifying the total number of meatpies on the plates based on the number of meatpies on each plate and that of the dishes.
- To make the multiplication table of 5 through this problem-solving activity.

Prior Knowledge

- Meaning of multiplication.
- Sets of the same objects.

Preparation

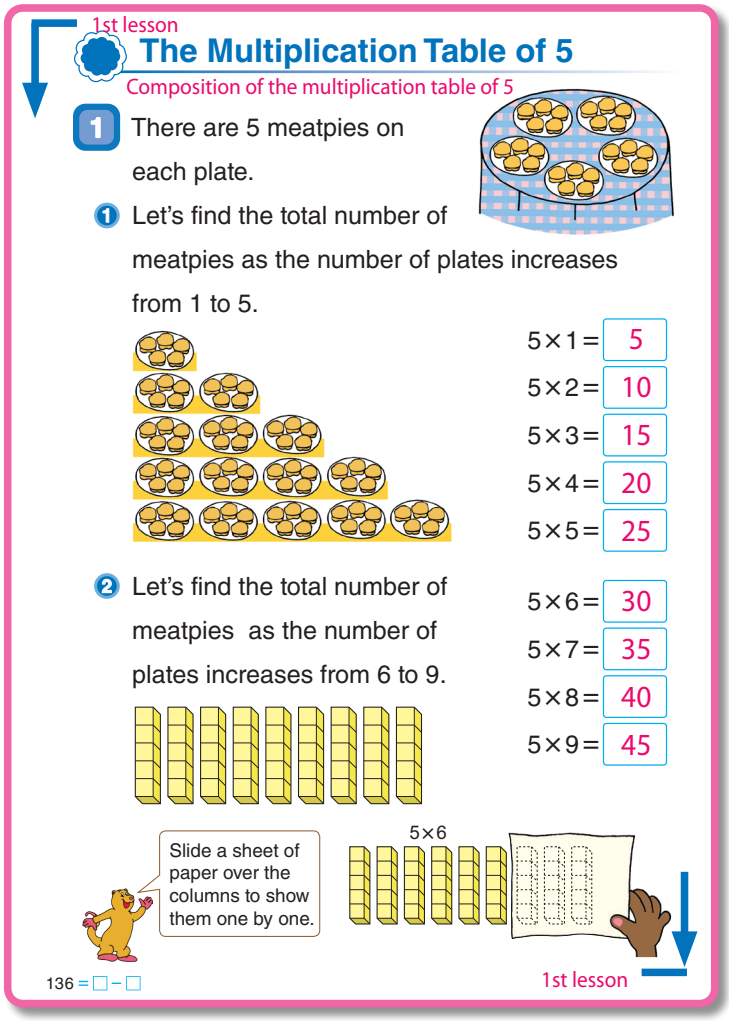
- 9 sets of 5 blocks (sets of magnetic blocks for posting on the blackboard, sets of blocks for pupils' use, digital textbook software (if available).
- Sets of cards for students to make their multiplication table of 5.

Assessment

- Construct the multiplication table of 5 to demonstrate the understanding of the meaning of multiplication. F S

Teacher's Notes

In this lesson, the multiplication table of 5 is taught, and it is important that students become proficient with multiplication of 1-digit numbers.
Furthermore, to deepen their understanding of multiplication facts, students are taught simple cases of multiplication between 2-digit numbers and 1-digit numbers.



Lesson Flow

INTRODUCTION

1 Review.

T/P Review key ideas learnt in the previous lesson.

2 Introduce the main task.

T Introduce and explain the main task 'Let's make the multiplication table of 5'.

BODY

3 1 Understand the given situation on multiplying by 5.

T/P Read and understand the situation together.

P 1 Think about how to find the total number of meatpies as the number of plate increases

TN When one plates has 5 meatpies each, pupils find out the total number of meatpies as the number of dishes increase from 1, 2, 3, 4, to 5.

Lesson Flow

P Realise that the number of cookies can be represented in multiplication as 5×1 for 1 dish, 5×2 for 2 plates, 5×3 for 3 dishes.

P Recall the learning in the previous lesson on the multiplication table of 2 and apply it in finding the number of meatpies.

- Count one by one.
- Count by 5s. 5, 10, 15, 20, 25
- Calculate in repeated addition. 5×2=5+5.
- When the number of dishes increase by 1s, the total number of meatpies increases by 5s.

5×2=5+5=10 5×3=10+5=15
5×4=15+5=20 5×5=20+5=25

T/P Present and discuss how they found out the number of meatpies.

4 Find the total number of cookies when the number of dishes is 6, 7, 8 or 9.

T/P ② Discuss how to find the total number of meatpies using blocks and multiplication table of 5.

P Using the solutions they found out with 1 plates – 5 dishes, pupils think for each case when the number of dishes is 6, 7, 8, or 9.

T/P Check the answers with pupils.
5×6=30 5×7=35
5×8=40 5×9=45

TN To visualise the scenes of 6, 7, 8 or 9 dishes, cover the columns of blocks with a sheet of paper and show them one by one.

T Invite students to present their findings to class.

P Present anything they noticed; 1) the numbers increase by 5s; 2) when the number of dishes decreases by 1s, the number of cookies decreases by 5s, 3) when a multiplicand increases by 1, a product increases by 5 or when a multiplicand decreases by 1, a product decreases by 5, etc.

CONCLUSION

5 Summary.

T/P Summarise the lesson by confirming students' understanding of the main ideas of the lesson.

Sample Blackboard Plan

Date: **Chapter 11**: Multiplication (2) **Sub-chapter 2:** The Multiplication Table of 5 **Lesson** 1 of 2

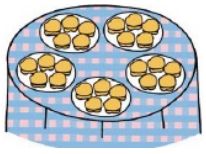
Main Task: "Let's make the multiplication table of 5."

Introduction

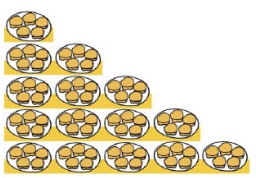
- Review key idea with examples.
- We can use the multiplication table of 2 to write multiplication sentences, draw pictures and make math stories.

Activities

1 What can you see from the picture?

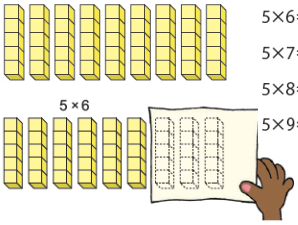


1 Find the total number of meat pies as the number of plates increases from 1 to 5.



5×1= 5
5×2= 10
5×3= 15
5×4= 20
5×5= 25

② Find the total number of meat pies as the plates increase from 6 to 9.



5×6= 30
5×7= 35
5×8= 40
5×9= 45

Summary

-In the multiplication table of 5, when the sets of 5 increase by 1, the total increases by 5.

Unit 11

Unit: Multiplication (2)
Sub-unit: 2. The Multiplication Table of 5
Lesson 2 of 2

Textbook Page : p.137
Actual Lesson 095

Lesson Objectives

- To learn about how to recite the multiplication table of 5 and practice.
- To make a math story that uses the multiplication table of 5.

Prior Knowledge

- Meaning of multiplication
- Multiplication table of 2

Preparation

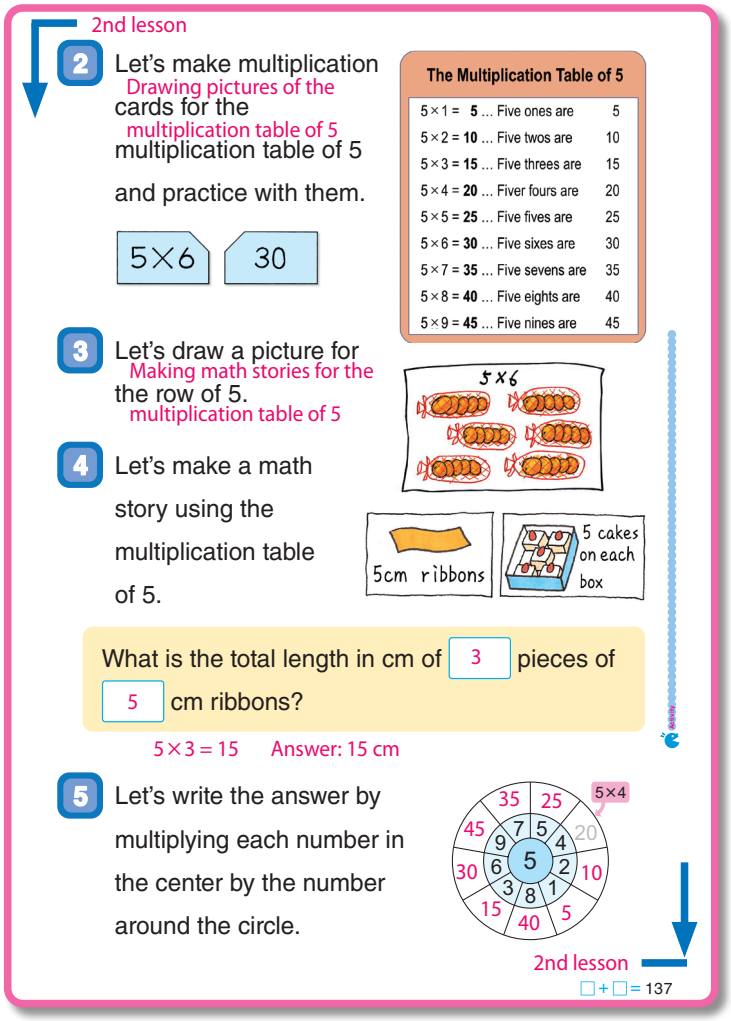
- Cardboard, drawing paper, multiplication table of 5, digital textbook software (if available).

Assessment

- Recite the multiplication table of 5 confidently. F S
- Make a math story that uses the multiplication table of 5. F S

Teacher's Notes

How to Make the Multiplication Table Cards
When making the multiplication table cards as shown in the textbook, pupils are supposed to write 5×6 in the front and 30 at the back.
Teacher should be careful with the size of a card because letters would be too small to recognise. In order to deliver the lesson smoothly,
From this example pupils can write cards for 5×1 to 5×9.



Lesson Flow

INTRODUCTION

1 Review.
T/P Review key ideas learnt in the previous lesson.

2 Introduce the main task.
T Introduce and explain the main task 'Let's practice using the multiplication table of 5'.

BODY

3 Recite the multiplication table of 5.
T Put up the chart of multiplication table of 5 and demonstrate how to recite the table.
P Follow Teacher's demonstration and recite the multiplication table of 5 starting from 5×1.
TN Pupils should practice many times until they can recite it properly regardless of the order.

4 2 Make a set of cards for multiplication table of 5.
T Provide pupils with a set of blank cards.
P Write the multiplication table of 5 on cardboard and use the cards to practice

telling the answers at the back from the expressions in the front.

T Guide pupils to separate the cards they answered wrong from the ones they answered correct, and allow them to practice the ones they couldn't answer correctly.

5 3 Draw a picture that represents the multiplication table of 5.

T Guide the pupils to describe and draw the scenes in a picture to which the multiplication table of 5 is applied.

P Think about and draw a picture for the multiplication table of 5.

TN When they finish drawing, they should share their work in pairs or in groups and check the expressions and the answers.

6 4 Make a math story that uses the multiplication table of 5.

T Introduce the problem.

P Make a math story that uses the multiplication table of 5 and discuss the story with their friends to find the answers.

P Fill the boxes □ with numbers and solve the problem.

P Look at the picture of 5 pieces of cakes in a box, make a math story and solve the problem they made.

T Invite pupils to present their math stories and check the expressions and answers with the class.

7 5 Practice the multiplication table of 5.

T/P Based on the circle-shaped chart, pupils multiply the number shown in the middle (5) by each respective number around it (i.e. 5, 4, 2, 1…). While reciting the multiplication table of 5, pupils write each multiplication answer in the chart.

CONCLUSION

8 Summary.

T/P Summarise the lesson by confirming students' understanding of the main ideas of the lesson.

Sample Blackboard Plan

Date: **Chapter 11**: Multiplication (2) **Sub-chapter 2:** The Multiplication Table of 5 **Lesson** 2 of 2

Main Task: "Let's practice using multiplication table of 5"

Review

- Review key idea with examples.
- in the multiplication table of 5, when the sets of 5 increase by 1, the total increases by 5.

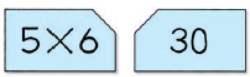
Activities

Recite the multiplication table of 5.

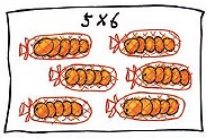
The Multiplication Table of 5

5 x 1 = **5** ... Five ones are	5
5 x 2 = **10** ... Five twos are	10
5 x 3 = **15** ... Five threes are	15
5 x 4 = **20** ... Fiver fours are	20
5 x 5 = **25** ... Five fives are	25
5 x 6 = **30** ... Five sixes are	30
5 x 7 = **35** ... Five sevens are	35
5 x 8 = **40** ... Five eights are	40
5 x 9 = **45** ... Five nines are	45

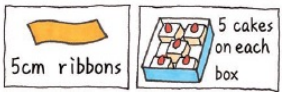
2 Make a set of cards for the multiplication table of 5.



3 Draw a picture for the multiplication table of 5.

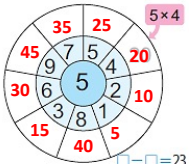


4 Make a math story using multiplication table of 5;



What is the total length in cm of 5 pieces of 5 cm ribbons?
Answer: 25 cm

5 Find the answers to complete the circle.



Summary

We can use the multiplication table of 5 to write multiplication sentences, draw pictures and make math stories.

Unit 11

Unit: Multiplication (2)
Sub-unit: 2. The Multiplication Table of 3
Lesson 1 of 2

Textbook Page : p.138
Actual Lesson 096

Sub-unit Objectives

- To recognise situations and word problems of multiplication with the multiplier 3 and solve them to find the answers.
- To make a multiplication table of 3 and memorise it.

Lesson Objectives

- To identify situation of tricycles as word problems of multiplication and solve them to find the answers.
- To make the multiplication table of 3 through this problem-solving activity.
- To show that in the multiplication table of 3, the numbers increase by 3s.

Prior Knowledge

- Meaning of multiplication
- Sets of the same object
- Multiplication Table of 2 and 5.

Preparation

- 9 sets of 3 blocks (sets of magnetic blocks for posting on the blackboard), sets of blocks for pupils' use, digital textbook software (if available).

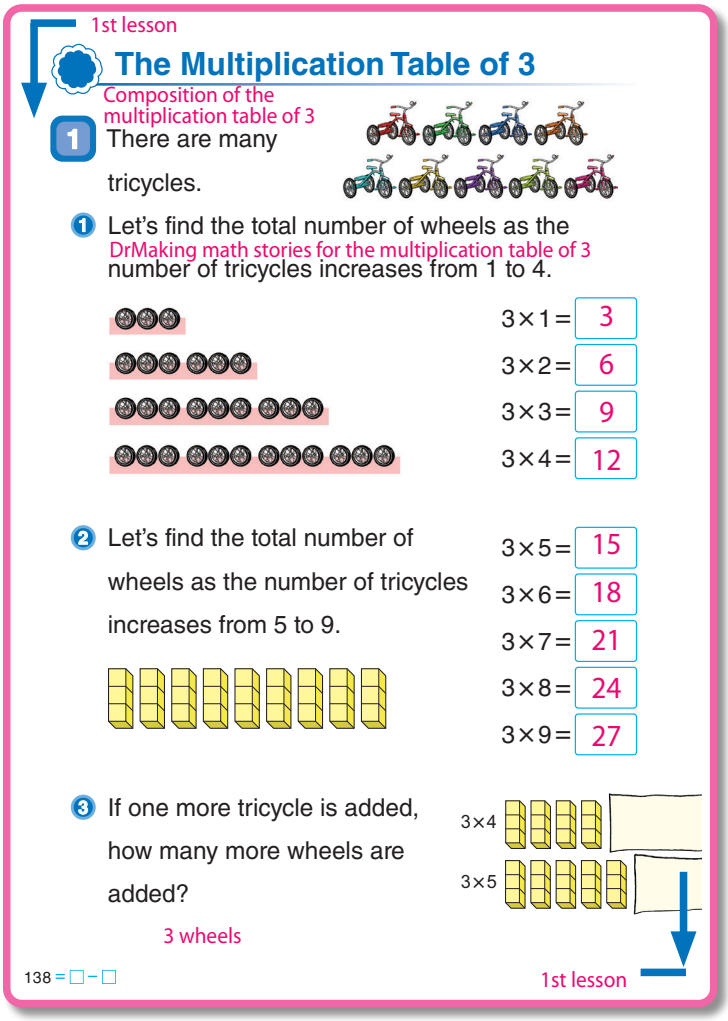
Assessment

- Construct the multiplication table of 3 to demonstrate the understanding of the meaning of multiplication. F S

Teacher's Notes

Lessons on the Composition of the Multiplication Table

As the lessons proceed for the learning of the multiplication tables of 2, 5, 3…, pupils' interests to be placed more on reciting and memorizing the multiplication table than on understanding the composition of the table. Teacher also tends to focus on how properly pupils are reciting and memorising, which achieves only superficial teaching and learning. In order to actualise minds-on learning, Teacher has to try to develop such lessons that have pupils think and facilitate meaningful problem-solving related to the composition of the multiplication table.



Lesson Flow

INTRODUCTION

1 Review.

T/P Review key ideas learnt in the previous lesson.

2 Introduce the main task.

T Introduce and explain the main task, 'Let's make the multiplication table of 3'.

BODY

3 ① Understand the given situation on multiplying by 3.

T/P Read and understand the situation together.

P Think about how to find the total number of wheels as the number of tricycles increases.

T/P Discuss how to find the total number of wheels.

4 Find out the total number of wheels when the number of tricycles increases from 1, 2, 3, and 4.

T ① When one tricycle has 3 wheels, find out the total number of wheels as the number of tricycles increases from 1, 2, 3, and 4.

P Identify that each tricycle has 3 wheels and think about the total number of wheels based on the number of tricycles.

TN Advise pupils to follow the same concept of the multiplication of 2 and 5.

P Possible response:

- Count one by one.
- Calculate the repeated addition. $3\times3=3+3+3$
- When the number of tricycles increases by 1s, the total number of wheels increases by 3s.
  $3\times2=3+3=6$ $3\times3=6+3=9$
  $3\times4=9+3=12$

T Ask students to present their ideas

P Present how they found out the number of wheels.

5 Find out the total number of wheels when the number of tricycles is 5, 6, 7, 8 and 9.

T ② Ask pupils to find the number of wheels when the number of tricycles is 5, 6, 7, 8 or 9.

P Find the total number of wheels by applying the ideas used for 1−4 tricycles in the previous activity.

T ③ Ask students about what happens when another tricycle is added.

P Realise that when the number of tricycles increases every time, the number of wheels increases by 3.

TN Remind pupils to utilise block diagrams if they have difficulties.

CONCLUSION

6 Summary.

T/P Summarise the lesson by confirming students' understanding of the main ideas of the lesson

Sample Blackboard Plan

Date: **Chapter 11**: Multiplication (2) **Sub-chapter 3:** The Multiplication Table of 3 **Lesson** 1 of 2

Main Task: "Let's make the multiplication table of 3."

Introduction

- Review key idea with examples.
- We can use the multiplication table of 5 to write multiplication sentences, draw pictures, make math stories and solve problems.

Activities

1 What can you see from the picture?



1 Find the total number of wheels as the number of tricycles increases from 1 to 4.



$3\times1=3$
$3\times2=6$
$3\times3=9$
$3\times4=12$

2 Find the total number of wheels as the tricycles increase from 5 to 9.



$3\times5=15$
$3\times6=18$
$3\times7=21$
$3\times8=24$
$3\times9=27$

3 If one more tricycle is added, how many more wheels are added?
Answer: 3 wheels

Summary

-In the multiplication table of 3, when the sets of 3 increase by 1, the total increases by 3.

Unit 11

Unit: Multiplication (2)
Sub-unit: 3. The Multiplication Table of 3
Lesson 2 of 2

Textbook Page : p.139
Actual Lesson 097

Lesson Objectives

- To recite the multiplication table of 3.
- To make a math story that uses the multiplication table of 3.

Prior Knowledge

- Meaning of multiplication.
- Sets of the same object.
- Multiplication table of 2 and 5.

Preparation

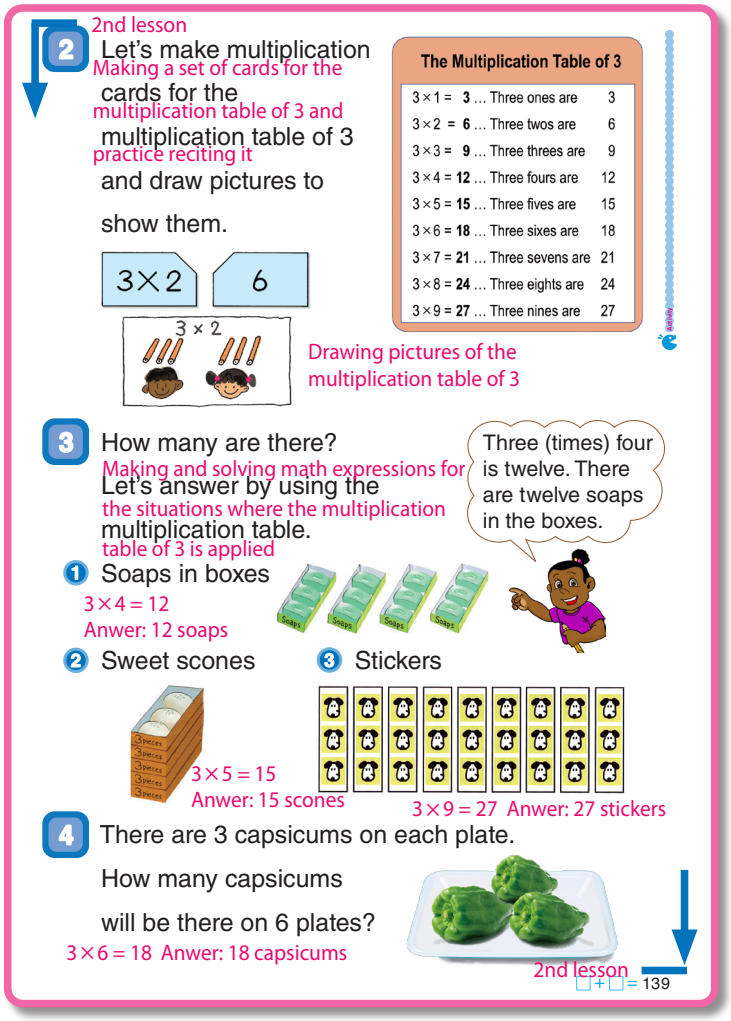
- Cardboard, drawing paper, multiplication table of 3, digital textbook software (if available).

Assessment

- Recite the multiplication table of 3 confidently. F S
- Make a math story that uses the multiplication table of 3. F S

Teacher's Notes

Teaching Tips: Ways to Practice Reciting
When pupils practice reciting the multiplication table, Teacher should ensure that they are not just saying the numbers in a rhythmic pace but linking them with the multiplication expressions. While pupils should repeatedly practice until they can say the numbers almost automatically, it is important that what they are memorising can be embedded in their minds with certain meanings so that it can be used practically in calculation activities.



Lesson Flow

INTRODUCTION

1 Review

T/P Review key ideas learnt in the previous lesson.

2 Introduce the main task.

T Introduce and explain the main task 'Let's practice using the multiplication table of 3'.

BODY

3 Recite the multiplication table of 3.

T demonstrate and recite the multiplication table of 3 starting from 3×1.

P Follow Teacher's demonstration and practice many times until it is recited correctly regardless of the order.

4 2 Make a set of cards for the multiplication table of 3.

T "Let's make a set of cards for the multiplication table of 3"

P Make cards for the multiplication table of 3.

TN Guide the pupils to use the cards.

P Use the cards to practice telling the answers at the back from the expressions in the front.

T Inform pupils to separate the cards they answered wrong from the ones they answered correct, and allow them to practice the ones they couldn't answer correctly.

5 Draw a picture that represents the multiplication table of 3.

T Ask students to draw different pictures to represent multiplication table of 3.

P Draw a picture for the multiplication table of 3 share the work in pairs or in groups to check the expressions and the answers.

6 3 How many are there?

T How many bars of soap are there?

P 1 Find out the total number of bars of soap in the picture using the multiplication table of 3.

T Tell students to solve for 1 and 2.

P Find out the total number of pieces of sweet scones and the pieces of stickers in the pictures using the multiplication table of 3.

3×5=15 Answer 15 pieces of sweet scones

3×9=27 Answer 27 pieces of stickers

T/P 4 Read the problem and find out the number of capsicums.

P 3×6=18 Answer 18 capsicums.

TN Pupils cannot use the picture as it only shows 1 pack of capsicums and not 6 packs. Pupils therefore have to use the multiplication table.

CONCLUSION

7 Summary.

T/P Summarise the lesson by confirming students' understanding of the main ideas of the lesson.

Sample Blackboard Plan

Date: **Chapter 11**: Multiplication (2) **Sub-chapter 3:** The Multiplication Table of 3 **Lesson** 2 of 2

Main Task: "Let's practice using the multiplication table of 3"

Review

- Review key idea with examples.
- in the multiplication table of 3, when the sets of 3 increase by 1, the total increases by 3.

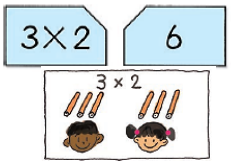
Activities

Recite the multiplication table of 3.

The Multiplication Table of 3

3 x 1 = 3	... Three ones are	3
3 x 2 = 6	... Three twos are	6
3 x 3 = 9	... Three threes are	9
3 x 4 = 12	... Three fours are	12
3 x 5 = 15	... Three fives are	15
3 x 6 = 18	... Three sixes are	18
3 x 7 = 21	... Three sevens are	21
3 x 8 = 24	... Three eights are	24
3 x 9 = 27	... Three nines are	27

2 Make a set of cards for the multiplication table of 3 and draw pictures.



3 How many are there?

1 

Answer: 3 x 4 = 12 bars of soap

2 

Answer: 3 x 5 = 12 scones

3 

Answer: 3 x 9 = 27 stickers

4 There are 3 capsicums in a pack. How many will be there in 6 packs?



Answer: 3 x 6 = 18 capsicums

Summary

We can use the multiplication table of 3 to write multiplication sentences, draw pictures and solve problems.

Unit 11

Unit: Multiplication (2)
Sub-unit: 4. The Multiplication Table of 4
Lesson 1 of 2

Textbook Page : p.140
Actual Lesson 098

Sub-unit Objectives

- To recognise situations and word problems of multiplication with the multiplier 4 and solve them to find the answers.
- To make a multiplication table of 4 and memorise it.

Lesson Objectives

- To recognise the meaning of the numeral '3'
- To read and write numeral '3'.

Prior Knowledge

- Meaning of multiplication.
- Sets of the same object.
- Multiplication table of 2, 5 and 3.

Preparation

- 9 sets of 4 blocks (sets of magnetic blocks for posting on the blackboard), sets of blocks for pupils' use, digital textbook software (if available)

Assessment

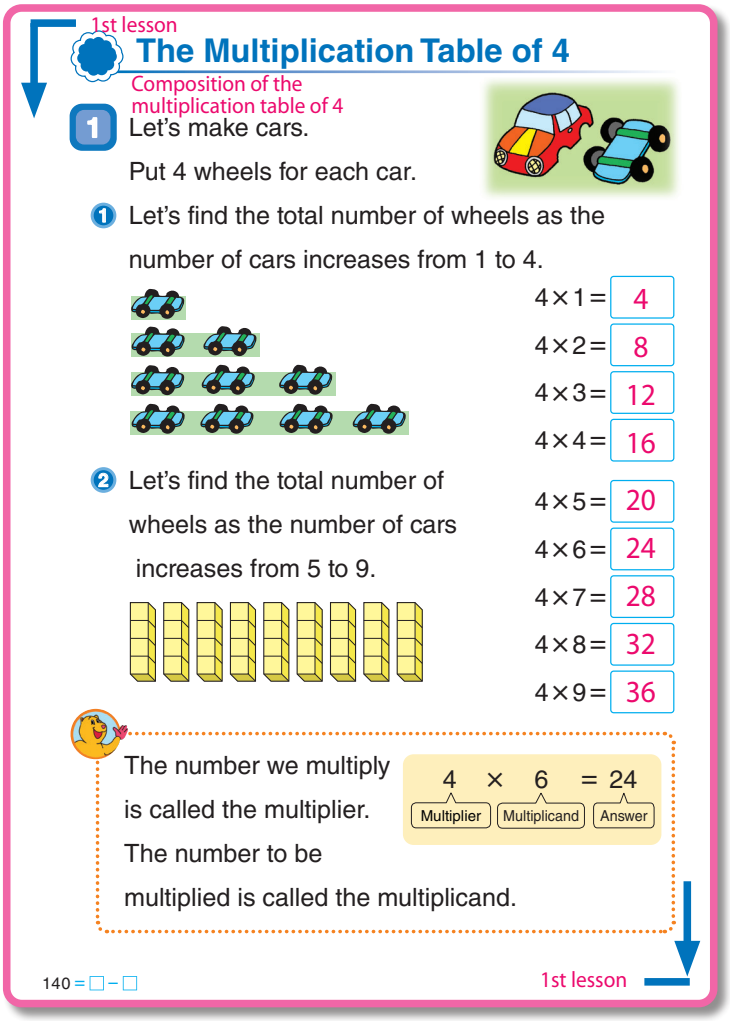
- Construct the multiplication table of 3 to demonstrate the understanding of the meaning of multiplication. F S

Teacher's Notes

Challenges in Understanding the Composition of the Multiplication Table and Possible Measures.

While pupils are trying to memorise and recite the multiplication table, there are pupils who face difficulties in correctly memorising it as they do not have full understanding of the composition of the table. For such pupils, Teacher can provide follow up explanations that when the multiplier increases by 1, the answer increases by 4, thus adding 4 to the answer of the previous multiplication.

4×2 is 4+4=8, 4×3 is 4+4+4=12, etc.



Lesson Flow

INTRODUCTION

1 Review.

T/P Review key ideas learnt in the previous lesson.

2 Introduce the main task.

T Introduce and explain the main task 'Let's make the multiplication table of 4'.

BODY

3 ① Understand the given situation on multiplying by 4.

T/P Read and understand the situation together

P Think about how to find the total number of wheels as the number of cars increases.

T/P Discuss how to find the total number of wheels.

4 ① Find out the total number of wheels when the number of cars increases from 1, 2, 3, and 4.

T Let's find the total number of wheels as the number of cars increases.

P Show that each car has 4 wheels and think about the total number of wheels based on the number of cars.

P Possible Response:

- Count one by one.
- Calculate the repeated addition.
- When the number of cars increases by 1s, the total number of wheels increases by 4s.

T Ask students to present their ideas

P Present how they found out the number of wheels.

5 ② Find out the total number of wheels when the number of tricycles is 5, 6, 7, 8 and 9.

T Ask pupils to find out the total number of wheels when the number of cars is 5, 6, 7, 8 or 9.

P Find the number of wheels using the same idea used for, 2, 3, and 4.

T/P Check the expressions and answers.

T/P Read the important point in the .

T Explain the terms "multiplier", "multiplicand", and "answer".

CONCLUSION

6 Summary.

T/P Summarise the lesson by confirming students' understanding of the main ideas of the lesson.

Sample Blackboard Plan

Date: **Chapter 11**: Multiplication (2) **Sub-chapter 4:** The Multiplication Table of 4 **Lesson** 1 of 2

Main Task: "Let's make the multiplication table of 4."

Introduction

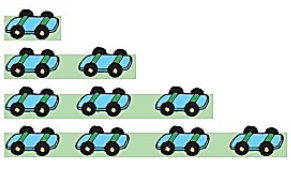
- Review key idea with examples.
- We can use the multiplication table of 3 to write multiplication sentences, draw pictures and solve problems..

Activities

1 What can you see from the picture?



1 Find the total number of wheels as the number of cars increases from 1 to 4.

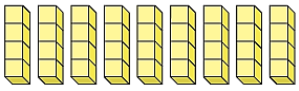


4×1= 4
4×2= 8
4×3= 12
4×4= 16

4 × 6 = 24
Multiplier Multiplicand Answer

The number we multiply is the ***multiplier***. The number to be multiplied is the ***multiplicand***.

2 Find the total number of wheels as the cars increase from 5 to 9.



4×5= 20
4×6= 24
4×7= 28
4×8= 32
4×9= 36

Summary

-The number we multiply is the ***multiplier***. The number to be multiplied is the ***multiplicand***.

Unit 11

Unit: Multiplication (2)
Sub-unit: 4. The Multiplication Table of 4
Lesson 2 of 2

Textbook Page : p.141
Actual Lesson 099

Lesson Objectives

- To recite the multiplication table of 4 and practice.
- To make a math story that uses the multiplication table of 4.

Prior Knowledge

- Meaning of multiplication
- Sets of the same object
- Multiplication table of 2, 5 and 3

Preparation

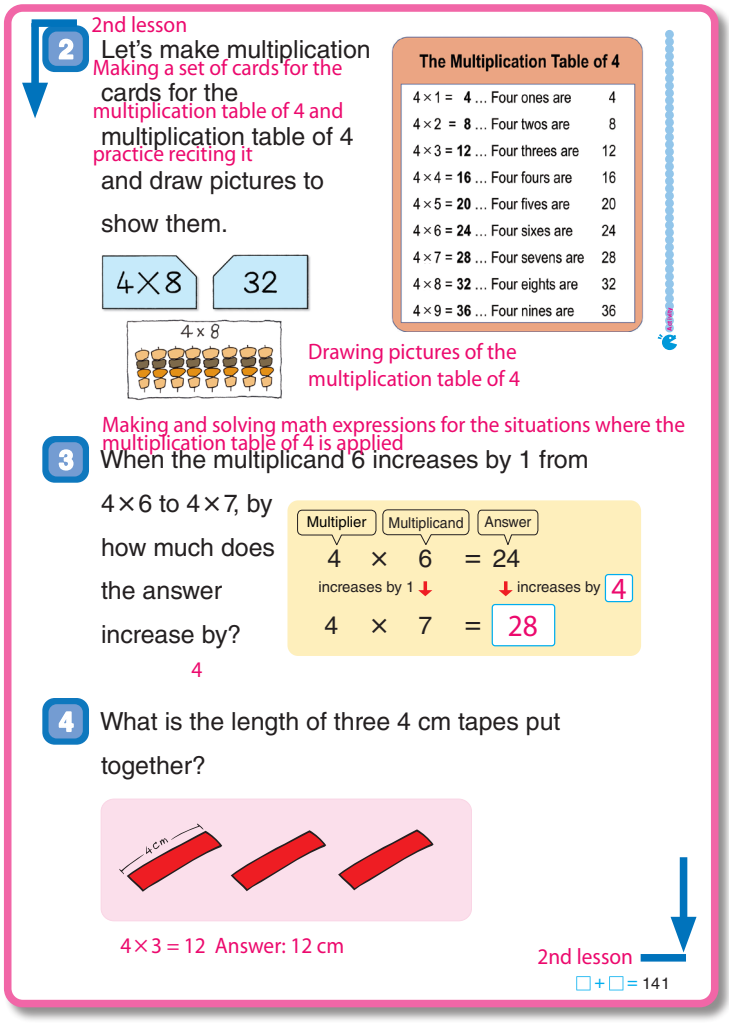
- Cardboard, drawing paper, multiplication table of 4, digital textbook software (if available).

Assessment

- Recite the multiplication table of 4 confidently. F S
- Make a math story that uses the multiplication table of 4. F S

Teacher's Notes

How to Make the Multiplication Table Cards
When making the multiplication table cards as shown in the textbook, pupils are supposed to write 4×8 in the front and 32 at the back.
Teacher should be careful that the size of the numbers are not too small to recognise.
The importance of this lesson is to recite the multiplication table of 4, drawing pictures corresponding to multiplication sentences whilst remembering that" when the multiplicand increases by 1 the answer increases by 4".



Lesson Flow

INTRODUCTION

1 Review

T/P Review key ideas learnt in the previous lesson.

2 Introduce the main task.

T Introduce and explain the main task 'Let's practice using the multiplication table of 4'.

BODY

3 Recite multiplication table of 4

T Demonstrate how to recite the multiplication table of 4.

P Follow Teacher's demonstration and recite the multiplication table of 4 starting from 4×1.

P Practice many times until they can recite it properly regardless of the order.

4 2 Make a set of cards for multiplication table of 4

T/P Make a set of cards for the multiplication table of 4, and memorise it.

P Write on cardboard the multiplication table of 4.

TN By using the cards they made, pupils practice telling the answers at the back from the expressions in the front.

P Separate the cards they answered wrong from the ones they answered correct, and practice the ones they couldn't answer correctly.

5 Draw pictures that represent the Multiplication table of 4.

T Asks pupils to describe the scenes in a picture to which the multiplication table of 4 is applied.

P Draw a picture for the multiplication table of 4 and share their work in pairs or in groups, and check the expressions and the answers.

6 3 Discuss how the answer increases when the multiplicand increases.

T When the multiplier increases by 1, by how much does the answer increase?
4×6=24
4×7=28

P Compare the two math sentences and present what they notice.
Answer: When it increases from 6 to 7 by 1, the answer increases by 4.

7 Find the length of three 4 cm tapes put together.

T Ask pupils to use the multiplication table of 4 and find out the total length of the tapes when they are put together.

P Look at the picture and solve the problem.
Write: (4×3=12. Answer: 12 cm)

CONCLUSION

8 Summary.

T/P Summarise the lesson by confirming students' understanding of the main ideas of the lesson.

Sample Blackboard Plan

Date: **Chapter 11**: Multiplication (2) **Sub-chapter 4:** The Multiplication Table of 4 **Lesson** 2 of 2

Main Task: "Let's practice using the multiplication table of 4"

Review

• Review key ideas with examples.
-The number we multiply is the ***multiplier***. The number to be multiplied is the ***multiplicand***.

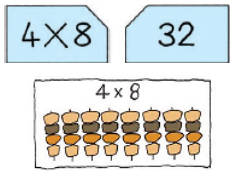
Activities

Recite the multiplication table of 4

The Multiplication Table of 4

4 x 1 = 4 ... Four ones are	4
4 x 2 = 8 ... Four twos are	8
4 x 3 = 12 ... Four threes are	12
4 x 4 = 16 ... Four fours are	16
4 x 5 = 20 ... Four fives are	20
4 x 6 = 24 ... Four sixes are	24
4 x 7 = 28 ... Four sevens are	28
4 x 8 = 32 ... Four eights are	32
4 x 9 = 36 ... Four nines are	36

2 Make a set of cards for the multiplication table of 4 and draw pictures.

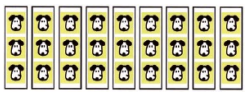


3 By how much does the answer increase when the multiplicand increases by 1?

Multiplier × Multiplicand = Answer
4 × 6 = 24
Increases by 1 ↓ ↓ Increases by 4
4 × 7 = 28

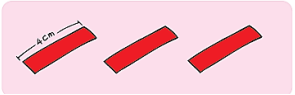
Answer: When it increases from 6 to 7 by 1, the answer increases by 4

3



Answer: 3 x 9 = 27 stickers

4 What is the length of three 4 cm tapes?



Answer: 4 x 3 = 12 cm

Summary

-In the multiplication table of 4, when the multiplicand increase by 1, the total increases by 4.
-We can use the multiplication table of 4 to write multiplication sentences, draw pictures and solve problems.

Unit 11

Unit: Multiplication (2)
Sub-unit: 5. Flash Card Games
Lesson 1 of 2

Textbook Page : p.142
Actual Lesson 100

Sub-unit Objectives

- To practice the multiplication table of 2, 3, 4, and 5.
- To master the multiplication table through the flash card games.

Lesson Objectives

- To make the multiplication table cards with multiplication expressions and answers written on the front and back side.
- To deepen the understanding of the multiplication table of 2, 3, 4, and 5 by playing the flash card game.

Prior Knowledge

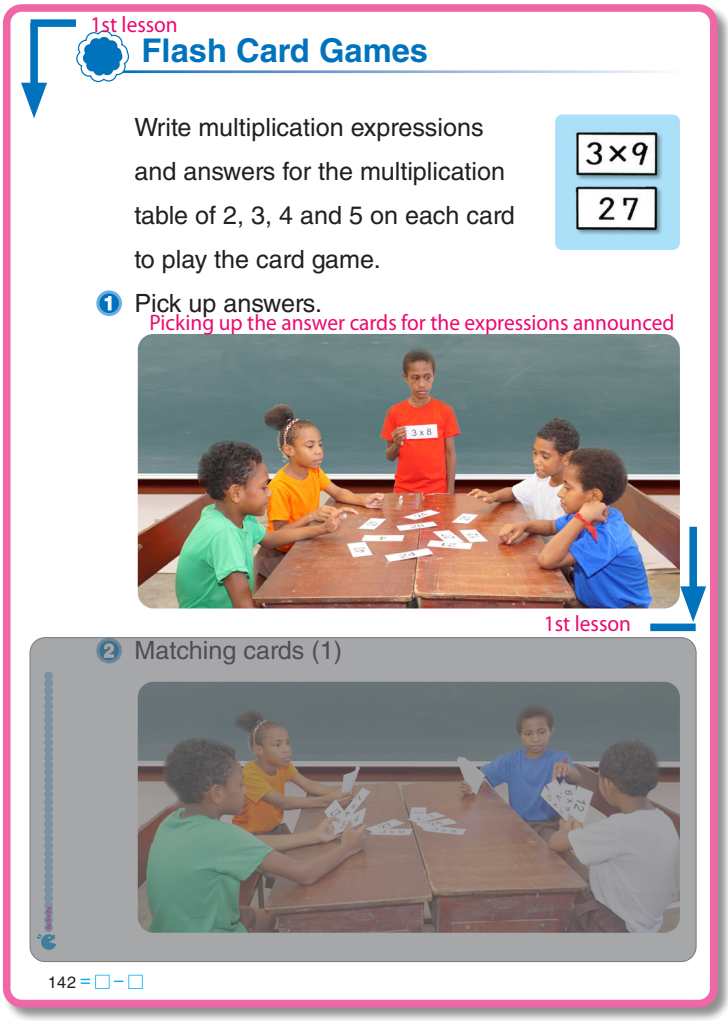
- Meaning of multiplication.
- Sets of the same object.
- Multiplication table of 2, 5, 3 and 4

Preparation

- Paper to write the multiplication expressions and answers on, crayons, The multiplication table of 2, 3, 4 and 5 pupils made in the previous lesson.

Assessment

- Demonstrate mastery of the multiplication table of 2, 3, 4 and 5 while playing the flash card game. F S



Teacher's Notes

1. Tips for Making Flash Cards

The size of the flash cards can be just about half the size of the A4 size paper or letter size paper, ensuring enough space when they are placed on the desks. It should not be too large so that pupils can handle them easily. When making groups of pupils, the appropriate size of the groups would be about 4 – 6 pupils in each group for the activities 1, 2 and 4, and the activity 3 can be a pair activity.

The process of making flash cards is also a part of the learning. Teacher can group pupils into pairs, and have one pupil in each pair read aloud a multiplication expression and write it down on the front side of the paper, and have another pupil write the answer on the back. Through such activities, pupils' understanding of the multiplication table can be reinforced.

2. Tips for Utilising Games in Lessons

Games are effective in fostering pupils' motivation, proactive individual learning and content mastery.

In order to further improve their motivation, Teacher can have pupils make score sheets and record their points and ranking. However, to actualise the meaningful learning through games and avoid the misuse of games as something fun, Teacher should ensure that pupils clearly understand the objective of each game (such as "to memorise the multiplication table properly") and encourage them to learn from each other while carrying it out.

Lesson Flow

INTRODUCTION

1 Review.

T/P Review key ideas learnt in the previous lesson.

TN Recite the 2, 3, 4 and 5 times table.

2 Introduce the main task.

T Introduce and explain the main task 'Let's play pick up answers for multiplication tables of 2, 3, 4 and 5.

BODY

3 Play the "Pick up Answers" game.

T Introduce the multiplication card game to the pupils and provide sets of multiplication cards to pupils.

P 1 Look at the picture, and try to understand how the game is played.

T Tells pupils to look at the picture of children playing a game and have them discuss what children are doing in the picture. Teacher also checks with pupils how to play the game.

T Briefly explain how the pick-up answers game can be played.

P Play the "pick up answers" game in groups.

CONCLUSION

4 Summary.

T/P Summarise the lesson by confirming students' understanding of the main ideas of the lesson through the multiplication card games.

Sample Blackboard Plan

Date: **Chapter 11**: Multiplication (2) **Sub-chapter 5:** Flash Card Games **Lesson** 1 of 2

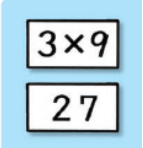
Main Task: **"Let's play pick up answers for multiplication tables of 2, 3, 4 and 5".**

Review

• Recite the 2,3,4 and 5 times tables.

Activities

Prepare sets of cards for the 2, 3, 4 and 5 times tables as shown and spread them on the table or desk.



1 ***Pick up answers game instructions***;

- Pupils can play the game in groups of 3 or more.
- One member of the team should flash a card showing an expression.
- The rest of the team members should try to find the card with the answer as quick as they can.
- The member holding the most cards with the answers is the winner.
- Pupils can take turns in flashing the expression cards while the others pick up answer cards

Summary

We can easily win the game if we know our times tables.

Unit 11

Unit: Multiplication (2)
Sub-unit: 5. Flash Card Games
Lesson 2 of 2

Textbook Page : p.142~143
Actual Lesson 101

Lesson Objectives

- To deepen the understanding of the multiplication table while playing the comparing the cards game in which the answers of the selected multiplication expressions are compared.
- To deepen the understanding of the multiplication table while playing the game in which the expression cards and answer cards that are faced down on the table should be turned over and matched.

Prior Knowledge

- Multiplication tables of 2, 3, 4 and 5.

Preparation

- The multiplication table of 2, 3, 4 and 5 pupils made in the previous lesson.

Teacher's Notes

In this lesson, pupils will contonue to play flash card games of multiplication.
Refer to the game rules or instructions on the board plan for pupils to familiarise themselves with the rules before actually playing the game.

Flash Card Games

Write multiplication expressions and answers for the multiplication table of 2, 3, 4 and 5 on each card to play the card game.

3×9
27

1 Pick up answers.



2nd lesson

2 Matching cards (1)

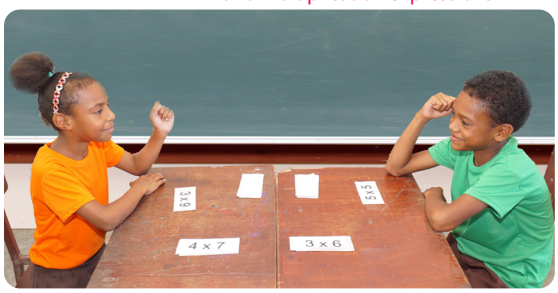
Matching the expressions and answers



142 = □ − □

3 Comparing cards

Comparing the answers of the two multiplication expressions



Which is larger, 2×8 or 4×5?
16 20

How about 5×6 or 3×9?
30 27

In what case, are the answers the same?

4 Matching cards (2)

Matching the expressions and answers



If you pick up the 24 and 4×6 cards, can you keep them?

Yes, we can keep them.

2nd lesson

□ + □ = 143

Lesson Flow

INTRODUCTION

1 Review.

T/P Review key ideas learnt in the previous lesson.

2 Introduce the main task.

T Introduce and explain the main task 'Let's play flash card games for multiplication tables of 2, 3, 4 and 5'.

BODY

3 ② Play a game of comparing the answers of the multiplication expressions they selected.

T Tell pupils to look at the picture of children playing a game and have them discuss what the children are doing in the picture. Teacher also checks with pupils on how to play the game.

- Use only the expression cards (no need for the answer cards). Make pairs and select one card each. Look at the cards and compare which of the selected two expressions has a larger answer.
- The one who has a card with a larger answer gets the partner's card.
- The one who has more cards is a winner.

P Play this game in pairs.

4 ③ Compare the answers of "2×8" and "4×5", and "5×6" and "3×9".

P Compare the answers of pairs of expressions

1. "2×8" and "4×5" --- "4×5" is larger.
2. "5×6" and "3×9" --- "5×6" is larger.

5 ④ Play a game of matching the expression and answer cards.

TN Pupils are supposed to turn over the cards faced down and match them just like a "concentration" card game.

T Tell pupils to look at the picture of children playing a game and have them discuss what children are doing in the picture.
Teacher also checks with pupils on how to play the game.

- The rule is the same as the concentration game.
- The one who has more cards is a winner.

P Pupils think whether they can keep the cards "24" and "4×6" as a pair.

P Play the game in groups.

CONCLUSION

6 Summary

T/P Summarise the lesson by confirming students' understanding of the main ideas of the lesson.

Sample Blackboard Plan

Date: **Chapter 11**: Multiplication (2) **Sub-chapter 5:** Flash Card Games **Lesson** 2 of 2

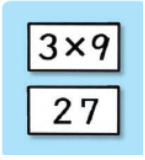
Main Task: "Let's play pick up answers for multiplication tables of 2, 3, 4 and 5."

Review

- Recite the 2,3,4 and 5 times tables.

Activities

Prepare sets of cards for the 2, 3, 4 and 5 times tables as shown and spread them on the table or desk same as ① Pick up answer game.



Game 1

② ***Comparing answers game instructions***;

- Pupils can play the game in pairs.
- Use the cards with the expressions only.
- Randomly pick up a card with an expression.
- Compare the answer with your partner.
- The person holding the expression with the larger answer gets the partner's card.
- The person holding most cards wins the game.

Game 2

③ ***Comparing answers game instructions***;

- Pupils can play the game in pairs.
- Use the cards with the expressions only.
- Pick a card at the same time.
- Compare the answer with your partner.
- The first person to respond by identifying the expression with the largest answer keeps both cards.
- The person holding most cards wins the game.

Game 3

④ ***Pick up answers game***;

- Pupils can play the game with 2 or more friends.
- Place all cards face down..
- Randomly pick up a card and flip it over in turns.
- If anyone flips a card that matches another by answer or expression, he/she keeps the pair of cards.
- The person holding most cards wins the game.

Summary

We can memorize our times tables by playing these games.

Unit 11

Unit: Multiplication (2)
Exercise
Lesson 1 of 1

Textbook Page : p.144~145
Actual Lesson 102

Lesson Objective
- To review what has been learnt in the chapter.

Prior Knowledge
- All content learnt in the chapter.

Preparation
- Worksheets for the Exercises.

Assessment
- Review what has been learnt in the chapter. F S

Teacher's Notes
The exercises in this lesson focus mainly on reviewing the learning of the 2, 5, 3 and 4 times tables.

1st lesson

Exercise

1 Let's do multiplications. Pages 134 ~ 141

① 2×2 4	② 5×3 15	③ 3×7 21
④ 3×6 18	⑤ 2×8 16	⑥ 5×7 35
⑦ 5×9 45	⑧ 4×1 4	⑨ 3×2 6
⑩ 3×3 9	⑪ 4×6 24	⑫ 2×7 14
⑬ 4×8 32	⑭ 3×9 27	⑮ 4×5 20
⑯ 2×9 18	⑰ 5×2 10	⑱ 4×4 16
⑲ 5×4 20	⑳ 2×5 10	㉑ 5×6 30
㉒ 3×8 24	㉓ 4×2 8	㉔ 2×1 2

2 Word problem where the multiplication table of 2 is used

2 children are riding in each bumper car.

There are 4 cars. How many children are there altogether? Page 134



2×4 = 8 Answer: 8 children

3 Word problem where the multiplication table of 3 is used

There are 3 eggplants in each bag.

How many eggplants are there in 7 bags? Page 138



3×7 = 21 Answer: 21 eggplants

144

4 Filling in the table based on the multiplication table of 2, 3, 4 and 5

Let's write down what you have learned in the multiplication table. Pages 134 ~ 141

Multiplicand / Multiplier	1	2	3	4	5	6	7	8	9
2	2	4	6	8	10	12	14	16	18
3	3	6	9	12	15	18	21	24	27
4	4	8	12	16	20	24	28	32	36
5	5	10	15	20	25	30	35	40	45

① Let's change the order of the multiplier and make another multiplication table.

Multiplicand / Multiplier	1	2	3	4	5	6	7	8	9
4	4	8	12	16	20	24	28	32	36
2	2	4	6	8	10	12	14	16	18
3	3	6	9	12	15	18	21	24	27
5	5	10	15	20	25	30	35	40	45

② Change the order of the multiplier by yourself and develop the multiplication table.

Multiplicand / Multiplier	1	2	3	4	5	6	7	8	9
5	5	10	15	20	25	30	35	40	45
4	4	8	12	16	20	24	28	32	36
3	3	6	9	12	15	18	21	24	27
2	2	4	6	8	10	12	14	16	18

1st lesson

145

Lesson Flow

EXERCISE

1 Review the multiplication table of 2, 3, 4 and 5.

TN Assess whether pupils have accurately memorised the multiplication table of 2, 3, 4 and tell pupils to copy all the multiplication expressions and write the answers next to each.

2 Recognise the situations where the multiplication of 2 is applied, make a multiplication expression and find the answer.

TN Advise pupils to first identify (i) how many children are in each bumper car, and (ii) for how many bumper cars they are looking and make an expression to find the answer.

3 Recognise the situations where the multiplication of 3 is applied, make a multiplication expression and find the answer.

TN As the textbook only shows a picture of 1 bag, instead of 7, make sure that pupils understand the situation of the presented word problem. Explain to pupils that the situation can be interpreted simply as 3 eggplants in each bag, for 7 bags, and tell them to make a multiplication expression and find the answer.

4 Fill in the presented table utilising the multiplication table of 2, 3, 4 and 5 they learned.

TN For pupils who cannot easily tell the answers, advises them to refer back to previous lessons or look at their own multiplication cards for reference.

① Unlike the first table, this table has the row numbers shuffled and does not show any numbers as a clue. Check whether pupils can complete the table without a problem.

② Pupils can decide on the order of the row numbers as they like.
This activity should help them strengthen their understanding of the multiplication table of 2, 3, 4 and 5.

TN For pupils who finished early, Give them the supplementary problems.

Sample Blackboard Plan

Date: **Chapter 11**: Multiplication (2) **Sub-chapter:** Exercises **Lesson** 1 of 1

Exercises

1 Recite the 2,3,4 and 5 times tables.

2 

4 x 2 = 6
Answer: 6 children

3 7 x 3 = 21
Answer: 21 eggplants

4 Write down what you have learned In the multiplication table.

Multiplicand / Multiplier	1	2	3	4	5	6	7	8	9
2	2	4	6	8	10	12	14	16	18
3	3	6	9	12	15	18	21	24	27
4	4	8	12	16	20	24	28	32	36
5	5	10	15	20	25	30	35	40	45

①

Multiplicand / Multiplier	1	2	3	4	5	6	7	8	9
4									
2									
3									
5									

Answers will vary according to pupils ordering of the multiplier

②

Multiplicand / Multiplier	1	2	3	4	5	6	7	8	9

Answers will vary according to pupils ordering of the multiplier

End of Chapter Test: Chapter 11 **Date:**

Evaluation: Chapter 11 Multiplication (2)	Name:	Score /100

1. Do multiplications. [5 points for each question]

(1) $4 \times 5 =$ (2) $2 \times 7 =$ (3) $5 \times 6 =$ (4) $3 \times 1 =$

(5) $5 \times 2 =$ (6) $4 \times 8 =$ (7) $2 \times 9 =$ (8) $3 \times 8 =$

[10 points for math sentence and 10 points for answer]

2. Each bag contains 3 apples, how many apples are there in 4 bags?

Math sentence: _____ Answer: _____

3. There are 7 tapes. Each tape is 5 cm long, how long will the tape be if all of them are connected?

Math sentence: _____ Answer: _____

4. 4 eggs make up one pack, how many eggs are there in 9 packs? Math sentence

Math sentence: _____ Answer: _____

Chapter 12 Multiplication (3)

1. Unit Objectives

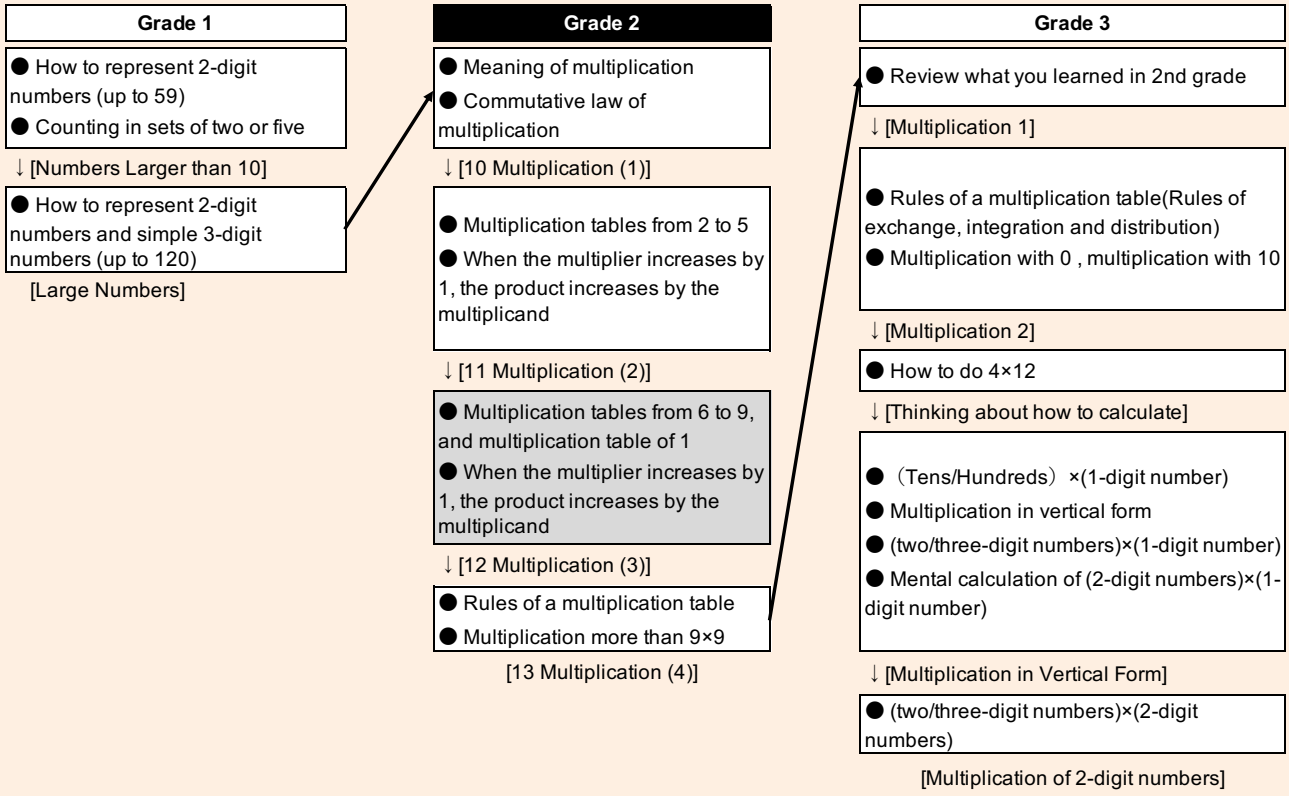
- To understand the meaning of multiplication and use the calculation.
- To get to know situations where multiplication is used.
- To explore simple properties which hold for multiplication, and to make use of them for making a multiplication table up to 9 times 9 and checking the results of calculations.
- To learn the multiplication table up to 9 times 9 and to multiply one-digit numbers accurately.
- To get to know situations where multiplication is used, and to understand the meaning of multiplication through activities of representing the situations with algebraic expressions and interpreting the presented expressions.

2. Teaching Overview

In this unit, pupils will understand the structure of the multiplication tables from 6 to 9, and the multiplication table of 1. Then, pupils discover that when the multiplier increases by one, the product increases by the multiplicand, and also find the commutative law.
In addition, make pupils aware of a view like $8\times5=3\times5+5\times5$.
What Kind of Calculation Is This? Pupils will read the structure of the problem, determine the calculation, and deepen their understanding of the merits of solving with multiplication.

Key Concepts: Multiplication tables of 6 to 9 and rules of multiplication.

3. Related Learning Contents



Unit 12

Unit: Multiplication (3)
Sub-unit: 1. The Multiplication Table of 6
Lesson 1 of 2

Textbook Page : p.146
Actual Lesson 103

Sub-unit Objectives

- To recognise situations and word problems of multiplication with a multiplier 6 and solve them to find the answers.
- To make a multiplication table of 6 and memorise it.
- To understand that when a multiplicand increases by 1, the answer increases by the amount of a multiplicand.

Lesson Objectives

- To solve the word problem for identifying the total number of pieces of cheese in each box.
- To make the multiplication table of 6.
- To understand that when a multiplicand increases by 1, the answer increases by the amount of a multiplicand.

Prior Knowledge

- Multiplication tables 2-5.

Preparation

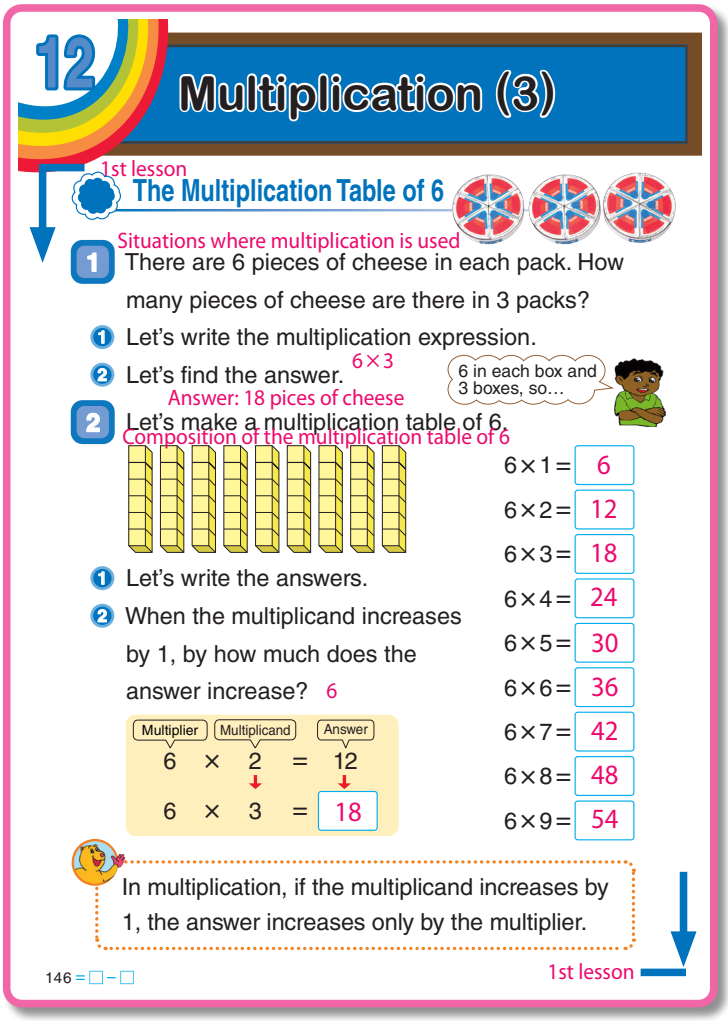
- 9 sets of 6 blocks (sets of magnetic blocks for posting on the blackboard, and sets of blocks for pupils' use), digital textbook software (if available).

Assessment

- Make the multiplication table of 6 through problem solving. F
- Demonstrate understanding that when a multiplier increases by 1, the answer increases by the amount of the multiplicand 6. F S

Teacher's Notes

This chapter is a continuation from Multiplication (2) and will follow the similar approaches in the lessons. Students can understand multiplication as the operation to determine the total number when given the number in a group and the number of groups, The multiplication tables 6-9 is taught, and it is important that students become proficient with multiplication of 1-digit numbers. Furthermore, to deepen their understanding of multiplication facts, students are taught simple cases of multiplication between 2-digit numbers and 1-digit numbers. Pupils will then use the learnt times tables to solve problems.


12 Multiplication (3)

1st lesson
The Multiplication Table of 6

Situations where multiplication is used
1 There are 6 pieces of cheese in each pack. How many pieces of cheese are there in 3 packs?
1 Let's write the multiplication expression.
2 Let's find the answer. 6×3
Answer: 18 pices of cheese
6 in each box and 3 boxes, so…
2 Let's make a multiplication table of 6.
Composition of the multiplication table of 6
1 Let's write the answers.
2 When the multiplicand increases by 1, by how much does the answer increase? 6

Multiplier | Multiplicand | Answer
6 × 2 = 12
6 × 3 = 18

6×1=6
6×2=12
6×3=18
6×4=24
6×5=30
6×6=36
6×7=42
6×8=48
6×9=54

In multiplication, if the multiplicand increases by 1, the answer increases only by the multiplier.

146 = □ − □
1st lesson

Lesson Flow

INTRODUCTION

1 Discuss the picture or situation.

T Show the picture of cheese in the boxes.

T/P Discuss how they can find the total number of cheese pieces in the boxes.

P Make suggestions based on their understanding from previous lessons on Multiplication tables 2-5.

TN Allow pupils to express their suggestions freely.

BODY

2 Introduce the main task.

T Introduce and explain the main task, "Let's make the Multiplication Table of 6"

3 (1) Multiplication with 6.

TN Read the word problem and let the pupils recognise that this lesson is on the multiplication table of 6, and find out the total number of pieces of cheese in the 3 boxes.

T There are 6 pieces of cheese in each box. How many pieces of cheese are there when we have 3 boxes?

T (1) Get the pupils to write a math expression for the problem.

P By thinking there are 6 pieces in each box, for 3 boxes, pupils make a math expression 6×3.

TN Explain so that pupils understand the words "multiplicand" and "multiplier".

T (2) "Let's find the answer of this expression".

P Find the answer "18 pieces" by applying the learning from the previous lessons using the following; Count one by one. /Count by 2s. / Calculate by repeated addition.

4 (2) Make the multiplication table of 6.

T Ask the pupils to think freely and make the multiplication table of 6 in their own ways.

TN Remind pupils of how they made the tables of 2, 3, 4 and 5.

P (1) Complete the multiplication table of 6 by filling in the answers to the expressions.

5 Discuss what happens to the answer when the multiplicand increases by 1.

T (2) "When a multiplicand increases by 1, by how much does the answer increase?"

P Expected response; "Answer always increases by 6 when the multiplicand increases by 1".

TN Confirm with pupils that in the multiplication table of 6, the answer always increases by 6 when the multiplicand increases by 1.

T/P Read the important point in .

CONCLUSION

6 Summary.

T/P Summarise the lesson by confirming students' understanding of the main idea of the lesson.

Sample Blackboard Plan

Date: **Chapter 12**: Multiplication (3) **Sub-chapter 1:** Multiplication Table of 6 **Lesson** 1 of 2

Main Task: "Let's make the Multiplication Table of 6"

Introduction

Think about how to find the number of cheese.



Activities

1 There are 6 pieces of cakes in each box. How many pieces of cakes are there in 3 boxes?

multiplier multiplicand

(1) **Expression:** 6 x 3

(2) **Answer:** 18 pieces

2 Let's make multiplication table of 6

(1)

6×1= 6
6×2= 12
6×3= 18
6×4= 24
6×5= 30
6×6= 36
6×7= 42
6×8= 48
6×9= 54

(2) What happens to the answer when a multiplicand increases by 1?

Multiplier		Multiplicand		Answer
6	×	2	=	12
6	×	3	=	18

In multiplication, if the multiplicand increases by 1, the answer increases only by the multiplier.

Summary

In the multiplication table of 6, when the multiplicand increases by 1, the answer increases by 6.

Unit 12

Unit: Multiplication (3)
Sub-unit: 1. The Multiplication Table of 6
Lesson 2 of 2

Textbook Page : p.147
Actual Lesson 104

Lesson Objectives

- To learn about how to recite the multiplication table of 6 and practice.
- To solve math problems using the multiplication table of 6.

Prior Knowledge

- Multiplication tables 2-5

Preparation

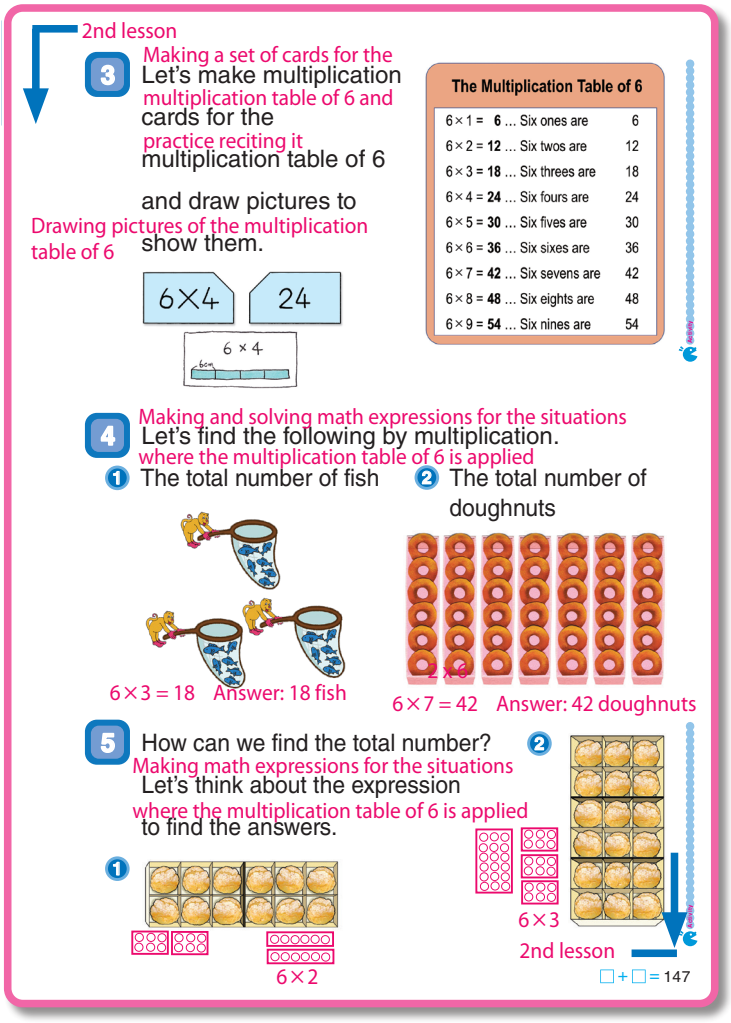
- Cardboard, drawing paper, the multiplication table of 6, digital textbook software (if available).

Assessment

- Make the multiplication cards of 6 times-table. F
- Solve math problems using the multiplication table of 6. F S

Teacher's Notes

When making the multiplication table cards as shown in the textbook, pupils are supposed to write 6×4 in the front and 24 at the back. Teacher should be careful that the size of the numbers are not too small to recognise in order to deliver the lesson smoothly nd effectively.



Lesson Flow

INTRODUCTION

1 Review.

T/P Review key ideas learnt in the previous lesson.

BODY

2 Introduce the main task.

T Introduce and explain the main task, "Let's practice using the Multiplication Table of 6"

3 Recite the multiplication table of 6.

T "Practice saying the multiplication table of 6. Repeat after me."

T/P Six ones is 6, six twos is 12, six threes is 18, six fours is 24, six fives is 30, six sixes is 36, six sevens is 42, six eights is 48, six nines is 54.

P Practice several times in the regular order.

T Let pupils practice saying it from the back or change the order.

TN Encourage pupils to come up with the right answers regardless of the order.

Lesson Flow

4 **3 Make a set of cards for the multiplication table of 6, and memorise it.**

T "Let's make the cards for the multiplication table of 6."

P Write on cardboard the multiplication table of 6.
Example Front 6×4 (Expression)
Back 24 (Answer)

P Practice saying the answers at the back from the expressions in the front of the cards.

5 **Draw a picture representing the multiplication table of 6.**

T Let pupils draw pictures for the multiplication table of 6.

P Draw a picture for the multiplication table of 6 and share their work in pairs or in groups and check the expressions and the answers.

6 **4 Solve the problem where the multiplication table of 6 is used.**

T 4 "Look at the pictures ① and ② and make math sentences and identify the total number of fish and doughnuts."

P Expected answers;

① Fish: 6 fish in each bowl, for 3 bowls.
6×3=18 Answer: 18 fish

② Doughnuts: 6 doughnuts in each box, for 7 boxes.
6×7=42 Answer: 42 doughnuts

7 **5 Read the word problem and make math expressions to find the answers.**

T Look at the pictures ① and ② and make math expressions to find the total number of pieces of cake.

P Expected answers:
6 pieces of cakes for 2 sets, so it is 6×2.
6 pieces of cakes for 3 sets, so it is 6×3.

TN It is also correct if pupils make sets as follows;
For ①, making sets of 2 with an expression 2×6
For ②, making sets of 3 with an expression 3×6

CONCLUSION

8 **Summary.**

T/P Summarise the lesson by confirming students' understanding of the main ideas of the lesson.

Sample Blackboard Plan

Date: **Chapter 12**: Multiplication (3) **Sub-chapter 1:** Multiplication Table of 6 **Lesson** 2 of 2

Main Task: "Let's practice using the Multiplication Table of 6"

Review

- Review key ideas with examples.
- In the multiplication table of 6, when the multiplicand increase by 1, the answer increases by 6.

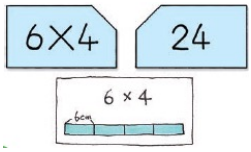
Activities

Recite the multiplication table of 6.

The Multiplication Table of 6

6 x 1 = **6** ... Six ones are	6
6 x 2 = **12** ... Six twos are	12
6 x 3 = **18** ... Six threes are	18
6 x 4 = **24** ... Six fours are	24
6 x 5 = **30** ... Six fives are	30
6 x 6 = **36** ... Six sixes are	36
6 x 7 = **42** ... Six sevens are	42
6 x 8 = **48** ... Six eights are	48
6 x 9 = **54** ... Six nines are	54

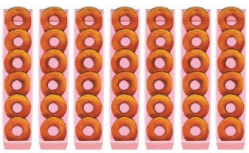
3 Make a set of cards for the multiplication table of 6 and draw pictures.



4 Find the following by multiplication.

① 

Answer: **6 x 3 = 18 fish**

② 

Answer: **6 x 7 = 42 doughnuts**

5 Write the expression to find the total..

① **6 x 2**

② **6 x 3**

Summary

We can use the multiplication table of 6 to write multiplication sentences, draw pictures and solve problems.

Unit 12

Unit: Multiplication (3)
Sub-unit: 2. The Multiplication Table of 7
Lesson 1 of 2

Textbook Page : p.148
Actual Lesson 105

Sub-unit Objectives

- To recognise situations and word problems of multiplication with a multiplier 7 and solve them to find the answers.
- To make a multiplication table of 7 and memorise it.

Lesson Objectives

- To solve the word problems for identifying the total number of pens based on the number of pens in each box and that of the boxes.
- To make the multiplication table of 7 through this problem-solving activity.
- To understand that in the multiplication table of 7, when a multiplicand increases by 1, the answer increases by the amount of a multiplier.

Prior Knowledge

- Multiplication tables 2-6

Preparation

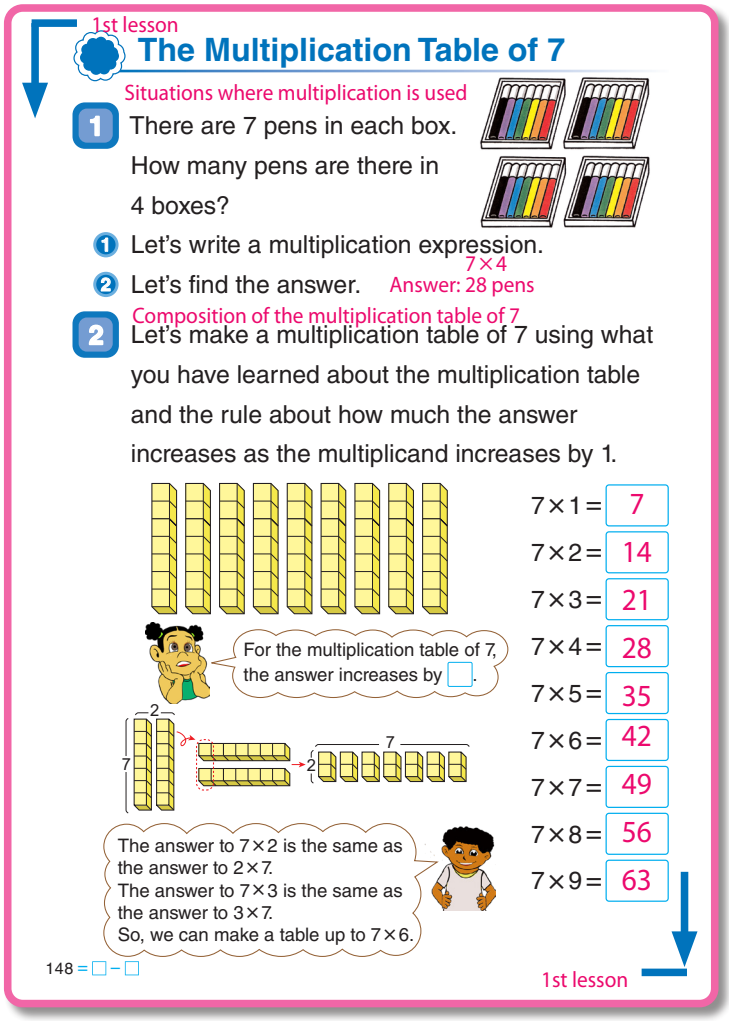
- Packets of 7 pens (or picture of such), 9 sets of 7 blocks (sets of magnetic blocks for posting on the blackboard and sets of blocks for pupils' use digital textbook software (if available).

Assessment

- Make the multiplication table of 7 through problem solving. F
- Demonstrate understanding that when a multiplicand increases by 1, the answer increases by the amount of the multiplier 7. F S

Teacher's Notes

In this lesson, the multiplication table of 7 is taught, and it is important that students become proficient with multiplication of 1-digit numbers. Furthermore, to deepen their understanding of multiplication facts, students are taught simple cases of multiplication between 2-digit numbers and 1-digit numbers. Pupils are expected to utilize their learning of the times table to solve problems



Lesson Flow

INTRODUCTION

1 Review.

T/P Review key ideas learnt in the previous lesson.

2 Understand the picture or situation.

T Show the picture of coloured pens.

T/P Discuss how they can find the total number of coloured pens in the packets.

P Make suggestions based on their understanding from previous lesson on Multiplication table of 6.

TN Allow pupils to express their suggestions freely.

Lesson Flow

BODY

3 Introduce the main task.

T Introduce and explain the main task, "Let's make the Multiplication Table of 7"

4 ① Multiplication with 7.

TN Read the word problem and let the pupils recognise that this lesson is on the multiplication table of 7, and find out the total number of coloured pens in 4 packets.

T There are 7 pens in each box. How many pens are there when we have 4 boxes? Let's write a multiplication expression.

T ① Get the pupils to write a math expression for the problem.

P When there are 7 pens in each box, for 4 boxes, the expression is 7×4.

T ② "Let's find the answer of this expression."

P Find the answer in various different ways to get the answer 28 using the following;
Count one by one. /Count by 2s. /Calculate by repeated addition.

5 ② Make the multiplication table of 7.

T Ask the pupils to think freely and make the multiplication table of 7 in their own ways.

TN Advise pupils to utilise the increasing pattern in multiplication they have studied in the previous lessons like the multiplication table of 6.

P Identify the pattern of adding 7 each time to get the next number and complete the multiplication table of 7 by filling in the answers to the expressions.

6 Discuss what happens to the answer when the multiplicand increases by 1.

T "When the multiplicand increases by 1, by how much does the answer increase?"

P Expected response;
"Answer always increases by 7 when the multiplicand increases by 1."

TN Confirm with pupils that in the multiplication table of 7, the answer always increases by 7 when the multiplicand increases by 1.

T Get the pupils to understand that in 7×2 and 2×7, the answers remain the same even when the multipliers and the multiplicands are switched.

CONCLUSION

7 Summary.

T/P Summarise the lesson by confirming students' understanding of the main ideas of the lesson.

Sample Blackboard Plan

Date: **Chapter 12**: Multiplication (3) **Sub-chapter 2:** Multiplication Table of 7 **Lesson** 1 of 2

Main Task: "Let's make the Multiplication Table of 7"

Review

- Review key ideas with examples.
- We can use the multiplication table of 6 to write multiplication sentences, draw pictures and solve problems.

Activities



1 There are 7 pens in each box. How many pens are there when we have 4 boxes?

multiplier multiplicand

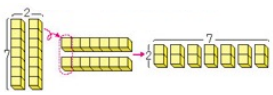
① **Expression:** **7** x 4

② **Answer:** **28** pens

2 Let's make multiplication table of 7

7×1=	7
7×2=	14
7×3=	21
7×4=	28
7×5=	35
7×6=	42
7×7=	49
7×8=	56
7×9=	63

The answer increases by 7 when the multiplicand increases by 1.



The answer to 7 x 2 is the same as 2 x 7.

Summary

In the multiplication table of 7, when the multiplicand increases by 1, the answer increases by 7.

Unit 12

Unit: Multiplication (3)
Sub-unit: 2. The Multiplication Table of 7
Lesson 2 of 2

Textbook Page : p.149
Actual Lesson 106

Lesson Objectives

- To learn about how to recite the multiplication table of 7 and practice.
- To solve math problems using the multiplication table of 7.

Prior Knowledge

- Multiplication tables 2-6

Preparation

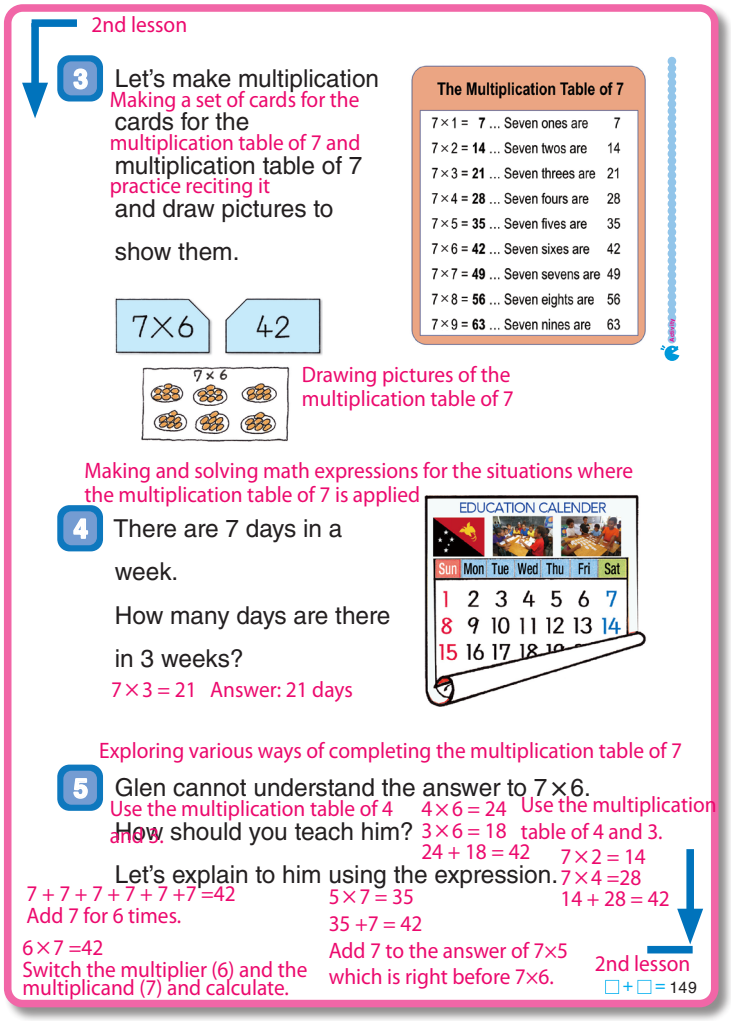
- Cardboard, drawing paper, the multiplication table of 7 and digital textbook software (if available).

Assessment

- Make the multiplication cards of 7 times-table. F
- Solve math problems using the multiplication table of 7. F S

Teacher's Notes

When making the multiplication table cards as shown in the textbook, pupils are supposed to write 7×6 in the front and 42 at the back. Teacher should be careful the size of the numbers are not too small to recognise in order to deliver the lesson smoothly and effectively.



Lesson Flow

INTRODUCTION

1 Review.

T/P Review key ideas learnt in the previous lesson.

BODY

2 Introduce the main task.

T Introduce and explain the main task "Let's practice using the Multiplication Table of 7"

3 Recite the multiplication table of 7.

T "Practice saying the multiplication table of 7. Repeat after me."

T/P Seven ones is 7, seven twos is 14, seven threes is 21, seven fours is 28, seven fives is 35, seven sevens is 49, seven eights is 56, seven nines is 63

P Practice several times in the regular order.

T Tell the pupils to practice saying it from the back or change the order.

TN Encourage pupils to come up with the right answers regardless of the order.

Lesson Flow

4 3 Make a set of cards for the multiplication table of 7, and memorise it.

T "Let's make the cards for the multiplication table of 7."

P Write on cardboard the multiplication table of 7.
Example: Front 7×6 (Expression)
Back 42 (Answer)

P Practice saying the answers at the back from the expressions in the front of the cards.

5 Draw a picture representing the multiplication table of 7

T Get the pupils to draw pictures for the multiplication table of 7.

P Draw a picture for the multiplication table of 7 and share their work in pairs or in groups and check the expressions and the answers.

6 4 Solve the problem where the multiplication table of 7 is used.

T There are 7 days in a week. How many days are there in 3 weeks? Let's write a math sentence and find the answer.

P Expected answer:
There are 7 days times 3 weeks, so it should be
7×3=21 Answer 21 days

TN By referring to the picture of a calendar on p.149, confirm with pupils that the number of days in each week is the multiplier and that the number of weeks is the multiplicand.

7 5 Explore various ways of finding the answer of 7×6.

T If we want to help our friends who cannot find the answer to 7×6, how can we explain to them? Let's try to think of good explanations by using math sentences.

P Possible Answers;

- We can add 7 for 6 times. 7+7+7+7+7+7=42
- We can add 7 to the answer of 7×5 which is right before 7×6.
  7×5=35 35+7=42
- We can switch the multiplicand (6) and the multiplier (7). 6×7=42
- Use the multiplication table of 3 and 4. Combine the answers. (4×6=24)+(3×6=18)
- Add 2 sets of 7 and 4 sets of 7 together.

CONCLUSION

8 Summary.

T/P Summarise the lesson by confirming students' understanding of the main ideas of the lesson.

Sample Blackboard Plan

Date: **Chapter 12**: Multiplication (3) **Sub-chapter 2:** Multiplication Table of 7 **Lesson** 2 of 2

Main Task: "Let's practice using the Multiplication Table of 7"

Review

- Review key ideas with examples.
- In the multiplication table of 7, when the multiplicand increase by 1, the answer increases by 7.

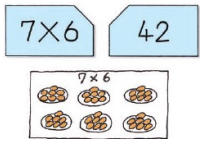
Activities

Recite the multiplication table of 7.

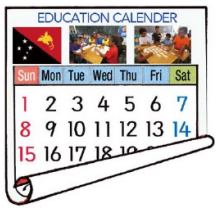
The Multiplication Table of 7

7 x 1 = **7** ... Seven ones are	7
7 x 2 = **14** ... Seven twos are	14
7 x 3 = **21** ... Seven threes are	21
7 x 4 = **28** ... Seven fours are	28
7 x 5 = **35** ... Seven fives are	35
7 x 6 = **42** ... Seven sixes are	42
7 x 7 = **49** ... Seven sevens are	49
7 x 8 = **56** ... Seven eights are	56
7 x 9 = **63** ... Seven nines are	63

3 Make a set of cards for the multiplication table of 7 and draw pictures.



4 There are 7 days in a week. How many days are there in 3 weeks.



Answer: **7 x 3 = 21 days**

5 Explain how to get the answer for 7 x 6

Answers;

- We can add 7 for 6 times.
  7+7+7+7+7+7=42
- We can add 7 to the answer of 7 × 5 which is right before 7 × 6.
  7 × 5 = 35 35 + 7 = 42
- We can switch the multiplier (6) and the multiplicand (7). 6 × 7 = 42
- Use the multiplication table of 3 and 4. Combine the answers.
  (4 × 6) + (3 x 6)
- Add 2 sets of 7 and 4 sets of 7 together.

Summary

We can use the multiplication table of 7 to write multiplication sentences, draw pictures and solve problems.

Unit 12

Unit: Multiplication (3)
Sub-unit: 3. The Multiplication Table of 8
Lesson 1 of 2

Textbook Page : p.150
Actual Lesson 107

Sub-unit Objectives

- To recognise situations and word problems of multiplication with a multiplier 8 and solve them to find the answers.
- To make a multiplication table of 8 and memorise it.

Lesson Objectives

- To solve the word problem for identifying the total length of tape needed to give to 3 children based on the information that each child receives a piece of tape that is 8 cm long.
- To make the multiplication table of 8.
- To realise the commutative law of multiplication as well as the rule and pattern of how the answers increase.

Prior Knowledge

- Multiplication tables 2-7

Preparation

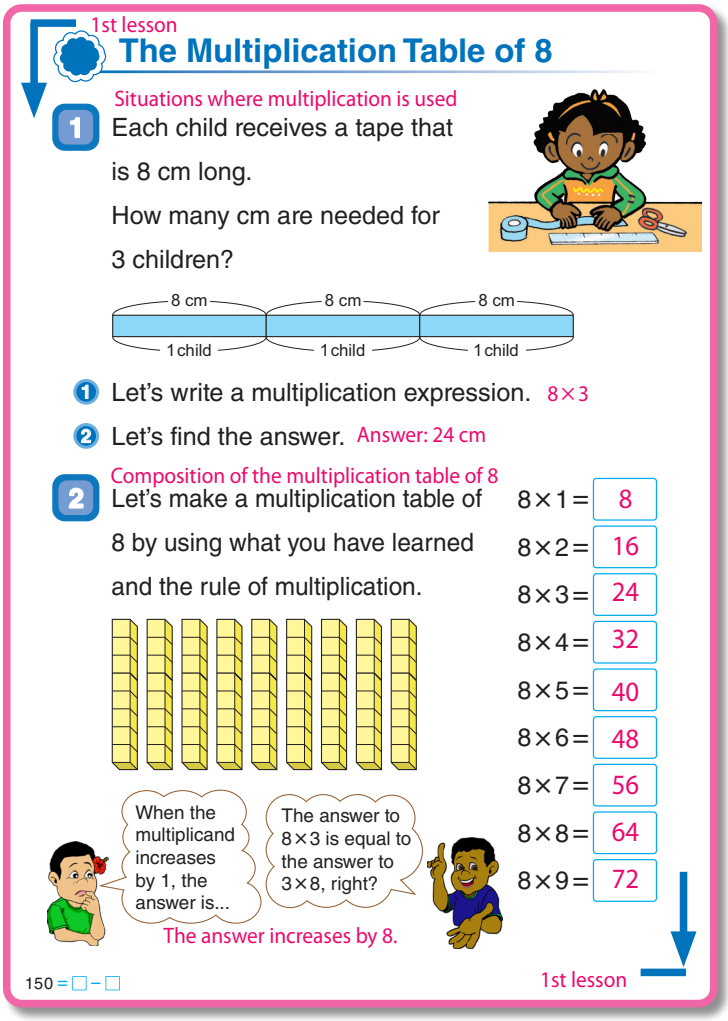
- Picture of tapes, 9 sets of 8 blocks (sets of magnetic blocks for posting on the blackboard), sets of blocks for pupils' use and digital textbook software (if available).

Assessment

- Make the multiplication table of 8 through problem solving. F
- Demonstrate understanding that when the multiplicand increases by 1, the answer increases by the amount of the multiplier 8. F
- Understand the commutative law of multiplication. F S

Teacher's Notes

In this lesson, the multiplication table of 8 is taught, and it is important that students become proficient with multiplication of 1-digit numbers. Furthermore, to deepen their understanding of multiplication facts, students are taught simple cases of multiplication between 2-digit numbers and 1-digit numbers. Pupils are expected to utilise their learning of the times table to solve problems.
The multiplication of 8 is introduced by a situation of 3 children with 8 cm tapes/ robbons.



Lesson Flow

INTRODUCTION

1 Review.

T/P Review key ideas learnt in the previous lesson.

2 Understand the picture or situation.

T Show the picture of 3 ribbons of 8cm belonging to 3 children.

T/P Discuss how they can find the total length of ribbon for the 3 children.

Lesson Flow

P Make suggestions based on their understanding from previous lesson on Multiplication table of 6-7.

TN Allow pupils to express their suggestions freely.

BODY

3 Introduce the main task.

T Introduce and explain the main task "Let's make the Multiplication Table of 8"

4 ① Multiplication with 8.

TN Read the word problem and let the pupils recognise that this lesson is on the multiplication table of 8, and find out the total length of ribbon needed to give to 3 children.

T "Children want to make ribbons for decoration. Each of them receives a piece of tape that is 8 cm long.
When we want to give pieces of ribbon to 3 children, how many cm of ribbon do we need?"

T ① Ask pupils to write a math expression for the problem.

P When we need 8 cm long tape for each child, for 3 children, the expression is 8×3.

T ② "Let's find the answer of this expression."

P Find the answer in various different ways to get the answer 24 cm using the following;
Count one by one. /Count by 2s. /Calculate by repeated addition.

5 ② Make the multiplication table of 8.

T Ask the pupils to think freely and make the multiplication table of 8 in their own way.

TN Advise pupils to utilize the increasing pattern in multiplication they have studied in the previous lessons like the multiplication table of 6-7.

P Identify the pattern of adding 8 each time to get the next number and complete the multiplication table of 8 by filling in the answers to the expressions.

TN Advise pupils to utilise the learning from the previous lessons;

1) there is a rule and pattern for how numbers increase in multiplication; and
2) even when we switch a multiplier and a multiplicand, the answer remains the same (the commutative law of multiplication).
3) manipulate blocks to represent expressions of the times-table

TN If some pupils find out that they can decompose a multiplier and a multiplicand into smaller numbers, Teacher can introduce the idea to the entire class. (Only if necessary)

CONCLUSION

6 Summary.

T/P Summarise the lesson by confirming students' understanding of the main ideas of the lesson.

Sample Blackboard Plan

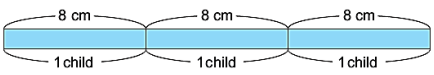
Date: **Chapter 12**: Multiplication (3) **Sub-chapter 3:** Multiplication Table of 8 **Lesson** 1 of 2

Main Task: "Let's make the Multiplication Table of 8"

Review

- Review key ideas with examples.
- We can use the multiplication table of 7 to write multiplication sentences, draw pictures and solve problems.

Activities



1 Each child receives a tape that is 8cm long. How many cm is needed for 3 children?

multiplier multiplicand

① **Expression:** **8** x 3

② **Answer:** **24** cm

② Let's make multiplication table of 7

8×1=	8
8×2=	16
8×3=	24
8×4=	32
8×5=	40
8×6=	48
8×7=	56
8×8=	64
8×9=	72

The answer increases by 8 when the multiplicand increases by 1.

The answer to 8 x 3 is the same as 3 x 8.

Summary

In the multiplication table of 8, when the multiplicand increases by 1, the answer increases by 8.

Unit 12

Unit: Multiplication (3)
Sub-unit: 3. The Multiplication Table of 8
Lesson 2 of 2

Textbook Page : p.151
Actual Lesson 108

Lesson Objectives

- To learn about how to recite the multiplication table of 8 and practice.
- To solve math problems using the multiplication table of 8.

Prior Knowledge

- Multiplication tables 2-7.

Preparation

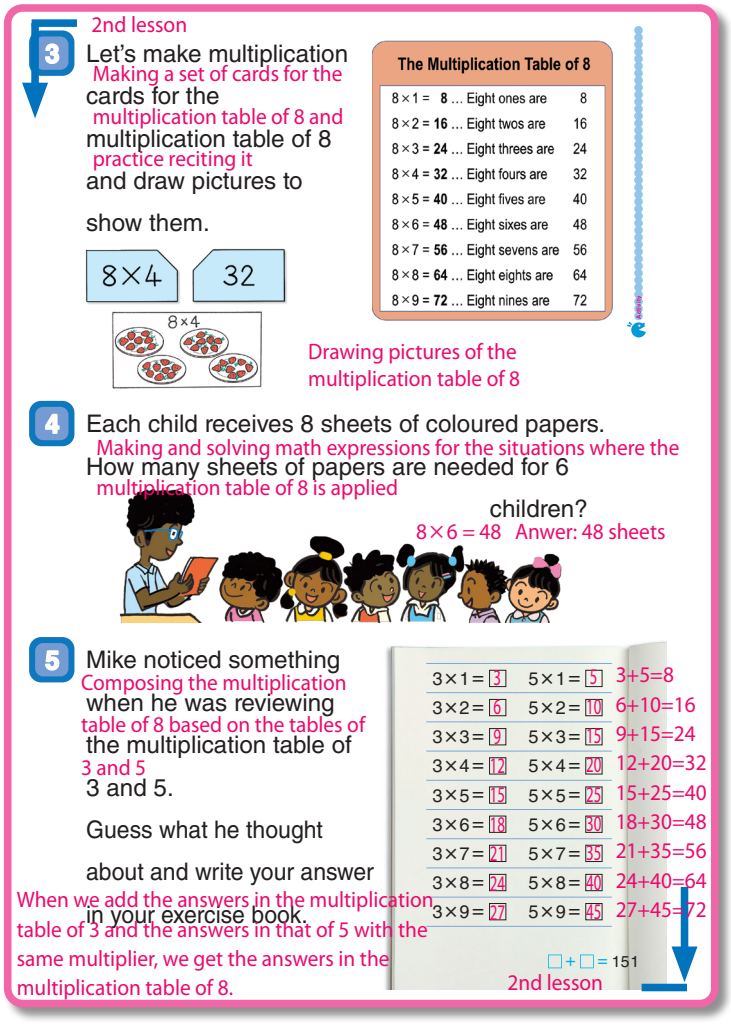
- Cardboard, drawing paper, the multiplication table of 8 and digital textbook software (if available).

Assessment

- Make the multiplication cards of 8 times-table. F
- Solve math problems using the multiplication table of 8. F S

Teacher's Notes

When making the multiplication table cards as shown in the textbook, pupils are supposed to write 8×4 in the front and 32 at the back. Teacher should be careful the size of the numbers are not too small to recognise in order to deliver the lesson effectively.



Lesson Flow

INTRODUCTION

1 Review.

T/P Review key ideas learnt in the previous lesson.

BODY

2 Introduce the main task.

T Introduce and explain the main task, "Let's practice using the Multiplication Table of 8"

3 Recite the multiplication table of 8.

T "Practice saying the multiplication table of 7. Repeat after me."

T/P Eight ones is 8, eight twos is 16, eight threes is 24, eight fours is 32, eight fives is 40, eight sixes is 48, eight seven is 56, eight eights is 64, eight nine is 72

P Practice several times in the regular order.

T Tell the pupils to practice saying it from the back or change the order.

TN Encourage pupils to come up with the right answers regardless of the order.

Lesson Flow

4 **3** **Make a set of cards for the multiplication table of 8, and memorise it.**

T "Let's make the cards for the multiplication table of 8."

P Write on cardboard the multiplication table of 8.
Example: Front 8×4 (Expression)
Back 32 (Answer)

P Practice saying the answers at the back from the expressions in the front of the cards.

5 **Draw a picture representing the multiplication table of 8.**

T Get the pupils to draw pictures for the multiplication table of 8.

P Draw pictures for the multiplication table of 8 and share their work in pairs or in groups and check the expressions and the answers.

6 **4** **Solve the problem where the multiplication table of 8 is used.**

T "Each child receives 8 sheets of coloured paper. How many sheets of paper do we need if we want to give papers to 6 children?"

P 8 sheets for each child, for 6 children, so it is 8×6=48. Answer: 48 sheets

TN Confirm with pupils that the number of sheets of coloured paper given to each child is a multiplicand and that the number of children is a multiplier.

7 **5** **Decompose the multiplier 8 into 3 and 5.**

TN Ask pupils to examine the multiplication table of 3 and 5 to realise that they can decompose the multiplier 8 into 3 and 5.

T Let's take a look at the multiplication table of 3 and 5, and write down whatever you notice in your exercise books.

P Realise that when adding the answers in the multiplication table of 3 and the answers in that of 5 with the same multiplier, they get the answers in the multiplication table of 8.

TN Prepare a table as shown below as a clue for pupils to realise this rule and confirm results.

	1	2	3	4	5	6	7	8	9
Multiplication table of 3	3	6	9	12	15	18	21	24	27
Multiplication table of 5	5	10	15	20	25	30	35	40	45
Multiplication table of 8	8	16	24	32	40	48	56	64	72

CONCLUSION

8 **Summary.**

T/P Summarise the lesson by confirming students' understanding of the main ideas of the lesson.

Sample Blackboard Plan

Date: **Chapter 12**: Multiplication (3) **Sub-chapter 3:** Multiplication Table of 8 **Lesson** 2 of 2

Main Task: "Let's practice using the Multiplication Table of 8"

Review

- Review key ideas with examples.
- In the multiplication table of 8, when the multiplicand increase by 1, the answer increases by 8.

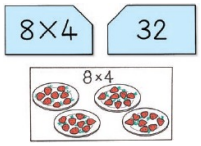
Activities

Recite the multiplication table of 8.

The Multiplication Table of 8

8 x 1 = **8** ... Eight ones are	8
8 x 2 = **16** ... Eight twos are	16
8 x 3 = **24** ... Eight threes are	24
8 x 4 = **32** ... Eight fours are	32
8 x 5 = **40** ... Eight fives are	40
8 x 6 = **48** ... Eight sixes are	48
8 x 7 = **56** ... Eight sevens are	56
8 x 8 = **64** ... Eight eights are	64
8 x 9 = **72** ... Eight nines are	72

3 Make a set of cards for the multiplication table of 8 and draw pictures.



	1	2	3	4	5	6	7	8	9
Multiplication table of 3	3	6	9	12	15	18	21	24	27
Multiplication table of 5	5	10	15	20	25	30	35	40	45
Multiplication table of 8	8	16	24	32	40	48	56	64	72

When adding the answers in the multiplication table of 3 and the answers in that of 5 with the same multiplicand, they get the answers in the multiplication table of 8.

4 Each child receives 8 sheets of coloured paper. How many sheets of paper do we need if we want to give papers to 6 children?"

Answer: 48 sheets

5 What did Mic notice while reviewing the 3 and 5 times tables?.

Decomposing the multiplier 8 and adding the answers of those with the same multiplicand in the table of 3 and 5.

Summary

We can use the multiplication table of 8 to write multiplication sentences, draw pictures and solve problems.

Unit 12

Unit: Multiplication (3)
Sub-unit: 4. The Multiplication Table of 9
Lesson 1 of 2

Textbook Page : p.152
Actual Lesson 109

Sub-unit Objectives

- To recognise situations and word problems of multiplication with a multiplier 9 and solve them to find the answers.
- To make a multiplication table of 9 and memorise it.

Lesson Objectives

- To recognise situations and word problems of multiplication with a multiplier 9 and solve them to find the answers.
- To make a multiplication table of 9 and memorise it.

Prior Knowledge

- Multiplication tables 2-8.

Preparation

- Picture of a baseball team with 9 players, 9 sets of 9 blocks (sets of magnetic blocks for posting on the blackboard), sets of blocks for pupils' use and digital textbook software (if available).



1st lesson

The Multiplication Table of 9

Situations where multiplication is used

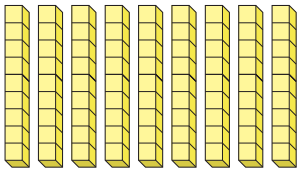
1 A softball team has 9 players.

How many players are there in 4 teams?

1. Let's write a multiplication expression. 9×4
2. Let's find the answer. Answer: 36 players

Composition of the multiplication table of 9

2 Let's make a multiplication table of 9 by using what you have learned and the rule of multiplication.



$9 \times 1 =$	9
$9 \times 2 =$	18
$9 \times 3 =$	27
$9 \times 4 =$	36
$9 \times 5 =$	45
$9 \times 6 =$	54
$9 \times 7 =$	63
$9 \times 8 =$	72
$9 \times 9 =$	81



We can find answers from what we have already learned, except 9×1 and 9×9.

When the multiplicand increases by 1, the answer is...



The answer increases by 9.

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1st lesson

Assessment

- Make the multiplication table of 8 through problem solving. F
- Demonstrate understanding that when the multiplier increases by 1, the answer increases by the amount of the multiplicand 9. F
- Understand the commutative law of multiplication. F S

Teacher's Notes

Teacher can introduce to pupils a unique way of finding the answers in the multiplication table of 9 by using 10 fingers. Pupils can use this way when they forget the answers.
(Pupils open their both hands. When a multiplier is 1, they fold the 1st finger from the left. When a multiplier is 3, they fold the 3rd finger from the left.)
When we look at the number of fingers on the right and left side of the folded finger, the number of fingers on its left indicates the number in the tens place of the answer, and the number of fingers on its right indicates the number in the ones place.



Lesson Flow

INTRODUCTION

1 Review.

T/P Review key ideas learnt in the previous lesson.

2 Understand the picture or situation.

T Show the picture of 9 children in a baseball team.

T/P Discuss how they can find the total number of children in 4 teams.

P Make suggestions based on their understanding from previous lesson on Multiplication table of 6-8.

TN Allow pupils to express their suggestions freely.

BODY

3 Introduce the main task.

T Introduce and explain the main task "Let's make the Multiplication Table of 9"

4 ① Multiplication with 9.

T/P Read the word problem to recognise that this lesson is on the multiplication table of 9, and find out the total children in 4 teams.

T ① Ask the pupils to write a math expression for the story problem.

P When there are 9 players in each team, for 4 teams, the expression is 9×4

T ② "Let's find the answer of this expression."

P Find the answer in various ways.
However, the answer should be 36 players.

5 ② Make the multiplication table of 9.

T Ask the pupils to think freely and make the multiplication table of 9.

TN Advise pupils to utilise the learning from the previous lessons.

P Realise the rule and pattern of how the answer increases by 9 when the multiplicand increases by 1 and complete the table of 9.

6 Important points in the lesson

T Ask pupils to present what they have done and explain the rules of multiplication.

P In the multiplication table of 9, when a multiplicand increases by 1, the answer increases by 9.

P Understand that in 9×3 and 3×9, the answers remain the same even when the multipliers and the multiplicands are switched.

CONCLUSION

7 Summary.

T/P Summarise the lesson by confirming students' understanding of the main ideas of the lesson.

Sample Blackboard Plan

Date: **Chapter 12**: Multiplication (3) **Sub-chapter 4:** Multiplication Table of 9 **Lesson** 1 of 2

Main Task: "Let's make the Multiplication Table of 9"

Review

- Review key ideas with examples.
- We can use the multiplication table of 8 to write multiplication sentences, draw pictures and solve problems.

Activities



1 A baseball team has 9 players? How many players are there in 4 teams?

multiplier multiplicand

1 **Expression:** 9 x 4

2 **Answer:** 36 players

2 Let's make multiplication table of 7

$9 \times 1 = 9$
$9 \times 2 = 18$
$9 \times 3 = 27$
$9 \times 4 = 36$
$9 \times 5 = 45$
$9 \times 6 = 54$
$9 \times 7 = 63$
$9 \times 8 = 72$
$9 \times 9 = 81$

The answer increases by 9 when the multiplicand increases by 1.

The answer to 9 x 4 is the same as 4 x 9.

Summary

In the multiplication table of 9, when the multiplicand increases by 1, the answer increases by 9.

Unit 12

Unit: Multiplication (3)
Sub-unit: 4. The Multiplication Table of 9
Lesson 2 of 2

Textbook Page : p.153
Actual Lesson 110

- To learn about how to recite the multiplication table of 9 and practice.
- To make math word problems using the multiplication table of 9 and solve them.

Prior Knowledge

- Multiplication tables 2-8.

Preparation

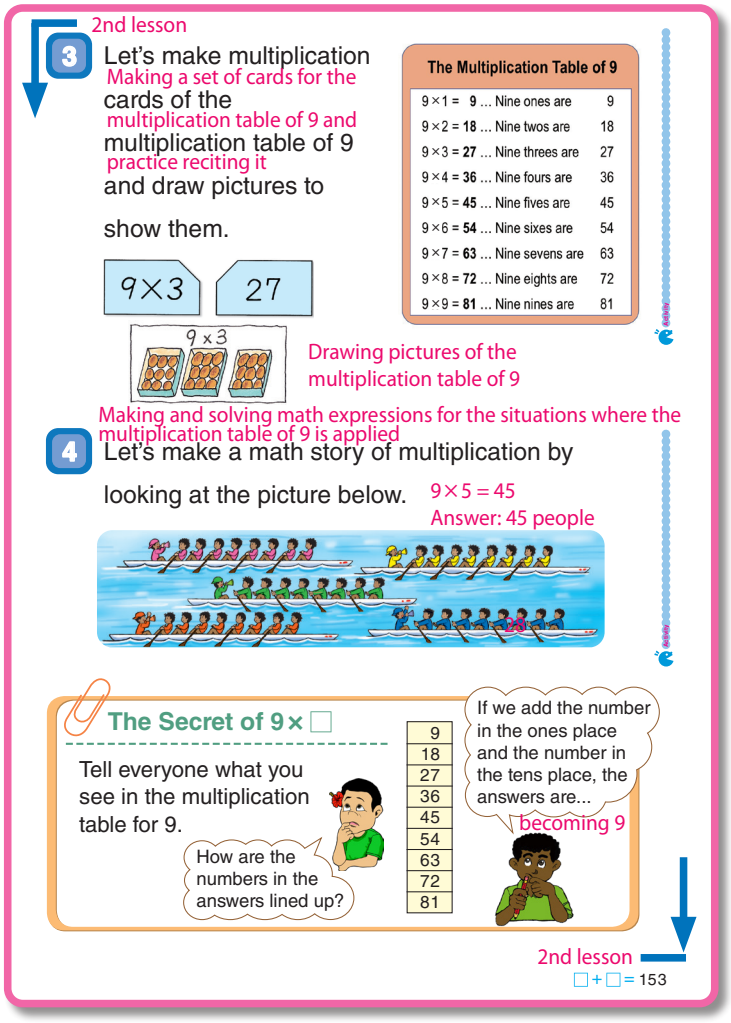
- Cardboard, drawing paper, the multiplication table of 9 and digital textbook software (if available).

Assessment

- Make multiplication cards of 9 times-table. F
- Make and solve math problems using the multiplication table of 9. F S

Teacher's Notes

In this lesson, the multiplication table of 9 is taught, and it is important that students become proficient with multiplication of 1-digit numbers. To deepen their understanding of multiplication facts, students are taught simple cases of multiplication between 2-digit numbers and 1-digit numbers.
Pupils are expected to utilise their learning of the times table to solve problems



Lesson Flow

INTRODUCTION

1 Review.

T/P Review key ideas learnt in the previous lesson.

BODY

2 Introduce the main task.

T Introduce and explain the main task "Let's practice using the Multiplication Table of 8"

3 Recite the multiplication table of 9.

P Practice several times in the regular order.

T Tell the pupils to practice saying it from the back or change the order.

TN Encourage pupils to come up with the right answers regardless of the order.

4 3 Make a set of cards for the multiplication table of 9, and memorise it.

T "Let's make the cards for the multiplication table of 9".

P Write on cardboard the multiplication table of 9.
Example: Front 9×3 (Expression)
Back 27 (Answer)

Lesson Flow

P Practice saying the answers at the back from the expressions in the front of the cards.

5 Draw a picture representing the multiplication table of 8.

T Ask the pupils to draw pictures for the multiplication table of 9.

P Draw pictures for the multiplication table of 9 and share their work in pairs or in groups and check the expressions and the answers.

6 4 Make word problems and solve the problem where the multiplication table of 9 is used.

T Ask pupils to look at the picture of boats on p.153 and make math word problems and solve them

P Make word problems and solve them using the expression 9×5.

P There are 9 people on each canoe, and 5 canoes, so it is 9×5=45. Answer: 45 people

TN Confirm with pupils that the number of people on each boat is a multiplier and that the number of boats is the multiplicand.

7 Find patterns in the 9 times table.

T Look at the multiplication table of 9 and present what you notice.

P Expected Answers;

1. When we add numbers in the ones place and the tens place, we always get 9.
2. When we look at the answers from the top to the bottom, the numbers in the ones place decreases by 1s from 9 to 1.
3. When we look at the answers from the top to the bottom, the numbers in the tens place increases by 1s from 1 to 8.

TN Pupils should be able to identify and enjoy the interesting patterns found in the multiplication table of 9.

CONCLUSION

8 Summary.

T/P Summarise the lesson by confirming students' understanding of the main ideas of the lesson.

Sample Blackboard Plan

Date: **Chapter 12**: Multiplication (3) **Sub-chapter 4:** Multiplication Table of 9 **Lesson** 2 of 2

Main Task: "Let's practice using the Multiplication Table of 9"

Review

- Review key ideas with examples.
- In the multiplication table of 9, when the multiplicand increase by 1, the answer increases by 9.

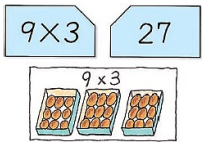
Activities

Recite the multiplication table of 9.

The Multiplication Table of 9

9 x 1 = 9 ... Nine ones are	9
9 x 2 = 18 ... Nine twos are	18
9 x 3 = 27 ... Nine threes are	27
9 x 4 = 36 ... Nine fours are	36
9 x 5 = 45 ... Nine fives are	45
9 x 6 = 54 ... Nine sixes are	54
9 x 7 = 63 ... Nine sevens are	63
9 x 8 = 72 ... Nine eights are	72
9 x 9 = 81 ... Nine nines are	81

3 Make a set of cards for the multiplication table of 9 and draw pictures.



4 Make a math story about the picture.



There are 9 people on each canoe and there are 5 canoes, so it is 9 × 5 = 45.

Answer: 45 people

Can you see some patterns in the answers of the 9 times table?

9	0+9=9
18	1+8=9
27	2+7=9
36	3+6=9
45	4+5=9
54	5+4=9
63	6+3=9
72	7+2=9
81	8+1=9

- When we add numbers in the ones place and the tens place, we always get 9.
- The numbers in the ones place decreases by 1s from 9 to 1.
- The numbers in the tens place increases by 1s from 0 to 8.

Summary

We can use the multiplication table of 9 to write multiplication sentences, draw pictures and solve problems.

Unit 12

Unit: Multiplication (3)
Sub-unit: 5. The Multiplication Table of 1
Lesson 1 of 2

Textbook Page : p.154
Actual Lesson 111

Sub-unit Objectives

- To recognise situations and word problems of multiplication with a multiplier 1 and solve them to find the answers.
- To make a multiplication table of 1 and memorise it.

Lesson Objectives

- 1 To identify the number of pieces of cake to be given to 4 people by referring to how the numbers of candies and oranges are calculated on p.154.
- To make the multiplication table of 1.

Prior Knowledge

- Meaning of multiplication

Preparation

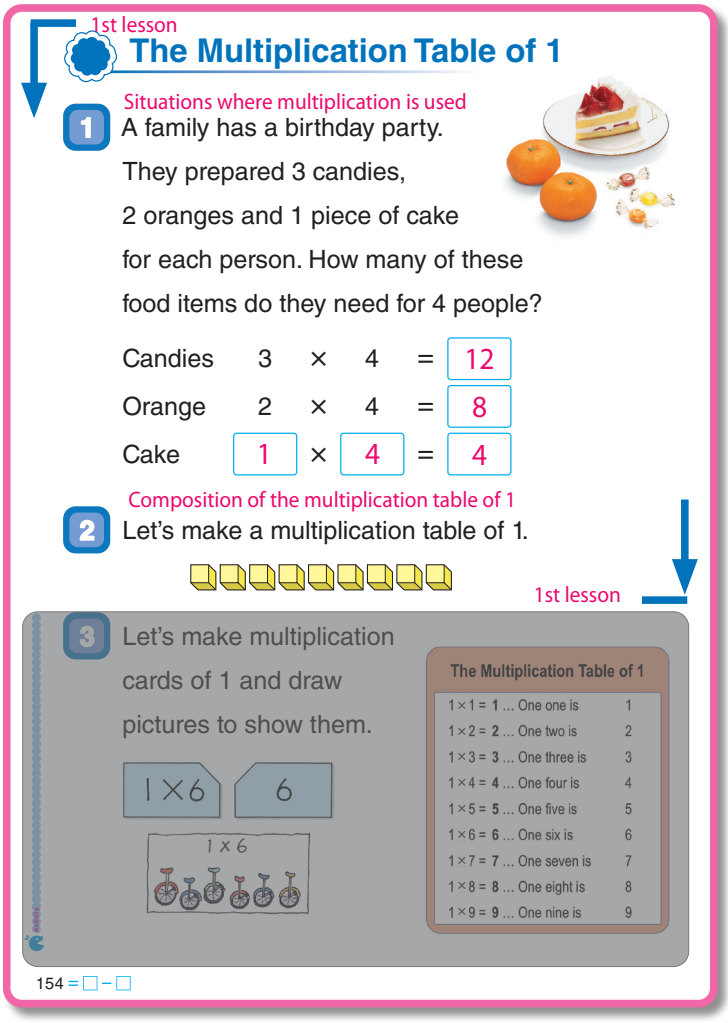
- Pictures of candies, oranges and pieces of cake, mathematics blocks (for Teacher's demonstration and for pupils' use) and digital textbook software (if available).

Assessment

- Make and solve math problems of multiplication with multiplicand of 1. F S
- Make multiplication cards of 1 times-table. F S

Teacher's Notes

In this lesson, the multiplication table of 1 is taught, and it is important that students become proficient with multiplication of 1-digit numbers. Furthermore, to deepen their understanding of multiplication facts, students are taught simple cases of multiplication between 2-digit numbers and 1-digit numbers. Pupils will make the multiplication table of 1 by checking the answers with the mathematics blocks. Pupils should learn that as the multiplier increases by 1, the answer also increases by 1. This can be observed when 1 block is being added to the previous set.


1st lesson

The Multiplication Table of 1

Situations where multiplication is used

1 A family has a birthday party. They prepared 3 candies, 2 oranges and 1 piece of cake for each person. How many of these food items do they need for 4 people?

Candies 3 × 4 = 12

Orange 2 × 4 = 8

Cake 1 × 4 = 4

Composition of the multiplication table of 1

2 Let's make a multiplication table of 1.

1st lesson

3 Let's make multiplication cards of 1 and draw pictures to show them.

1×6 6

1 x 6

The Multiplication Table of 1

1×1 = 1 ... One one is	1
1×2 = 2 ... One two is	2
1×3 = 3 ... One three is	3
1×4 = 4 ... One four is	4
1×5 = 5 ... One five is	5
1×6 = 6 ... One six is	6
1×7 = 7 ... One seven is	7
1×8 = 8 ... One eight is	8
1×9 = 9 ... One nine is	9

154 = □ – □

Lesson Flow

INTRODUCTION

1 Review.

T/P Review key ideas learnt in the previous lesson.

2 Understand the picture or situation.

T Show the picture and word problem and get the students to try and understand the situation.

T/P Discuss how they can solve the problem.

TN Allow pupils to express their suggestions freely.

BODY

3 Introduce the main task.

T Introduce and explain the main task "Let's make the Multiplication Table of 1"

4 1 Solve the problem to find the number of items.

T "We prepare 3 candies, 2 oranges and 1 piece of cake for each person.
How many of these things do we need if we want to give to 4 people?"

P Expected responses;

1. 3×4=12 candies
2. 2×4=8 oranges
3. 1×4=4 pieces of cake

5 2 Make the multiplication table of 1.

T Ask the pupils to think freely and make the multiplication table of 1.

TN Pupils make the multiplication table of 1 by checking the answers with the mathematics blocks. They should learn that as the multiplicand increases by 1, the answer also increases by 1. This can be observed when 1 block is being added to the previous set.

P Review the rules and patterns found in the multiplication table from 2 to 9.

P Identify the pattern of adding 1 each time to get the next answers.

CONCLUSION

6 Summary.

T/P Summarise the lesson by confirming students' understanding of the main ideas of the lesson.

Sample Blackboard Plan

Date: **Chapter 12**: Multiplication (3) **Sub-chapter 5:** Multiplication Table of 1 **Lesson** 1 of 2

Main Task: "Let's make the Multiplication Table of 1"

Review

- Review key ideas with examples.
- We can use the multiplication table of 9 to write multiplication sentences, draw pictures and solve problems.

Activities



For 1 person.

1 How many do they need for 4 people?

candy 3 x 4 = 12 candies
Orange 2 x 4 = 8 oranges
Cake 1 x 4 = 4 pieces of cake

2 Let's make multiplication table of 1



Multiplication table of 1
1 x 1 = 1
1 x 2 = 2
1 x 3 = 3
1 x 4 = 4
1 x 5 = 5
1 x 6 = 6
1 x 7 = 7
1 x 8 = 8
1 x 9 = 9

The answer increases by 1 when the multiplicand increases by 1.

Summary

In the multiplication table of 1, when the multiplicand increases by 1, the answer increases by 1.

Unit 12

Unit: Multiplication (3)
Sub-unit: 5. The Multiplication Table of 1
Lesson 2 of 2

Textbook Page : p.154
Actual Lesson 112

Sub-unit Objectives

- To recognise situations and word problems of multiplication with a multiplicand 1 and solve them to find the answers.
- To make a multiplication table of 1 and memorise it.

Lesson Objectives

- To learn about how to recite the multiplication table of 1 and practice.
- To describe the scenes in a picture to which the multiplication table of 1 is applied.

Prior Knowledge

- Meaning of multiplication

Preparation

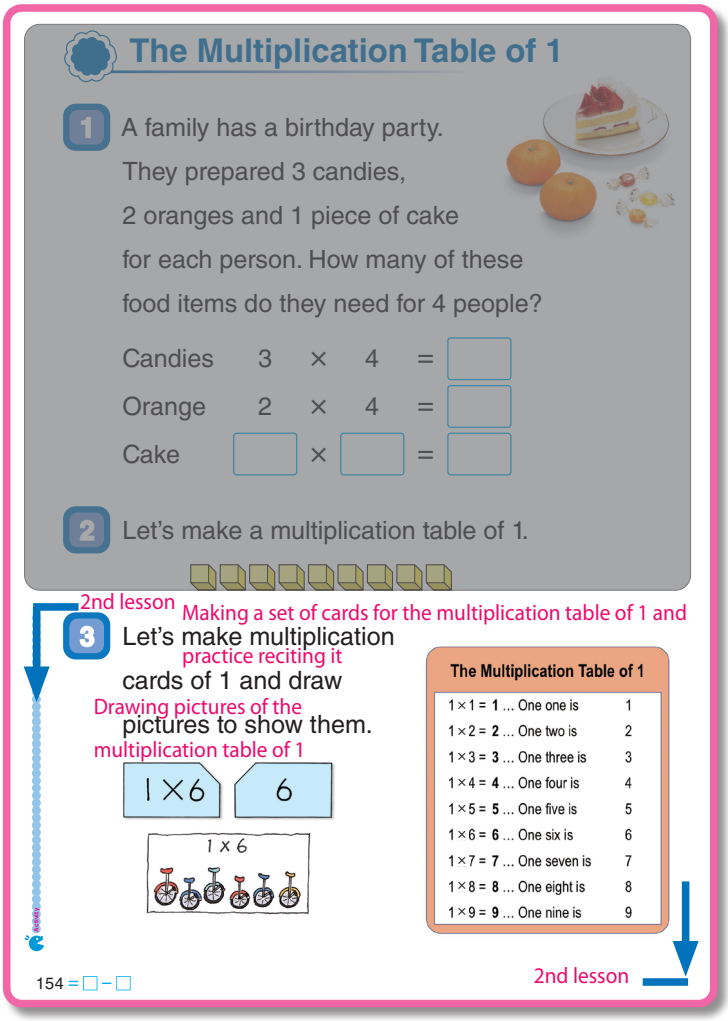
- Cardboard, drawing paper, the multiplication table of 9 and digital textbook software (if available).

Assessment

- Make multiplication cards of 1 times-table. F
- Draw pictures to describe the scenes in a picture to which the multiplication table of 1 is applied. F S

Teacher's Notes

When making the multiplication table cards as shown in the textbook, pupils are supposed to write 1×6 in the front and 6 at the back. Teacher should be careful the size of the numbers are not too small to recognise in order to deliver the lesson smoothly,



Lesson Flow

INTRODUCTION

1 Review.

T/P Review key ideas learnt in the previous lesson.

BODY

2 Introduce the main task.

T Introduce and explain the main task "Let's remember the Multiplication Table of 1"

3 3 Make a set of cards for the multiplication table of 1, and memorise it.

T "Let's make the cards for the multiplication table of 1".

P Write on cardboard the multiplication table of 1.
Example: Front 1 × 6 (Expression)
Back 6 (Answer)

P Practice saying the answers at the back from the expressions in the front of the cards.

4 Draw pictures for the multiplication table of 1.

T Ask the pupils to draw pictures for the multiplication table of 1.

P Draw pictures for the multiplication table of 1 and share their work in pairs or in groups and check the expressions and the answers.

5 Identify Patterns.

T Get students to identify any patterns from the times table of 1.

P Realise that in the multiplication table of 1, the multiplicand and the answer are the same number.

CONCLUSION

6 Summary.

T/P Summarise the lesson by confirming students' understanding of the main ideas of the lesson.

Sample Blackboard Plan

Date: **Chapter 12**: Multiplication (3) **Sub-chapter 5:** Multiplication Table of 1 **Lesson** 2 of 2

Main Task: "Let's practice using the Multiplication Table of 1"

Review

- Review key ideas with examples.
- In the multiplication table of 1, when the multiplicand increase by 1, the answer increases by 1.

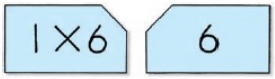
Activities

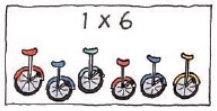
Recite the multiplication table of 1.

The Multiplication Table of 1

1 x 1 = **1** ... One one is	1
1 x 2 = **2** ... One two is	2
1 x 3 = **3** ... One three is	3
1 x 4 = **4** ... One four is	4
1 x 5 = **5** ... One five is	5
1 x 6 = **6** ... One six is	6
1 x 7 = **7** ... One seven is	7
1 x 8 = **8** ... One eight is	8
1 x 9 = **9** ... One nine is	9

3 Make a set of cards for the multiplication table of 1 and draw pictures.





Can you see some patterns in the answers of the 9 times table?

- The multiplicand and the answer are the same number

Summary

- We can use the multiplication table of 1 to write multiplication sentences, draw pictures and solve problems.
- In the multiplication table of 1, the multiplicand and the answer are the same number.

Unit 12

Unit: Multiplication (3)
Sub-unit: 6. What Kind of Calculation Is This?
Lesson 1 of 1

Textbook Page : p.155
Actual Lesson 113

Sub-unit Objectives

- To examine the presented problems and choose the appropriate calculation from addition, subtraction or multiplication. To further deepen the understanding of multiplication.

Lesson Objectives

- To read and understand the contexts of the presented word problems, and identify the appropriate calculation from addition, subtraction or multiplication.
- To manipulate concrete objects such as the mathematics blocks to understand the contexts of the presented word problems, and explain how to solve the problems using pictures, charts, math expressions, numbers and words.

Prior Knowledge

- Multiplication Tables 2 to 9.

1st lesson

What Kind of Calculation is This?



Situations where multiplication is used

1 There are 8 strawberries on each plate. There are 3 plates. 8×3 = 24 Answer: 24 strawberries

How many strawberries are there?



2 There are 9 doughnuts in the box.
Situations where subtraction is used
If you eat 7, how many are left?
9 - 7 = 2 Answer: 2 doughnuts

3 There are 9 oranges in the basket and 4 oranges on the plate.
Situations where addition is used

How many oranges are there?
9 + 4 = 13 Answer: 13 oranges

4 Pencils are given to 7 children. Each child receives 3 pencils.
Situations where multiplication is used

How many pencils are there in total?
3×7 = 21 Answer: 21 pencils

1st lesson
□+□=155

Preparation

- Mathematics blocks, enlarged picture from the textbook 155.

Assessment

- Understand the contexts of the word problems, and choose the appropriate calculation from addition, subtraction or multiplication to solve. F S

Teacher's Notes

In this lesson, pupils are expected to read and understand the contexts of the presented word problems, and choose the appropriate calculation from addition, subtraction or multiplication to further deepen the understanding of multiplication. They will need manipulate concrete objects such as the mathematics blocks to understand the contexts of the presented word problems, and explain how to solve the problems using pictures, charts, math expressions, numbers and words.

Lesson Flow

INTRODUCTION

1 Review.

T/P Review key ideas learnt in the previous lessons on times tables.

2 Understand the picture and situation.

T/P Study the picture and discuss the scene of the presented problem.

T "What do you see in the picture?"

P Expected responses:

- There are 7 children.
- There are 9 doughnuts in the box.
- There are 3 plates of strawberries.
- There are 2 boxes of pencils
- There are oranges in the basket and some are on a plate.

Lesson Flow

BODY

3 Introduce the main task.

T Introduce and explain the main task "Let's think about what kind of calculation to use."

4 1 Solve the word problem in which multiplication is used.

T "Let's find the total number of strawberries when there are 8 strawberries on each plate, for 3 dishes. Write a math expression and find the answer."

P 8 strawberries on each, for 3 plates. 8×3=24
Answer: 24 strawberries

5 2 Solve the word problem in which subtraction is used.

T "Let's find the number of doughnuts left when we eat 7 doughnuts from the original 9. Write a math expression and find the answer."

P 7 from 9, the remaining is 2 by calculating 9−7=2. Answer: 2 doughnuts

6 3 Solve the word problem in which addition is used.

T "Let's find the total number of oranges when 9 oranges are in the basket and 4 oranges are on the plate. Write a math expression and find the answer."

P The total number of oranges is 9+4=13.
Answer: 13 oranges

7 4 Solve the word problem in which multiplication is used.

T "Let's find the total number of pencils we need when we give 3 pencils to each child for 7 children in total. Write a math expression and find the answer."

P 3 pencils to each child, for 7 children, the total number of pencils is 3×7=21.
Answer: 21 pencils

TN Some pupils may make a mistake by saying "7×3=21" because the number 7 appears first in the word problem.
Teacher needs to clarify with pupils what the multiplicand and the multiplier are in this case.

CONCLUSION

8 Summary.

T/P Summarise the lesson by confirming students' understanding of the main ideas of the lesson.

Sample Blackboard Plan

Date: **Chapter 12**: Multiplication (3) **Sub-chapter 6:** What kind of calculation is this? **Lesson** 1 of 1

Main Task: "Let's think about what kind of calculation to use."

Review

- Review key ideas with examples.
- Recite the 6-9 times tables.

Activities



What do you see in the picture?

- There are 7 children.
- There are 9 doughnuts in the box.
- There are 3 plates of strawberries.
- There are 2 boxes of pencils
- There are oranges in the basket and some on a plate.

1 Multiplication

There are 8 strawberries on each, for 3 plates. 8 × 3 = 24
Answer: 24 strawberries

2 Subtraction

Because we ate 7 from 9, the remaining is 2 by calculating 9 – 7 = 2.

Answer: 2 doughnuts

3 Addition

Because we add 9 and 4, the total number of oranges is 9 + 4 = 13.

Answer: 13 oranges

4 Multiplication

Because we give 3 pencils to each child, for 7 children, the total number of pencils is 3 × 7 = 21.

Answer: 21 pencils

Summary

- Multiplication like addition and subtraction is useful for solving problems.

Unit 12

Unit: Multiplication (3)
Exercise
Lesson 1 of 1

Textbook Page : p.156
Actual Lesson 114

Lesson Objectives

- To review what has been learnt in the chapter.

Prior Knowledge

- All content learnt in the chapter

Preparation

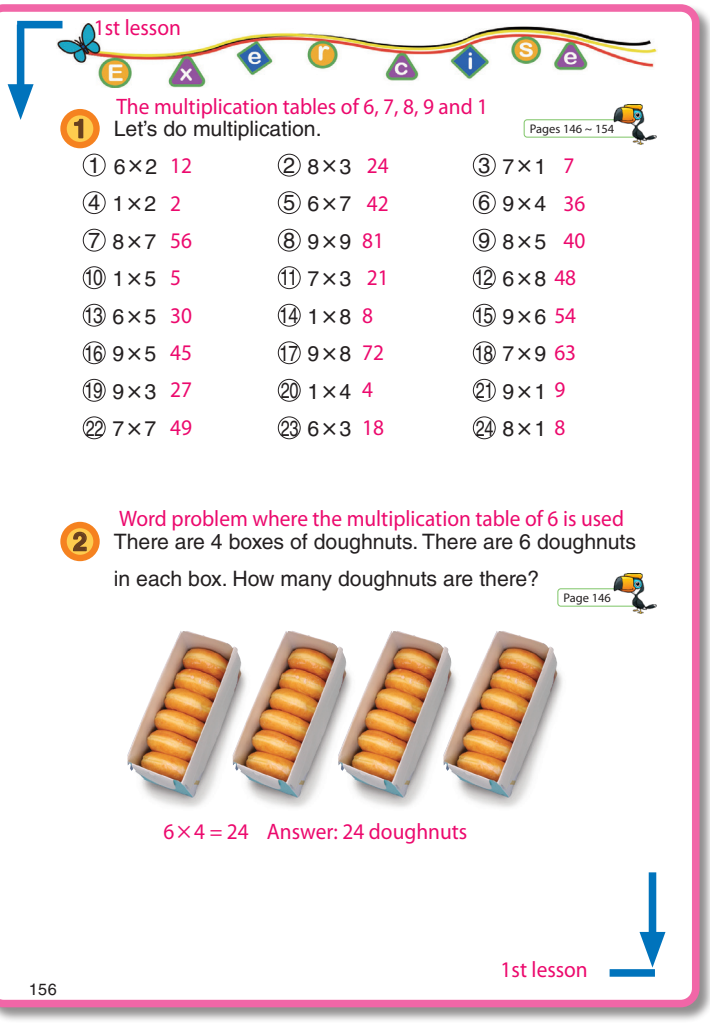
- Worksheet of the Exercise

Assessment

- Review what has been learnt in the chapter. S

Teacher's Notes

The exercises in this lesson focus mainly on reviewing the learning of the 6, 7, 8 and 9 times tables.



1st lesson

Exercise

1 The multiplication tables of 6, 7, 8, 9 and 1
Let's do multiplication.

Pages 146 ~ 154

① 6×2 12	② 8×3 24	③ 7×1 7
④ 1×2 2	⑤ 6×7 42	⑥ 9×4 36
⑦ 8×7 56	⑧ 9×9 81	⑨ 8×5 40
⑩ 1×5 5	⑪ 7×3 21	⑫ 6×8 48
⑬ 6×5 30	⑭ 1×8 8	⑮ 9×6 54
⑯ 9×5 45	⑰ 9×8 72	⑱ 7×9 63
⑲ 9×3 27	⑳ 1×4 4	㉑ 9×1 9
㉒ 7×7 49	㉓ 6×3 18	㉔ 8×1 8

2 Word problem where the multiplication table of 6 is used
There are 4 boxes of doughnuts. There are 6 doughnuts in each box. How many doughnuts are there?

Page 146

6×4 = 24 Answer: 24 doughnuts

1st lesson

156

Lesson Flow

EXERCISE

① Practice the multiplication table of 6, 7, 8, 9 and 1.

P Revise the 6, 7, 8, 9 and 1 times table.

T Let pupils write down the multiplication expressions in the problem ① on their notebooks and start solving each expression.

T/P Correct and confirm the answers.

② Solve the word problem.

T/P Read the word problem and understand it as a situation where the multiplication table of 6 is applied.

T Get the pupils to identify the number of doughnuts in each box, and for how many boxes.

P Write a math expression and solve it to find the answer.

Sample Blackboard Plan

Date: **Chapter 12**: Multiplication (3) **Sub-chapter: Exercise** **Lesson** 1 of 1

Exercise

① Let's do multiplication.

① 6×2 12	② 8×3 24	③ 7×1 7
④ 1×2 2	⑤ 6×7 42	⑥ 9×4 36
⑦ 8×7 56	⑧ 9×9 81	⑨ 8×5 40
⑩ 1×5 5	⑪ 7×3 21	⑫ 6×8 48
⑬ 6×5 30	⑭ 1×8 8	⑮ 9×6 54
⑯ 9×5 45	⑰ 9×8 72	⑱ 7×9 63
⑲ 9×3 27	⑳ 1×4 4	㉑ 9×1 9
㉒ 7×7 49	㉓ 6×3 18	㉔ 8×1 8

② How many doughnuts are there?



6 x 4 = 24 Answer: 24 doughnuts

Unit 12

Unit: Multiplication (3)
Problems 1 and 2
Lesson 1 of 1

Textbook Page : p.157~158
Actual Lesson 115

Lesson Objectives

- To review what has been learnt.
- To identify rules and patterns in the multiplication table.

Preparation

- Digital textbook software (if available).

Assessment

- Review what has been learnt in the chapte. F S

Teacher's Notes

Toward the end of this unit "Multiplication (3)", pupils should be given opportunities to link multiplication with their daily lives through the activity of finding multiplication around themselves.
The examples would include the following;
① Cakes in a box-5 rows of cakes with each row having 4 cakes.
② Mangoes in a basket - 5 baskets of mangoes with each basket having 3 mangoes.
③ Cars-6 cars with each car having 4 people
④ Petals of a flower - 3 flowers with each having 8 petals
Places to be explored do not have to be only inside the classroom but can be the entire school or pupils' home environment.
Through such activities, pupils should be able to recognise that there are various scenes of multiplication in their daily lives.

For Problems 1 and 2, Problem 1 can be given to pupils as homework and checked quickly during the lesson while Problem 2 can be done during the lesson for pupils' problem-solving practices.

1st lesson

Problems 1

The multiplication tables of 6, 7, 8, 9 and 1

1 Let's do multiplication.

① 6×6 36	② 1×3 3	③ 8×4 32
④ 9×2 18	⑤ 7×5 35	⑥ 6×1 6
⑦ 1×7 7	⑧ 6×9 54	⑨ 8×9 72
⑩ 8×6 48	⑪ 9×7 63	⑫ 7×8 56

2 We bought 8 bags of oranges. There are 5 oranges in each bag.
Word problem where the multiplication table of 5 is used

How many oranges are there?

① Let's draw a diagram.

② Let's write an expression and find the answer.

5×8 = 40 Answer: 40 oranges

3 Let's find an easier way to calculate the number of ●.

①



Eg.
8×2 + 7 = 23
5×3 + 4×2 = 23
3×7 +2 = 23 Answer 23 dots

②



Eg.
4×4 + 3×3= 25
7×3 + 4 = 25
4×7 - 3 = 25
Answer: 25 dots

4 Let's make a math story for 7×3 by using "cookie" and "plate".



Eg.
There are 7 cookies on each plate. There are 3 plates. How many cookies are there altogether?

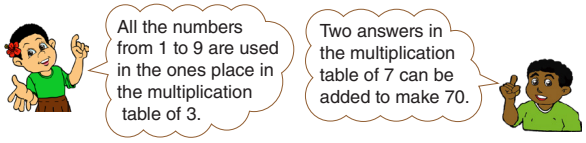
Problems 2

Rule of the multiplication

1 Rie and her friends are looking at the multiplication tables of 3 and 7, and are talking about them.

3×1=3	7×1=7
3×2=6	7×2=14
3×3=9	7×3=21
3×4=12	7×4=28
3×5=15	7×5=35
3×6=18	7×6=42
3×7=21	7×7=49
3×8=24	7×8=56
3×9=27	7×9=63

① Kila and Wesley noticed something. What did they notice? Guess what they thought about and write your ideas in your exercise book.



② Gibson said, "I can understand the multiplication table of 10 by looking at the multiplication tables above".
What did he notice? Write your ideas in your exercise book.

1st lesson

157 158

Lesson Flow

PROBLEMS 1

1. Practice the multiplication table of 6, 7, 8, 9 and 1.

TN Check whether pupils are solving the problems without difficulty.

2. Read the word problem and recognise that it is the scene where the multiplication table of 5 is applied.
   Pupils then write a math expression and solve it to find the answer.

TN ① Check whether pupils have drawn a picture that has 8 bags of 5 oranges each.
② Check whether pupils have written an expression, (the number of oranges in a bag) × (the number of bags).

3. Calculate the number of dots by using multiplication.

TN Tell pupils to think about how to group the dots and circle each group by drawing lines and write a math expression and solve it to find the answer.

4. Make a math story of multiplication.

TN Checks each individual's work to see whether the word problem made is appropriate for the 7×3 situation.

PROBLEMS 2

1. Study the multiplication table of 3 and 7 to identify anything interesting.

TN ① Check whether pupils have identified numbers 1-9 in the ones place.
Check if pupils have identified the two answers that can be added to have the sum of 70 in the 7 times table.
② Check if pupils can be able to identify that the sums of the answers of both tables give the answers of the 10 times table.

Sample Blackboard Plan

Date: **Chapter 12**: Multiplication (3) **Sub-chapter: Problems** **Lesson** 1 of 1

Problems 1

1. Let's do multiplication.

① 6×6 36	② 1×3 3	③ 8×4 32
④ 9×2 18	⑤ 7×5 35	⑥ 6×1 6
⑦ 1×7 7	⑧ 6×9 54	⑨ 8×9 72
⑩ 8×6 48	⑪ 9×7 63	⑫ 7×8 56

2. We bought 8 bags of oranges. There are 5 oranges in each bag.
   How many oranges are there?
   ① Let's draw a diagram.
   ② Let's write an expression and find the answer.
   5 x 8 = 40 Answer: 40 oranges

3. Let's find an easier way to calculate the number of ●.

① 

Eg.
8 x 2 + 7 = 23
5 x 3 + 4 x 2 = 23
3 x 7 +2 = 23 Answer 23 dots

② 

Eg.
4 x 4 + 3 x 3 =25
7 x 3 +4 = 25
4 x 7 - 3 = 25
Answer: 25 dots

4. Let's make a math story for 7×3 by using "cookie" and "plate."



Eg.
There are 7 cookies on each plate. There are 3 plates. How many cookies are there altogether?

Problems 2

1. Discuss the questions about these two multiplication tables. .

3×1=3	7×1=7
3×2=6	7×2=14
3×3=9	7×3=21
3×4=12	7×4=28
3×5=15	7×5=35
3×6=18	7×6=42
3×7=21	7×7=49
3×8=24	7×8=56
3×9=27	7×9=63

End of Chapter Test: Chapter 12 **Date:**

Evaluation: Chapter 12 Multiplication (3)	Name:	Score /100

1. Do multiplications. [5 points for each question]

(1) $8 \times 5 =$ (2) $1 \times 6 =$ (3) $8 \times 6 =$ (4) $9 \times 7 =$

(5) $6 \times 5 =$ (6) $7 \times 8 =$ (7) $6 \times 9 =$ (8) $7 \times 2 =$

[10 points for math sentence and 10 points for answer]

2. You give 6 pens to 8 people. How many pens are needed in total?

Math sentence: _____ Answer: _____

3. One team consists of 7 players playing rugby. How many players are there in 8 teams?

Math sentence: _____ Answer: _____

4. There are 4 bags of candies. Each bag contains 8 candies. How many candies are there in total?

Math sentence: _____ Answer: _____

Chapter 13 Multiplication (4)

1. Unit Objectives

- To understand the meaning and the representations of numbers, and extend their ability to use numbers.
- To consider a number in relation to other numbers by regarding it as a product of other numbers.
- To understand the meaning of multiplication and use the calculation.
- To explore simple properties which hold for multiplication, and to make use of them for making the multiplication table up to 9 times 9 and for checking the results of calculations.
- To understand the multiplication table up to 9 times 9 and to multiply one digit numbers accurately.
- To explore ways of multiplication of a two digit number and a one digit number in simple cases.

2. Teaching Overview

In this unit, pupils will be aware of the rules of multiplication and further deepen their understanding of multiplication tables through the activities.
Pupils summarise the multiplication tables that they have learned so far and familiarise themselves with multiplication games. In addition, pupils think, express and present their ideas in many situations.

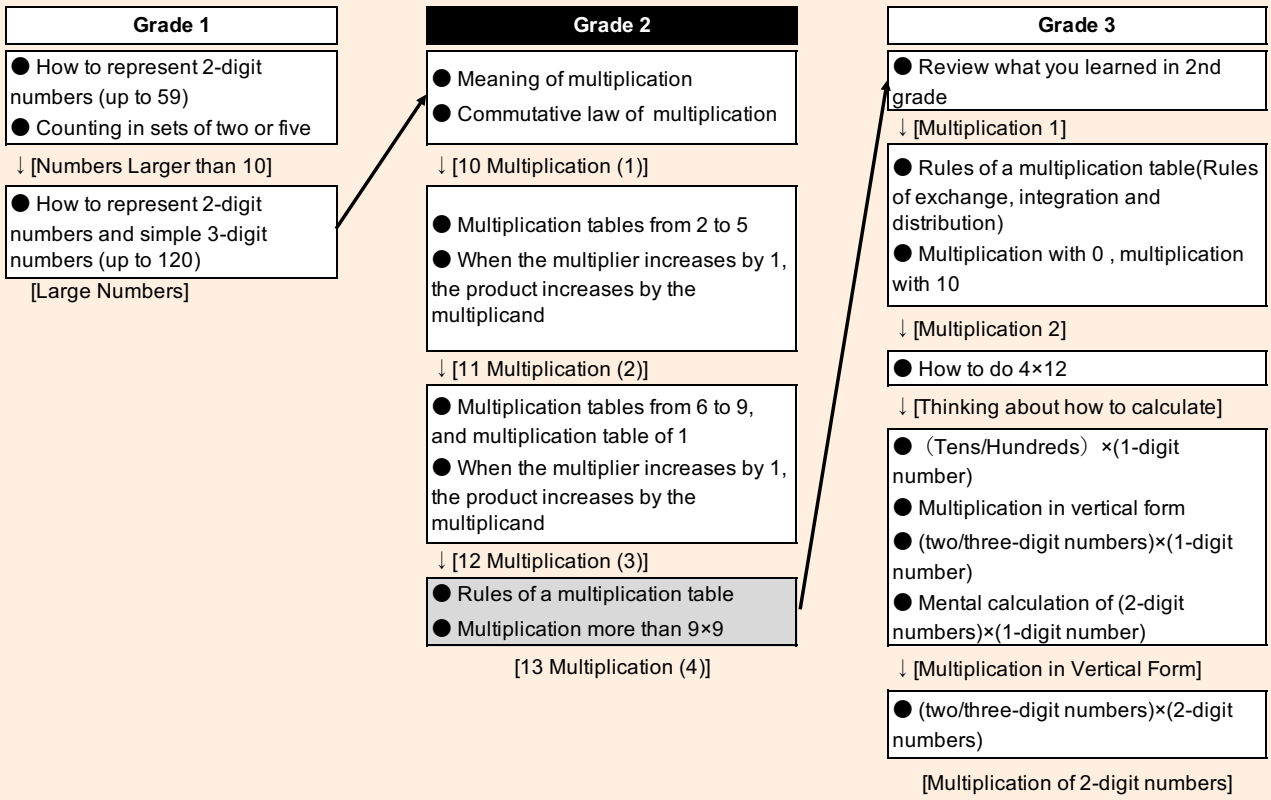
Multiplication Table: Through the creation of a multiplication table, pupils will be able to find the products of the multiplication table, notice the changes in the multiplication and the rules of the arrangement, and deepen their understanding of the multiplication table.

Multiplication Games: The aim is to deepen the understanding of previously learned items while enjoying the game.

Multiplication More Than 9×9: Pupils think about multiplication where the multiplier exceeds 9 and multiplicand where the multiplicand exceeds 9 based on the rules of multiplication that they have learned so far.

Key Concepts: Multiplication more than 9×9 and rules of multiplication.

3. Related Learning Contents



Unit 13

Unit: Multiplication (4)
Sub-unit: 1. Multiplication Table
Lesson 1 of 2

Textbook Page : p.159
Actual Lesson 116

Sub-unit Objectives

- To understand the structure of the multiplication table and make one.
- To recognize the relationships between multiplicands, multipliers and products based on the features of the multiplication table.
- To understand the commutative law of multiplication.

Lesson Objectives

- To understand the structure of the multiplication table and make one.

Prior Knowledge

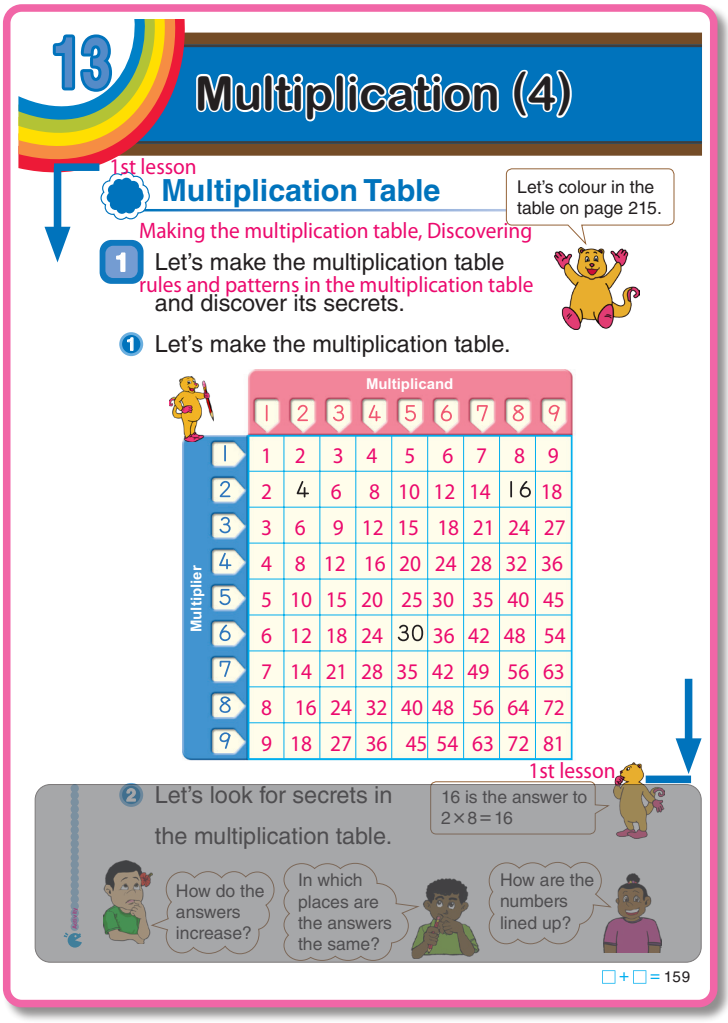
- Using the 3 and 7-times tables from Problems 2, the answers progress with addition of 3 and 7 as multipliers range from 1 to 9. When multiplication increases by 3, by how much does the answer increase?

Preparation

- String, elastic string, colored paper, copy paper, ruler

Assessment

- Study the structure of the multiplication table and make one complete one. F
- Find rules or patterns while colouring the complete multiplication table. F



Teacher's Notes

Hints on how we can identify simple patterns on the multiplication showing how the multiplicand, multiplier and the answers are related.



For example:
If you triple the answers of column 3, row by row, it will give you the answers of Multiplication table of 9 because when 3 is tripled it gives 9 (3+3+3=9) and if 6 is tripled it is 18 (6+6+6=18) and so on.

Lesson Flow

INTRODUCTION

1 Review.

T/P Review key ideas from the previous chapter.

BODY

2 Introduce the Main Task.

T Introduce and explain the main task, 'Let's make one complete multiplication table and look for patterns'.

3 1 Make the multiplication Table and discover its secrets.

T/P 1 Open to page 159 of the textbook and discuss the multiplication table.

P Discuss how they can make a complete multiplication table up to 9 times 9.

T Display the Multiplication Chart and ask pupils to explain how to get the products 4, 30 and 16.

P 4 is 2×2, 30 is 6×5 and 16 is 2×8

T Ask the pupils to write down only the answers to the multiplication table using easier ways or patterns to complete the multiplication table starting from the column of 1 first.
Then column of 2, 3, 5 and so on.

P Fill up all the columns with answers using the products 4, 16 and 30 as hints.

4 Colour the multiplication table and find rules or patterns.

T/P Open to page 159 of the textbook and explain how to colour the answers on the multiplication table.

P Colour the answers of the Multiplication table from 1 to 9, using 9 different colours

TN Once all the answers are filled up to make one complete multiplication table, pupils select individual colours for the column of 1 answers of the 1 times table first, then 2 times table until all columns are coloured.

T Ask the pupils to find some patterns, or rules (secrets) while colouring the table.

P Use what they know about 1's to find the patterns;Patterns or Rules:

1) In row 4, the answer of 4 of the 1 times table when added to answer of 8 for the 2 times table, it gives the answer 12 for the 3 times table. (4+8=12)

2) If you double the answers of column 2, row by row, it will give you the answers of the Multiplication table of 4, when 2 is doubled it gives 4 (2+2=4), 4 doubled is 8 (4+4=8) and so on.

T/P Confirm their findings and the structure of the Multiplication Table.

CONCLUSION

5 Su mary.

T/P Summarise the lesson by confirming pupils' understanding of the main ideas in the lesson.

Sample Blackboard Plan

Date: **Chapter 13:** Multiplication (4) **Sub-Chapter 1:** Multiplication Table **Lesson Number**: 1/2

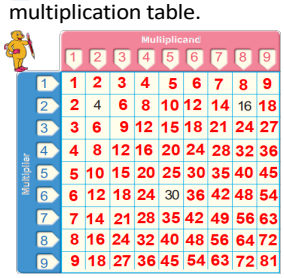
Main Task: Let's make one complete multiplication table and look for patterns.

Review

① Say the multiplication table from 1 to 9 and think about how to make one complete multiplication table.

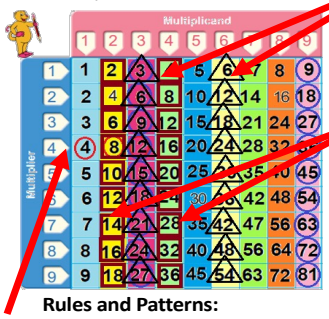
Activity

1 1 Let's make one complete multiplication table.



Hint of answers 4, 30 and 16
1) 4 is 2 × 2
2) 30 is 6 × 5
3) 16 is 2 × 8

Let's colour the multiplication table and look for patterns. (Textbook P215)



Rules and Patterns:

1) In row 4, the answer of 4 in the 1 times is table is added to answer 8 in the 2 times table gives the answer of 12 in the 3 times table column. (4+8=12) 4 8 12

2) If you double the answers of multiplication in column 3, it will give you the answers of Multiplication table of 6
3 doubled gives 6, (3+3=6), 6 doubled gives 12, (6+6=12) etc.. 3 6

3) If you double the answers of multiplication table 2 in column 2, it will give you the answers to Multiplication table of 4
14 doubled gives 28 (14+14=28), 18 doubled gives 36 (18+18=36) etc.. 14 28

Summary

- The structure of one complete multiplication table helps you find relationship between the multiplicand, multiplier and answers.

Unit 13

Unit: Multiplication (4)
Sub-unit: 1. Multiplication Table
Lesson 2 of 2

Textbook Page : p.159~160
Actual Lesson 117

Lesson Objective

- To identify the relationships between multiplicands, multipliers and products based on the multiplication table, and identify the rules, patterns and features of the table.

Prior Knowledge

- Using the 3- and 7-times tables from Problems 2, the answers progress with addition of 3 and 7 as multiplicand ranges from 1 to 9.

Preparation

- Enlarged picture from the textbook on p.159 and 160 and improvised coins for stacking in activity 4.

Assessment

- Find rules and patterns in the multiplication table. F
- Discover how the 3D multiplication table corresponds to the answers for each multiplication. F S

Teacher's Notes

Ensure to notice multiplication of 5, as the ones place goes from 0-5,
Also notice the discovery of diagonal numbers and the same answers appearing at different places and help pupils to understand the discoveries in the multiplication table.
The pupils also find out why and how this occurrences happen.

Lesson Flow

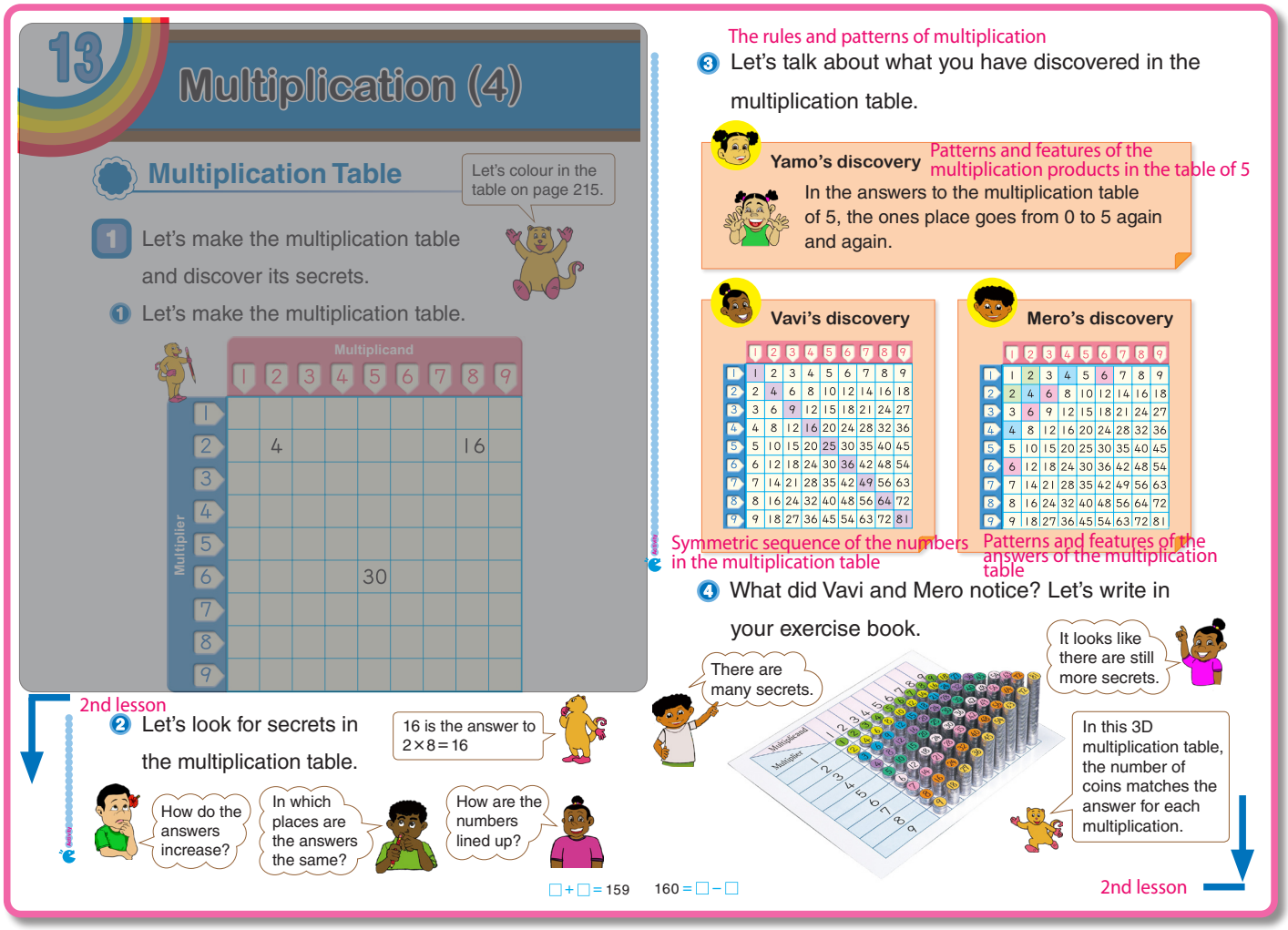
INTRODUCTION

1 Review.

T/P Review key ideas from previous lesson.

BODY

2 Introduce the Main Task.



Lesson Flow

T Introduce and explain the main task, 'Let's discover more patterns and rules and present our findings.'

3 Look for secrets in the multiplication table.

T/P ② Think about and discuss what kind of secrets they can find.

TN Allow pupils to share their discoveries and elaborate on the questions asked in the speech bubbles.

1) The answers increases by the multiplier when the multiplicand increases by 1.
2) In the multiplication table of 9.The numbers in the tens place increase by 1s, and the numbers in the ones place decrease by 1s. The sum of the ones place and the tens place is always 9.
3) The answer remains the same even when a multiplicand and a multiplier are switched.

4 Present findings from the multiplication table.

T ③ Let the pupils present what they have discovered from the multiplication table.

P Present their ideas, for example;
5, 10, 15, 20, 25, 30, 35, 40, 45, the ones place has the numbers 0 and 5 repeated.

T Confirm pupils' ideas and help other pupils see the patterns too.

TN Point out from the table that the numbers in the table have the symmetric sequence along the line drawn between 1 and 81.

T/P Review the symmetric sequence and see how the answers increase from 1 to 4, 4 to 9, 9 to 16… 64 to 81
Square numbers: 1×1=1, 2×2=4, 3×3=9, 8×8=64, 9×9=81

TN When a diagonal line is drawn from top left to bottom right, 2 numbers face each other, E.g. 3×4=12 and 4×3=12.
The order of multiplication changes however the answer remains the same.

5 ④ Write down what Vavi and Mero noticed from the 3D Multiplication table.

T Let the pupils write down what Vavi and Mero noticed in their exercise books.

P Look at the picture of coins placed on the multiplication according to the amount of each number, and examine how the height of the stacked coins changes.

T/P Let's explain how the stacks of coins build up to match the multiplication number;
e.g. 1×9=9 coins, 9×9=81 coins

P Stack improvised coins to understand how the answers or products increase.

T Confirm their stacks and help them to see how the stacks increase in numbers.

CONCLUSION

6 Summary.

T/P Summarise the lesson by confirming pupils' understanding of the main idea in the lesson.

Sample Blackboard Plan

Date: **Chapter 13:** Multiplication (4) **Sub-Chapter 1:** Multiplication Table **Lesson Number**: 2/2

Main Task: Let's discover more patterns and rules and present our findings.

Review

① Recall how to find rules and patterns while colouring the multiplication table.

Activity

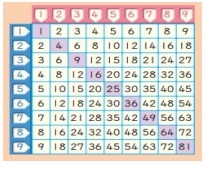
② Let's look for secrets in the multiplication table.



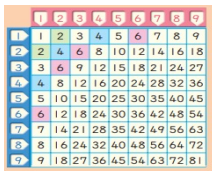
Rules and Patterns:

- When a multiplier increases by 1 the answer increases by the amount of the multiplicand. E.g. 2×1=2, 2x2=4
- The answers remain the same even when the multiplicand and the multiplier are switched. E.g. 2×8=16 or 8×2=16
- The answers in the tens place increases by 1s, and the numbers in the ones place decreases by 1s. The sum of the ones place and tens place is always 9. E.g. 9, 18, **Sum** 0+9=9, 1+8=9

③ Let's talk about what is discovered from the multiplication table.



Notice a symmetric sequence numbers increases from 1 to 4, 4 to 9, 9 to 16, 16 …. 64 to 81. They are square numbers of 1 × 1= 1, 2 × 2 = 4, etc…



When a diagonal line is drawn from top left to bottom right , 2 numbers face each other, E.g. 3 × 4 =12 and 4 × 3=12, 5 ×6=30 and 6 ×5=30. The order of multiplication changes but answer remains the same.

④ Let's write is seen from the 3D Multiplication table.



The number of coins matches the answers for each multiplication.

Summary

- There are mirror images of sequence of number patterns found in the Multiplication table.
- In the 3D Multiplication table, the number of coins matches the answers for each multiplication.

Unit 13

Unit: Multiplication (4)
Sub-unit: 2. Multiplication Games
Lesson 1 of 2

Textbook Page : p.161
Actual Lesson 118

Sub-unit Objectives

- To enjoy playing the multiplication game and deepen the understanding of what has been learnt.
- By referring to the multiplication table or applying the rules and patterns of multiplication, to devise ways of playing the game.

Lesson Objective

- To deepen the understanding of what has been learnt.

Prior Knowledge

- Commutative law of Multiplication.

Preparation

- Multiplication table for posting (with 36 squares), marbles for posting, blank multiplication table worksheet for pupils (with 36 squares), marbles, dices, bottle tops, counters.

Assessment

- Fill the multiplication table blanks given in the textbook. F
- Enjoy playing the multiplication game. F

Teacher's Notes

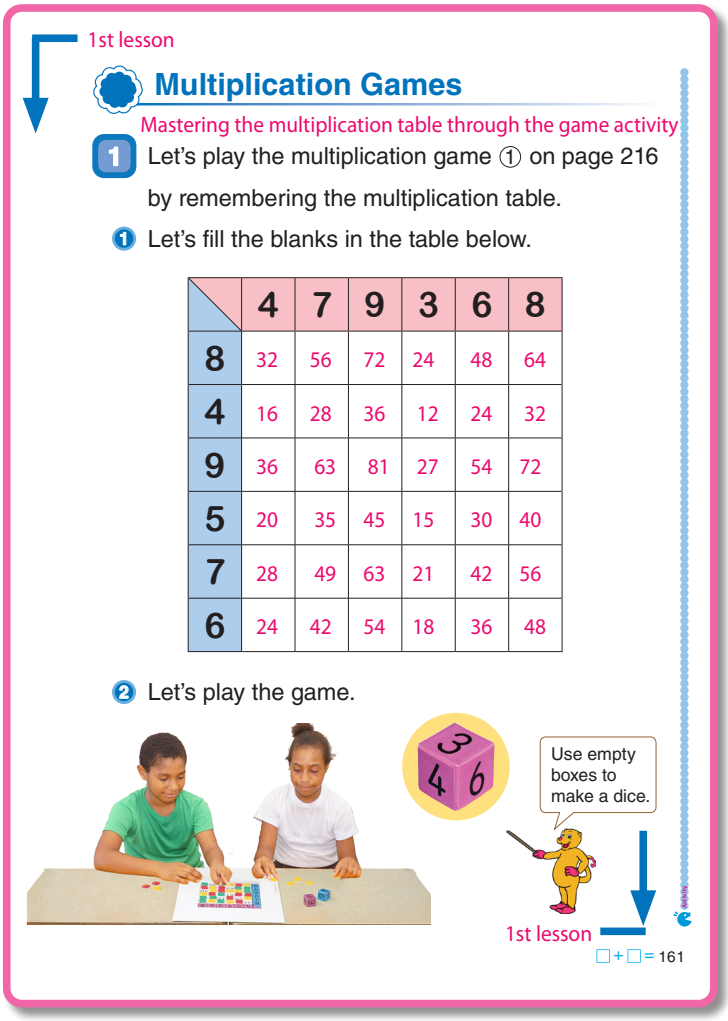
To play the Game Activities with Fun

1. Children love games. Learning through game activities is very effective. However, there are several points to be carefully considered to make the game activities enjoyable and effective.

a) The rules of the games should be clear. If the rules are not clear to pupils, some pupils may play the game in their own way. This can cause unnecessary troubles among pupils without having the lesson objective achieved as planned.

b) Winning or losing should not be encouraged, not too much emphasis

2. Most of the games have rules and are designed for pupils to enjoy competing with their friends to win. Observe pupils during the game, and advise them not to focus too much on winning or losing.
3. It is important that pupils have established supportive and good relationships with each other on a daily basis. Encourage pupils to enjoy playing the game after lessons.
4. Pupils can play the game during limited time in a lesson. Teacher should foster positive attitudes and motivation of pupils to play the game even after lessons. What Teacher can do to actualize such out-side-the-classroom learning is to set up an environment that enables pupils to easily start up the game: for example, preparing copies of paper with 16 or 36 squares and placing them in the classroom.



1st lesson

Multiplication Games

Mastering the multiplication table through the game activity

1 Let's play the multiplication game ① on page 216 by remembering the multiplication table.

① Let's fill the blanks in the table below.

	4	7	9	3	6	8
8	32	56	72	24	48	64
4	16	28	36	12	24	32
9	36	63	81	27	54	72
5	20	35	45	15	30	40
7	28	49	63	21	42	56
6	24	42	54	18	36	48

② Let's play the game.

Lesson Flow

INTRODUCTION

1 Review.

T/P Review key ideas from previous lesson.

BODY

2 Introduce the Main Task.

T Introduce and explain the main task 'Let's play the multiplication game in 1'.

3 1 1 Fill in the blanks to the Multiplication table.

T Get the pupils to open to p.161 of the text book and fill in the blanks to the multiplication table.

P Write the answers to the multiplication table by filling in the blank squares.
E.g. 4×8=32, 7×8=56

TN When pupils finish writing the answers on their own, check their answers with the class.

4 2 Play the multiplication game

T/P Let's: post a Multiplication Table on blank board as shown on p.161 and explain the rules of the game.

T/P Read and understand the game rules on p.216.

T Distribute dice to each pair of pupils.

P Go through the rule of the Multiplication Game and use the dice to play the game in pairs.

TN Teacher goes over the rules described on the blackboard plan with the steps 1 to 7 referring to the multiplication table posted on the blackboard.

CONLUSION

5 Summary.

T/P Summarise the lesson by confirming pupils' understanding of the main ideas in the lesson.

Sample Blackboard Plan

Date: **Chapter 13:** Multiplication (4) **Sub-Chapter 2:** Multiplication Games **Lesson Number**: 1/2

Main Task: Let's play the multiplication game in 1 .

Review

① Discuss the rules and patterns identified in the multiplication table.

Activity

1 1 Let's fill in the blanks in the table below.

	4	7	9	3	6	8
8						
4						
9						
5						
7						
6						

2 Let's play the game using 2 dices.



(Textbook P216)

How to play the game.

1. Use empty boxes to make 2 dices.
2. Write down the numbers on the dice shown on the top row of the multiplication table.
3. Write down the numbers on the dice shown on the left column of the multiplication table.
4. Then throw the two dice and multiply the two numbers that appear and say the answers.
5. Write the answers on the table by filling in the blank squares.
6. Check the answer. If the answer is correct, the pupils can be rewarded with a counter.
7. The pupil that has the most number of counters is the winner.

	4	7	9	3	6	8
8	32	56	72	24	48	64
4	16	28	36	12	24	32
9	36	63	81	27	54	72
5	20	35	45	15	30	40
7	28	49	63	21	42	56
6	24	42	54	18	36	48

Summary

- When playing the multiplication game, it deepens their understanding of the multiplication table.

Unit 13

Unit: Multiplication (4)
Sub-unit: 2. Multiplication Games
Lesson 2 of 2

Textbook Page : p.162
Actual Lesson 119

Lesson Objective

- To understand the rule of the “Multiplication Game” at the back of the textbook, and enjoy playing the game.

Prior Knowledge

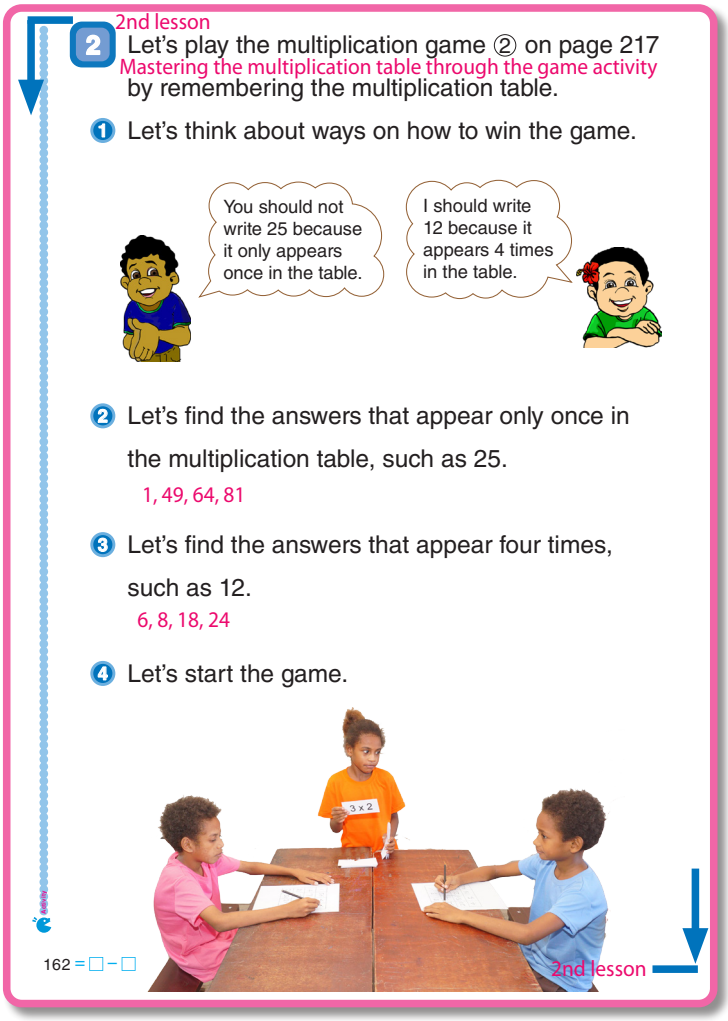
- Multiplication Game.
- Play a “capture the points” game

Preparation

- Play a “capture the points” game, multiplication table for posting (with 16 squares), blank multiplication table worksheet for pupils (with 25 squares and 25 squares), multiplication table card, multiplication table

Assessment

- Explain the rules of Mathematics. F
- Find strategies to win the multiplication game. F
- Enjoy playing the multiplication game. F



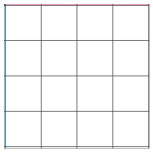
Teacher’s Notes

Mastering the multiplication table through the game activity

Show the chart with 16 squares and read the rules of the multiplication game (2). Pupils listen attentively and understand the rule of the ‘Multiplication Game’

Teacher demonstrates in how to play the game with a pupil with 40 cards (each pair of pupils should have a set of 40 cards to play the game).

1. Chart with 16 squares



Hints on how to play the Multiplication Game 2:

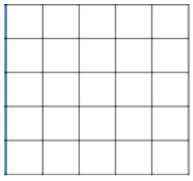
1. Fill in any number from the multiplication table into the table of 16 squares.
2. A person in a group chooses a card from a complete set of the multiplication cards and reads it aloud for the group members, e.g. $3 \times 6 = 12$.
3. Each person calculates the multiplication and circles the answer 12 if it is in the table.
4. A person gets 1 point when there is a circle symbol ‘O’ on every number discovered in a row, column or diagonal they find.
5. A person who gets the most points wins the game.

For example:

81	63	45	72	
45	35	25	40	
63	49	35	56	
72	56	40	64	

18	45	72	27	
2	5	8	3	
8	10	32	12	
14	35	56	21	

2. Chart with 25 squares



Lesson Flow

INTRODUCTION

1 Review

T/P Review key ideas from previous lesson.

BODY

2 Introduce the Main Task.

T Introduce and explain the main task"Let's play multiplication game in ②".

TN Teacher goes over the rules described in steps 1 to 5 by showing the chart with 16 squares posted on the blackboard.

3 ② ① Think about ways in how to win the game.

T Let the pupils understand the rules of the 'Multiplication Game' on p.217 of the textbook.

P Go over the rules described on p.217.

T Let the pupils think of a strategy in winning the game.

TN If pupils have not clearly understood the rule of the game, they cannot even think of a strategy to win the game.
If pupils are not clear about the rule, Teacher can let them first play the game once or twice to get the idea about how the game flows and let them think of a strategy.

P Play the game once or twice to get the idea about how the game flows and let them think of a strategy.

4 ② Find answers that appear only once.

T Let the pupils look for the answers such as 25 that appear only once in the multiplication table.

P Write the number in the 16 square box and in pairs play the game.

5 ③ Let's find answers that appear four times.

T Get the pupils look for the answers such as 12 that appear four times in the multiplication table.

P Write the numbers in their table and play the game.

TN Pupils need to realise that they should write the answers that appear many times in the multiplication table to win the game.

6 ④ Let's start the game.

T Get the pupils to play the game using 25 squares.

P Write their numbers in their table and play the game.

TN Allow the pupils work in groups. Each group should pick 40 cards.
The person who gets the most points is a winner.

T Let them play the game in their own creative ways by applying a different rule or by adding more squares to the sheet. Pupils will enjoy making new rules.

CONCLUSION

7 Summary.

T/P Summarise the lesson by confirming pupils' understanding of the main ideas in the lesson.

Sample Blackboard Plan

Date: **Chapter 13:** Multiplication (4) **Sub-Chapter 2:** Multiplication Games **Lesson Number**: 2/2

Main Task: Let's play the multiplication game in ② (Page 217) .

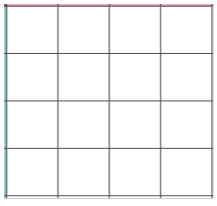
Review

① Discuss the rules and patterns identified in the multiplication table.

Activity

② Let's play the multiplication game ② by filling in the 16 squares with answers.

① Let's think about ways on how to win the game.



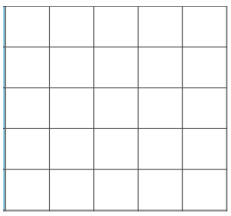
② Let's find the answers that appear only once such as 25.

81	63	45	72
45	35	25	40
63	49	35	56
72	56	40	64

③ Let's find the answers that appear four times such as 12.

18	45	72	27
2	5	8	3
8	10	32	12
14	35	56	21

④ Let's start the game by filling in the 25 squares with answers of your choice.





Summary

- A strategy to win the game would be to write answers that appear many times in the multiplication table .

Unit 13

Unit: Multiplication (4)
Sub-unit: 3. Multiplication more than 9×9
Lesson 1 of 3

Textbook Page : p.163~164
Actual Lesson 120

Sub-unit Objectives

- To explore simple properties which hold for multiplication, and to make use of them for making the multiplication table up to 9 times 9 and for checking the results of calculations.
- To understand the multiplication table up to 9 times 9 and to multiply one-digit numbers accurately.
- To explore ways of multiplication of a two-digit number and a one digit number in simple cases.

Lesson Objective

- To think of how to calculate multiplication more than 3×9 by using the prior knowledge about the commutative law of multiplication and the rules of multiplication or by manipulating concrete objects

Prior Knowledge

- Multiplication Games, Patterns and repeated additions and commutative law of multiplication rules and patterns.
- Multiplication table of 3, mathematics blocks

Preparation

- Mero's Chart, Ambai's Chart, Naiko's idea chart.

Assessment

- Explain how to write expressions for multiplication more than 3×9. F
- Calculate 3×12 using repeated addition. F
- Calculate 3×12 by grouping, multiplying and adding to find the answer. S

Lesson Flow

INTRODUCTION

1 Review.

T/P Review key ideas from previous lesson.

BODY

2 Introduce the Main Task.

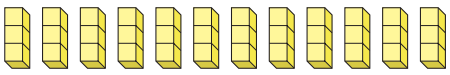
T Introduce and explain the main task' 'Let's find some rules and patterns in the multiplication table of 3'.

1st lesson

Multiplication more than 9×9

Multiplication more than 9 × 9

1 Blocks are lined up as shown below.



Let's find the total number of these blocks.

1 Ketsin made the multiplication expression below.

Let's fill the ☐ with a number.

3× 12

2 Let's think about how to find the number by using what you have learned before.

Multiplication based on the increasing pattern

Mero's idea

In the multiplication table, the answer in the multiplication table of 3 will increase by 3 from 3×1=3.
So the answers keep increasing even if it gets past 3×9.

3× 9=27
3×10=30 (+3)
3×11= 33 (+3)
3×12= 36 (+3)

☐+☐=163

164=☐−☐

Explaining how to calculate multiplication more than 9 × 9

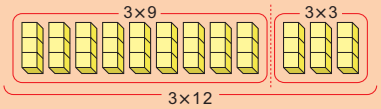
2 Let's think about how to calculate.

1 Ambai and Naiko made the expression 3×12.

Let's explain their ideas.

Decomposing the multiplier

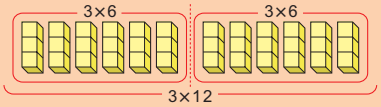
Ambai's idea



When the answers to 3×9 and 3×3 are added, it will be the answer of 3×12.
So 27+9=36

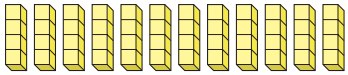
Decomposing the multiplier

Naiko's idea



When the blocks are divided into 6 columns, the answer to 3×12 will be two times the answer to 3×6.
So 3×6=18, 18+18=36

2 Let's think about how to calculate 4×12.



Eg, 4×5=20
4×7=28
20+28=48

4×6=24
24+24=48

1st lesson

Lesson Flow

3 ① Find the total number of this blocks.

T Let the pupils read the problem and understand that it involves multiplication of more than 3×9.

P Line up blocks in columns of 3s and find that the total number of blocks is 36.

T Confirm and explain that the number of blocks can be solved in the same way using multiplication of 3.

4 ① Fill the □ with a number.

T Let pupils make a math expression by filling in the □ with a number.

P Write 12 in the □ to represent the number of times blocks of 3 pieces is placed and that the math expression would be 3×12.

TN Confirm and review the meaning of multiplication and the relationships between a multiplier and a multiplicand.

P The answer for multiplier and multiplicand is the same even when they are switched and the answer increases by number of the multiplier when the multiplicand increases.

5 ② Think about how to find the number.

T/P Think how to calculate the expression 3×12 and solve it using prior knowledge.

P Discuss and apply repeated addition first.

TN Teacher should have pupils understand that:

1) Answers increase by 3s in the multiplication table of 3.
2) Therefore, even when the multiplication goes beyond 3×9; the answers keep increasing by 3s.

TN For Mero' idea, it is better to have pupils first write +3, then the answers 33 and 36 in the boxes.

6 ② Think about how to calculate.

T/P ① Explain how Ambai and Naiko made their expression to calculate 3×12.

P Explain the two ideas.

TN Check, confirm and explain the ideas.

Ambai's Idea	Naiko's Idea
3 × 9 = 27	3 × 6 = 18
3 × 3 = 9	18 + 18 = 36
27 + 9 = 36	Answer 36 blocks
Answer 36 blocks	

7 ② Let's think about how to calculate 4×12.

TN Pupils may come up with other ideas apart from the ones that the textbook introduces in ① ② or in ② ①. Teacher should encourage pupils to explore various ideas.

P Share and explain their ideas with reference to the ideas in the text book and come up with their own ideas for the blocks of 12×4.

CONCLUSION

8 Summary.

T/P Summarise the lesson by confirming pupils' understanding of the main ideas in the lesson.

Due to space limitations, the Teacher's Notes is placed on page 274.

Sample Blackboard Plan

Date: **Chapter 13:** Multiplication (4) **Sub-Chapter 3:** Multiplication more than 9 × 9 **Lesson Number**: 1/3

Main Task: Let's find some rules and patterns in the multiplication table of 3.

Review

① Revisit the multiplication table of 3 and 9.

Activity

1 ① Let's find the total number of the blocks.



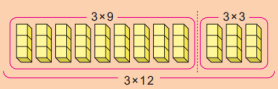
Math Expression: 3 × 12 = 36

② Let's think about how to find the number of blocks.

3× 9=27 +3
3×10=30
3×11= □ □
3×12= □

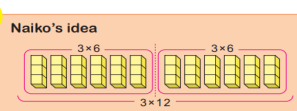
② ① Let's think about how to calculate by explaining how Ambai and Naiko made their expressions.

Ambai's idea



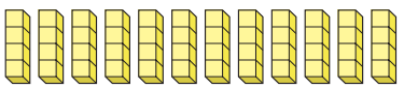
When the answers to 3×9 and 3×3 are added, it will be the answer of 3×12.
So 27+9=36

Naiko's idea



When the blocks are divided into 6 columns, the answer to 3×12 will be two times the answer to 3×6.
So 3×6=18, 18+18=36

② Let's think about how to calculate 4 × 12.



1) 4 × 9 = 36 and 4 × 3 =12, so 36 + 12 = 48
2) 4 × 6 = 24 and 4 × 6 = 24, so 24 + 24 = 48

Summary

- We can calculate multiplication that is more than 3 × 9 by repeated addition, regrouping, multiplying and adding.

Unit 13

Unit: Multiplication (4)
Sub-unit: 3. Multiplication more than 9×9
Lesson 2 of 3

Textbook Page : p.165~166
Actual Lesson 121

Lesson Objective

- To think of how to calculate multiplication more than 9×9 by using the prior knowledge about the commutative law of multiplication and the rules of multiplication or by manipulating concrete objects.

Prior Knowledge

- Multiplication Games, Patterns and repeated additions and commutative law of multiplication rules and patterns.

Preparation

- Ambai Chart , Naiko Chart , Yamo idea chart, Vavi's idea chart, multiplication blocks for 13 times table and 4 times table.

Assessment

- Explain how to write expressions for multiplication more than 9×9. F
- Calculate 3×12 in repeated addition. F
- Calculate 3×12 in grouping, multiplying and adding to find the answer. S

Lesson Flow

INTRODUCTION

1 Review.

T/P Review key ideas from previous lesson.

BODY

2 Introduce the Main Task.

T Introduce and explain the main task "Let's think about how to calculate 13×3".

3 3 Read and understand the problem

T/P Read the problem and understand that it involves multiplication more than 9×9.

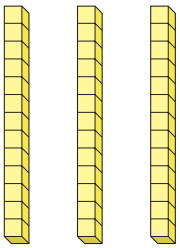
P Line up the blocks in columns of 13s and find that the total number of blocks is 39.

2nd lesson

3 Blocks are lined up as shown on the right.

Multiplication with a multiplicand more than 9

Let's find the total number of the blocks.



1 Nobin made the multiplication expression below.

Let's fill the ☐ with a number.

13 ×3

2 Let's think about how to find the number by using what you learned before.

Multiplication by applying the commutative law of multiplication and the increasing pattern

Yamo's idea

In multiplication, if we change the order of the multiplicand and the multiplier, the answer is the same.
So we can find the answer to 3×13.
Start with the multiplication table of 3,

3×12=36

3×13=39

So 13×3=39

☐+☐=165

166=☐−☐

Explaining how to calculate multiplication more than 9×9

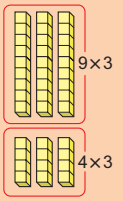
4 Let's think about how to calculate.

1 Vavi and Gawi thought about the expression 13×3. Explain their ideas.

Decomposing the multiplier

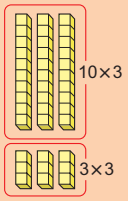
Vavi's idea

She is using what she noticed in the multiplication table.
For example, when the answers to the multiplication table of 3 and of 4 are added, the answer will be an answer to the multiplication table of 7.
So when the multiplication table of 9 and of 4 are added, the answer will be the answer to 13×3.

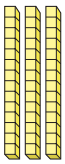


Gawi's idea

Split 13 to 10 and 3.
10×3 is 3 times 10, so it is 30.
3×3=9
So 30+9=39



2 Let's think about how to calculate 14×3.



Eg, 9×3=27
5×3=15
27+15=42

10×3=30
4×3=12
30+12=42

2nd lesson

Lesson Flow

4 ① Fill the □ with a number.

T Get the pupils to make a math expression by filling in the □ with a number.

P Write 13 in the □ to represent the number of times blocks of 13 pieces is placed and that the math expression would be 13×3

TN Teacher confirms with pupils that the expression for the given problem is 13×3 and review previous learning.

P The answer for multiplicand and multiplier is the same even when they are switched and the answer increases by the number of the multiplier.

5 ② **Think about how to find the number using prior knowledge.**

T/P Think how to calculate the expression 3×13 and solve it.

P Identify the number of blocks by using their prior knowledge. Pupils can apply repeated addition first.

6 ④ **Think about how to calculate.**

T/P ① Explain how Vavi and Gawi thought about the expression to calculate 13×3.

T Post the picture of the blocks and let the pupils explain the two ideas.

P Think about and explain the 2 ideas.

T Based on Vavi and Gawi's ideas confirm and correct pupils explanations using examples.

Ambai's Idea	Naiko's Idea
3 × 9 = 27 3 × 3 = 9 27 + 9 = 36 Answer 36 blocks	3 × 6 = 18 18 + 18 = 36 Answer 36 blocks

7 ② **Think about how to calculate 14×3.**

T Let the pupils think about how to calculate 14×3.

TN Pupils may come up with other ideas than the ones introduced in the textbook.
Teacher should encourage pupils to explore various ideas.

TN However, the learning should not end with just thinking of various ideas.
Teacher should have pupils learn how to use their notebooks and how to present their ideas.

P Share and explain their ideas with reference to the ideas in the text book, they can also come with their own ideas for the blocks of 14×3

CONCLUSION

8 **Summary.**

T/P Summarise the lesson by confirming pupils' understanding of the main ideas in the lesson.

Due to space limitations, the Teacher's Notes is placed on page 280.

Sample Blackboard Plan

Date: **Chapter 13:** Multiplication (4) **Sub-Chapter 3:** Multiplication more than 9 × 9 **Lesson Number**: 2/3

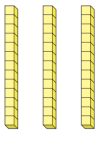
Main Task: Let's think about how to calculate 13 × 3.

Review

① Revisit the multiplication table of more than 3 × 9.

Activity

3 ① Let's find the total number of the blocks.



Math Expression: 13 × 3 = 39

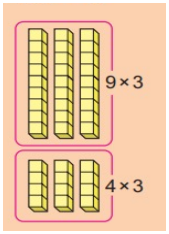
② Let's think about how to find the number of blocks.

3×12=36

3×□=□

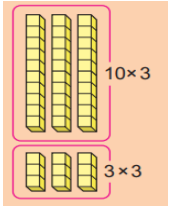
So □×3=□

4 ① Let's think about how to calculate by explaining how Vavi and Gawi made their expressions.



Vavi's idea

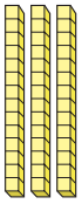
When the answers to the multiplication table of 3 and 4 are added, the answer will be an answer to the multiplication table of 7 so when the multiplication of 9 and of 4 are added, the answer will be the answer to 13 × 3.



Gawi's idea

Split 13 to 10 and 3.
10 × 3 is 3 times 10, so it is 30.
3× 3= 9
So 30 + 9 = 39

② Let's think about how to calculate 14 × 3.



9 × 3=27 and 5 × 3 = 15
So 27 + 15 = 42

Split 14 to 10 and 4
10 × 3 = 30
4 × 3= 12
So 30 +12 =42

Summary

- We can calculate multiplication where the multiplicand is more than 9 by repeated addition, regrouping, multiplying and adding.

Unit 13

Unit: Multiplication (4)
Sub-unit: 3. Multiplication more than 9×9
Lesson 3 of 3

Textbook Page : p.167
Actual Lesson 122

Lesson Objective

- To read the presented problem and think about a possible sitting arrangement by utilising the prior knowledge about the multiplication table.

Prior Knowledge

- Multiplication with a multiplicand more than 9
- Multiplication by applying the commutative law of multiplication and the increasing pattern.

Preparation

- Mathematics blocks for posting, aeroplane seat chart for posting, digital textbook software (if available).

Assessment

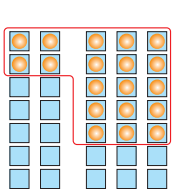
- Explain how to write expressions for multiplication more than 9×9. F S

3rd lesson
Identification of sitting patterns without leaving anyone sitting alone

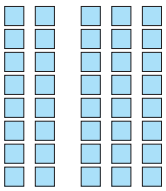
Taking Seats

5 There are 19 people in the airplane. They use seats for 2 or 3 people in a row.
We want to make sure no one sits alone.









Describing seat arrangement in pictures

Seats for 3 people are [5] and seats for 2 people are [2].
3×[5] and 2×[2].



If we combine seats for 2 people and seats for 3 people like this, we can enjoy traveling without making any person sit alone.

Really? With any number of people?

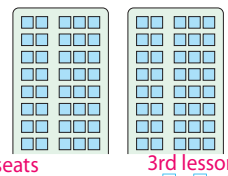


Representing the identified seat arrangement in multiplication expressions

6 Let's see when the number of people is different.
Applying multiplication

3×6=18
2×1=2
18+2=20

Eg, 20 people



6 rows of three-passenger seats
1 row of two-passenger seats

3rd lesson
□+□=167

Teacher's Notes

Teaching Tips: Using the Multiplication Table in Daily Life Situations

1) Teacher can have pupils look for various situations where they can use the multiplication table in their school environment or in their daily environment.

School environment
- The number of lockers
- The number of shoes
- The number of desks

2) Teacher can prepare the pictures desks in other classrooms.)
- The number of windows in a school building
- The number of floor tiles

3) Daily environment
- The number of eggs in a carton
- The number of stamps on a stamp sheet

p.270 Teacher's Notes

Teaching Tips: Rules and Patterns of Multiplication

1) Multiplication of more than 3×9 can be handled by applying the rules and patterns of the basic multiplication they learnt in the previous lessons.

1. Repeated addition-Adding the amount of a multiplicand for the number of a multiplier
   3+3+3+...
2. Increase pattern-When a multiplier increases by 1, the answer increases for the amount of a multiplicand.
   3×9=27, 27+3=30, 30+3=33, 33+3=36
3. Exchange pattern-Switching a multiplier and a multiplicand
   3×12=12×3 and 12×3=12+12+12=36
4. Decomposition pattern-Decomposing a multiplier.

2) Other than these patterns, there is a combination pattern, that is the answers in the table of 4 multiplied by 2 become the answers in the multiplication table of 4, and those multiplied by 3 become the answers in the multiplication table of 6.

Lesson Flow

INTRODUCTION

1 Review.

T/P Review key ideas from previous lesson.

BODY

2 Introduce the Main Task.

T Introduce and explain the main task "Let's think about how 19 people can sit without leaving anyone sitting alone."

3 5 Read and understand the task.

T/P Read and understand the description and conditions given of the task.

TN Teacher should go over the conditions given in the problem;

1) there are 19 people;
2) there are two-passenger seats and three-passenger seats;
3) no one should be sitting alone.

TN Teacher should also check with pupils' other basic points;

a) 3 people should sit on a three-passenger seat;
b) 2 people should sit on a two-passenger seat.

4 Think about how to organise the sits for the 19 passengers.

T Get the pupils to think of how to do the sitting arrangement.

P Think about how 19 people can sit.

TN Check how pupils are solving the problem and whether they are following the conditions given in the problem.
When pupils do not have a clear understanding of the given conditions, Teacher should provide individual support and guidance.

T Instruct pupils to make sure they first think of the plane's seat worksheets and write related to the math expressions.

TN When pupils identify some patterns, teacher should encourage them to explore other patterns if any.

5 6 Think about the cases where the number of people is different.

TN Teacher can use a group activity here.
Each group decides on the number of people and starts thinking.

T/P Write the math expressions and practice using multiplication.

CONCLUSION

6 Summary.

T/P Summarise the lesson by confirming pupils' understanding of the main ideas in the lesson.

TN Help pupils to conclude that we can use multiplication to solve everyday problems.

Sample Blackboard Plan

Date: **Chapter 13:** Multiplication (4) **Sub-Chapter 3:** Multiplication more than 9 × 9 **Lesson Number**: 3/3

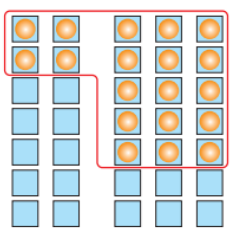
Main Task: Let's think about how 19 people can sit without leaving anyone sitting alone.

Review

① Review how to write expressions for multiplication more than 9 × 9.

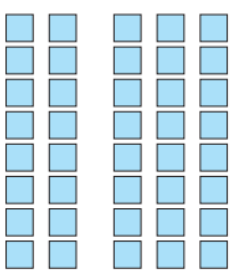
Activity

5 ① There are 19 people on an airplane. They use seats for 2 or 3 people in a row.
We want to make sure that no one sits alone.



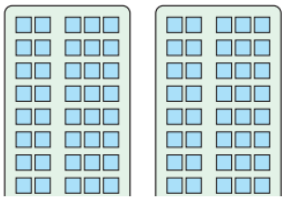
We can sit by 3 ×5 and 2 × 2

Isn't there another way of taking seats



Seats for 3 people are 3 and seats for 2 people are 5.
3 × 3 and 2 × 5.

6 Let's see when the number of people is different.



3 × 9 = 27 and 2 × 11 = 22
27 + 22
For 49 passengers

Summary

- We can use multiplication to solve everyday problems.

Unit 13

Unit: Multiplication (4)
Problems 1
Lesson 1 of 2

Textbook Page : p.168
Actual Lesson 123

Sub-unit Objectives

- To review what have been learnt.
- To deepen one's understanding of multiplication concept through various multiplication tables.

Lesson Objective

- To review and deepen their understanding of what has been learnt about the multiplication concept through various multiplication tables.

Prior Knowledge

- To review their understanding of what has been learnt about the multiplication concept through various multiplication tables.

Preparation

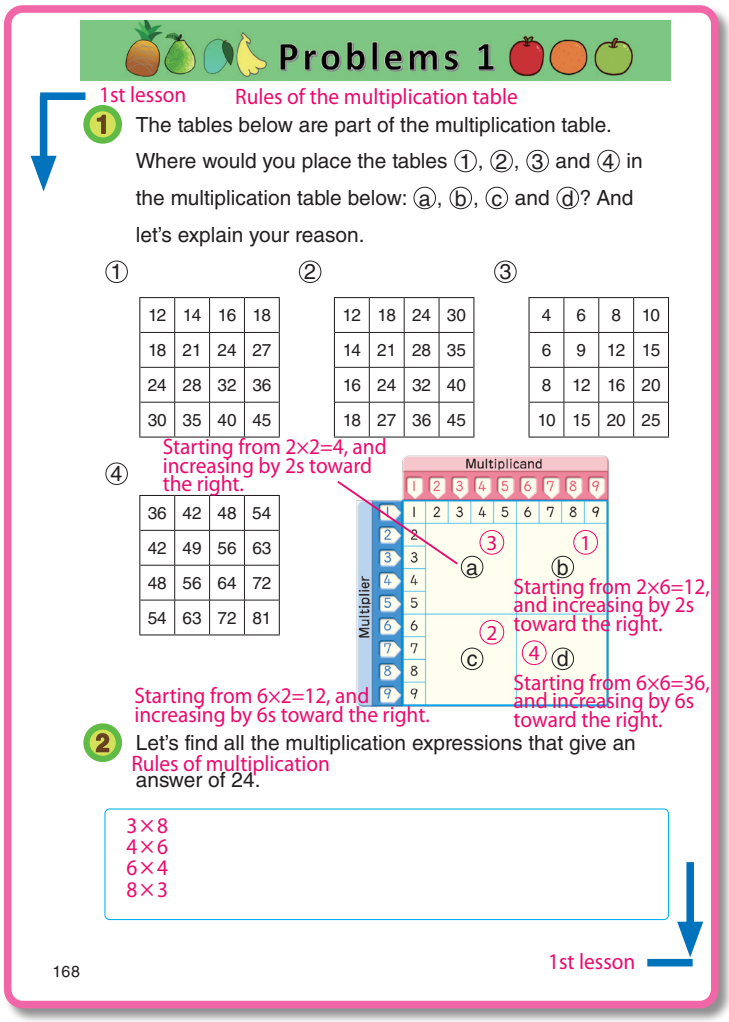
- Multiplication tables.

Assessment

- To review what have been learnt about the multiplication concept through various multiplication tables. S

Teacher's Notes

For Problems 1 and 2,
Problems 1 can be given to pupils as homework and checked quickly during the lesson while Problem 2 can be done during the lesson for pupils' problem-solving practices. 1 and 2 should be done within one period.
This lesson focuses on:
(1) Making the multiplication table and discovering rules and patterns in the multiplication table.
(2) The features of the multiplication answers in the table of 5.
(3) Symmetric sequence of the numbers in the multiplication table.
(4) Patterns and features of the answers of the multiplication table.
(5) Commutative law of multiplication. The answers are the same.
Reinforcing the commutative law of multiplication.
(6) Mastering the multiplication table through the game activity.
(7) Multiplication based on the increasing pattern.
(8) Decomposing the multiplier or the multiplier if it is more than 9×9
(9) Identification of sitting patterns without leaving anyone sitting alone and applying multiplication in daily life experiences.



Lesson Flow

PROBLEMS 1

1 Identify where in the multiplication table they place tables ①, ②, ③ and ④.

T/P Let the pupils use their prior knowledge they have acquired about the features of the multiplication table as well as the rules and relationships of multiplicands, multipliers and products, pupils identify where in the multiplication table they can place the tables ①, ②, ③ and ④.

P Find where in the multiplication table is where they can place tables ①, ②, ③ and ④.

TN If pupils place the tables ① and ② oppositely as they both have 12 at their left top corners, Teacher can advise pupils to check whether it is 2×6 (thus, the row of 2) or 6×2 (thus, the row of 6).

P Apply rules and patterns to find the answers.

TN If pupils have difficulties in carrying out this activity, Teacher can advise them to find any numbers they remember from the multiplication table. For example, at the left top corner of ⓐ is 2×2=4, the table ③ should be placed there; as the right bottom corner of ⓓ is 9×9=81, the table ④ should be placed there; as the right top corner of ⓑ is 5×6=30, the table ① should be placed there; and as the bottom left corner of ⓒ is 9×2=18, the table ② should be placed there.

2 Find all multiplication expressions that give the answer 24.

T/P Identify the multiplication expressions whose answer or product is 24.

TN If pupils have difficulties in carrying out this activity, Teacher can advise them to look at the multiplication table or use 24 mathematics blocks.

P Use the multiplication to find your answers

TN For pupils who have only written 3×8 and 4×6, Teacher advises them to describe the expressions in the dot charts (array charts) and have them look at the numbers differently. Teacher can then remind them of the commutative law of multiplication; 3×8=8×3, 4×6=6×4.

TN For pupils who have only written 4×6 and 6×4, Teacher advises them to look at the multiplication table and think if there are other multiplication expressions.

TN For pupils who have not correctly memorised the multiplication table, Teacher should have them practice many times with the use of the blocks, the dot charts, a set of the multiplication cards and the multiplication table until they memorise it accurately.

Sample Blackboard Plan

Date: **Chapter 13:** Multiplication (4) **Sub-Chapter 4:** Problems **Lesson Number**: 1/2

Main Task: Let's review to confirm what we have learnt in Multiplication (4).

Problem 1

1 Where would you place these tables ①, ②, ③ and ④ on the multiplication table?

①

12	14	16	18
18	21	24	27
24	28	32	36
30	35	40	45

②

12	18	24	30
14	21	28	35
16	24	32	40
18	27	36	45

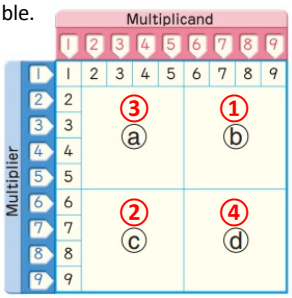
③

4	6	8	10
6	9	12	15
8	12	16	20
10	15	20	25

④

36	42	48	54
42	49	56	63
48	56	64	72
54	63	72	81

Explain your reasons as to why you placed table ①, ②, ③ or ④ in section ⓐ, ⓑ, ⓒ and ⓓ of the multiplication table.



1. Bottom left corner of ⓑ is 5 × 6 = 30, table ① should be placed there

2. Top left corner of ⓐ, is 2 × 2 = 4 and table ③ should be placed there.

3. Bottom right corner 9 × 9 = 81, table ④ should be placed in ⓓ.

4. Bottom left corner 9 × 2 =18, table 2 should be placed in ⓒ.

2 Find all multiplication expressions that give 24.

3 × 8 = 24
4 × 6 = 24
6 × 4 = 24
8 × 3 = 24

Unit 13

Unit: Multiplication (4)
Problems 2
Lesson 2 of 2

Textbook Page : p.169
Actual Lesson 124

Sub-unit Objectives

- To review what have been learnt.
- To deepen one's understanding of multiplication concept through various multiplication tables.

Lesson Objectives

- To review and deepen their understanding of what has been learnt about the multiplication concept through various multiplication tables.

Prior Knowledge

- To review their understanding of what has been learnt about the multiplication concept through various multiplication tables.

Preparation

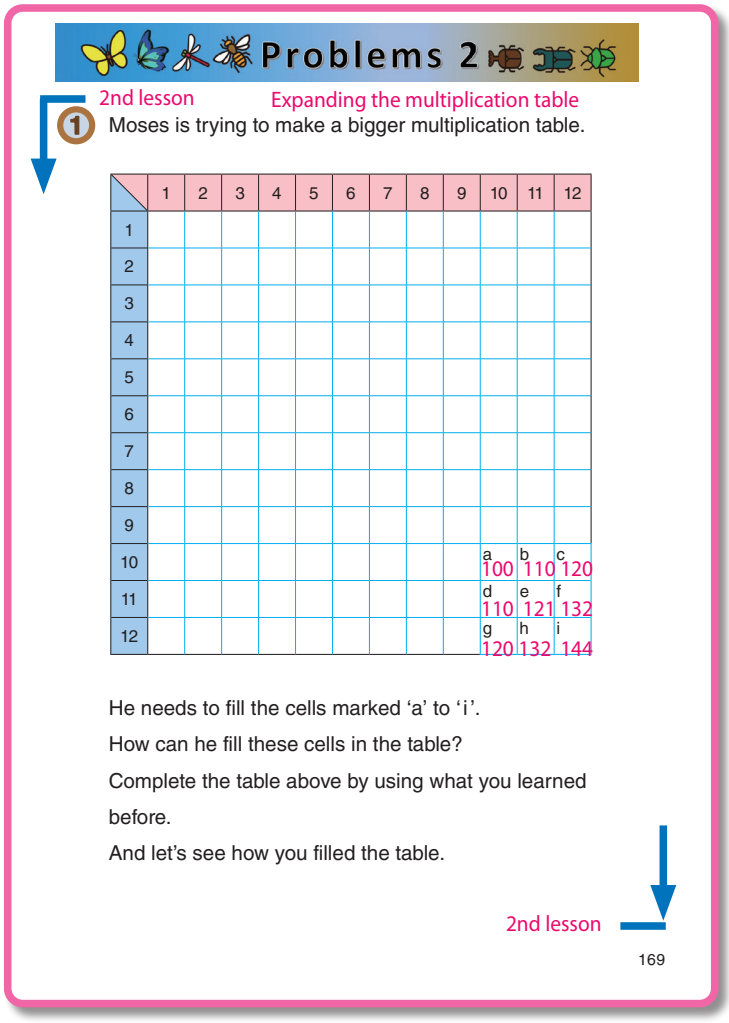
- Multiplication tables

Assessment

- To review what has been learnt about the multiplication concept through various multiplication tables. S

Teacher's Notes

This lesson focuses on:
(1) Making the multiplication table and discovering rules and patterns in the multiplication table.
(2) The features of the multiplication answers in the table of 5
(3) Symmetric sequence of the numbers in the multiplication table
(4) Patterns and features of the answers of the multiplication table.
(5) Commutative law of multiplication. The answers are the same.
Reinforcing the commutative law of multiplication.
(6) Mastering the multiplication table through the game activity.
(7) Multiplication based on the increasing pattern.
(8) Decomposing the multiplier or the multiplier if it is more than 9×9.
(9) Identification of sitting patterns without leaving anyone sitting alone and applying multiplication in daily life experiences.



Problems 2

2nd lesson Expanding the multiplication table

1 Moses is trying to make a bigger multiplication table.

	1	2	3	4	5	6	7	8	9	10	11	12
1												
2												
3												
4												
5												
6												
7												
8												
9												
10										a 100	b 110	c 120
11										d 110	e 121	f 132
12										g 120	h 132	i 144

He needs to fill the cells marked 'a' to 'i'.
How can he fill these cells in the table?
Complete the table above by using what you learned before.
And let's see how you filled the table.

2nd lesson

169

Lesson Flow

PROBLEMS 2

① Study the structure of the multiplication table and make one entire complete multiplication table.

T/P Let the pupils review the rules of multiplication.

TN Teacher tells pupils to complete the multiplication table up to 9×9.
Teacher then confirms with pupils some important rules of multiplication.

P Complete the multiplication table up to 9×9.

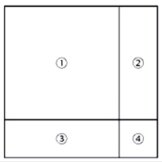
T/P Review what has been learnt together.

1. Review of the terms, multiplicands and multipliers: where in the table are, they written?
2. How do the numbers increase in each row?
"When a multiplier increases by 1, the answer increases for the amount of a multiplicand."
3. Commutative Law of Multiplication (Pupils do not have to know the name of the Law.)
"The answer remains the same even when a multiplier and a multiplicand are switched."
4. Expand the multiplication table to calculate tables that are more than 9×9.

T Let the pupils expand the multiplication table to more than 9×9.

TN Tell pupils to remember the rules of multiplication they have learnt and make a bigger multiplication table going beyond 9×9.

1. The table can be completed in the following order in accordance with the rules of multiplication.



2. ① The area of multiplication up to 9×9
3. ② When a multiplier increases by 1, the answer increases for the amount of a multiplicand.
4. ③ The answer remains the same even when a multiplier and a multiplicand are switched.

Sample Blackboard Plan

Date: **Chapter 13:** Multiplication (4) **Sub-Chapter 4:** Problems **Lesson Number**: 2/2

Main Task: Let's review to confirm what we have learnt in Multiplication (4).

Problem 2

① ❶ Moses is trying to make a bigger multiplication table.

	1	2	3	4	5	6	7	8	9	10	11	12
1	1	2	3	4	5	6	7	8	9	10	11	12
2	2	4	6	8	10	12	14	16	18	20	22	24
3	3	6	9	12	15	18	21	24	27	30	33	36
4	4	8	12	16	20	24	28	32	36	40	44	48
5	5	10	15	20	25	30	35	40	45	50	55	60
6	6	12	18	24	30	36	42	48	54	60	66	72
7	7	14	21	28	35	42	49	56	63	70	77	84
8	8	16	24	32	40	48	56	64	72	80	88	96
9	9	18	27	36	45	54	63	72	81	90	99	108
10	10	20	30	40	50	60	70	80	90	a	b	c
11	11	22	33	44	55	66	77	88	99	d	e	f
12	12	24	36	48	60	72	84	96	108	g	h	i

How do the numbers increase in each row?

1. 'When a multiplier increases by 1, the answer increases by the amount of the multiplicand.'

2. 'The answer remains the same even when the multiplier and the multiplicand are switched.

3. 'Rules to make a bigger multiplication table when going more than 9 × 9.

3× 9=27
3×10=30 +3
3×11=
3×12=

❷ How can Moses fill the cells marked (a) to (i) in the table?

1. For the cell (a)
10 × 10
5 × 10=50 and 5 × 10 = 50
So 50 + 50 = 100

2. For cells (b) and (d).
10 × 11 or 11 × 10
10 × 4 = 40 and 10 × 7 =70,
so 40 + 70 = 110

3. For cell (f) and (h).
12 × 11 or 11 × 12
6 × 11 = 66 and 6 × 11 =33,
so 66 + 66 = 132

4. For the cell (e)
11 × 11
6 × 11 = 66 and 5 × 11 =55,
so 66 + 55 = 121

5. For the cell (i)
12 × 12
6 × 12 = 72 and 6 × 12 =72,
so 72 + 72 = 144

6. For the cell (c) and (g)
12 × 10 or 10 × 12
6 × 10 = 60 or 6 × 10 = 60
So 60 + 60 = 120

Unit 13 Unit: Multiplication (4)

Review

Lesson 1 of 1

Textbook Page : p.170
Actual Lesson 125

Sub-unit Objectives

- To review what have been learnt in the third term.

Lesson Objectives

- To review what have been learnt in the third term.

Prior Knowledge

- To review what have been learnt in the third term.

Preparation

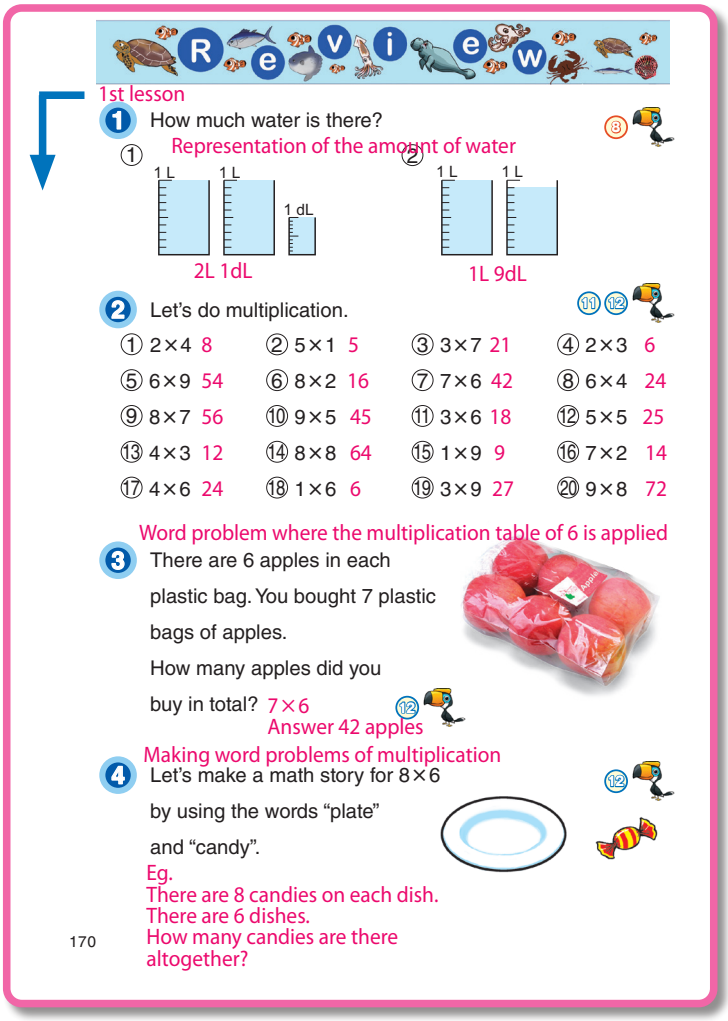
- Sets of quoits (one set per group), flashcards of the enlarged pictures from the textbook, worksheets

Assessment

- To review what have been learnt in the third term. S

Teacher's Notes

This lesson focusses on:
(1) Situations where subtraction is used
(2) Comparison of the sizes of the numbers
Answer: Cassowaries and Dogs
10 cassowaries
9 dogs
(3) Compositions of a numbers:
Compositions of a number 5
Compositions of a number 7
Compositions of a number 10
(4) Ordinal Numbers
From Top
From Bottom
Rabbit
The 3rd



Review

1st lesson

1 How much water is there?

① Representation of the amount of water

1 L 1 L 1 dL

2L 1dL

② 1 L 1 L

1L 9dL

2 Let's do multiplication.

① 2×4 8	② 5×1 5	③ 3×7 21	④ 2×3 6
⑤ 6×9 54	⑥ 8×2 16	⑦ 7×6 42	⑧ 6×4 24
⑨ 8×7 56	⑩ 9×5 45	⑪ 3×6 18	⑫ 5×5 25
⑬ 4×3 12	⑭ 8×8 64	⑮ 1×9 9	⑯ 7×2 14
⑰ 4×6 24	⑱ 1×6 6	⑲ 3×9 27	⑳ 9×8 72

Word problem where the multiplication table of 6 is applied

3 There are 6 apples in each plastic bag. You bought 7 plastic bags of apples. How many apples did you buy in total? 7×6
Answer 42 apples

Making word problems of multiplication

4 Let's make a math story for 8×6 by using the words "plate" and "candy".

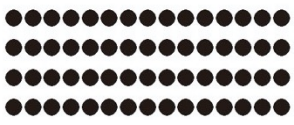
Eg.
There are 8 candies on each dish.
There are 6 dishes.
How many candies are there altogether?

170

p.272 Teacher's Notes

In this lesson you will find that the multiplication expression is with a multiplicand that is more than 9. By applying the prior knowledge about the commutative law of multiplication and rules of multiplication and increasing patterns.

Find the number of dots in the following picture.



Example
The expression is 15×4.
In multiplication, the answer remains the same even when a multiplier and a multiplicand are switched.
So, we can calculate 4×15 instead of 15×4.
By using the multiplication table of 4,
4×9=36
4×15=60 Therefore, 15×4=60
Answer 60 dots

Lesson Flow

REVIEW

1 Find the amount of water by using the units.

T Have the pupils to describe the amount of water by using the units; L and dL.

P Find the amount of water using units.

TN With the problem ②, Teacher checks with pupils how much is the amount indicated by each scale on the 1 L measuring cup.

2 Calculate multiplication

T Let the pupils calculate multiplication.

P Do the multiplication

TN Teacher emphasises that the targets of this activity is not only how accurately pupils can recite the multiplication table but also how fast they can say it. If pupils have not mastered it well yet, Teacher can allocate some time at the beginning of the lesson for pupils to practice it several times.

3 Solve the multiplication story.

T Let the pupils read the presented word problem and recognise that it is the scene where themultiplication table of 6 is applied.
Pupils make a math expression and find the answer.

P Write the math expression and find the answer.

TN Teacher checks whether pupils have understood that there are 6 apples in each bag, for 7 bags, and therefore that the expression should be 6×7.

4 Make a math story for multiplication 8×6.

T Let the pupils make a word problem of multiplication.

P Make a math story for multiplication using the word 'plate' and 'candy'.

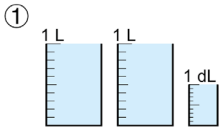
TN Teacher advises pupils to imagine a situation for 8×6 (8 in each, for 6) and has them make a word problem.
Teacher also checks whether the problem made by pupils are in line with the given task.

Sample Blackboard Plan

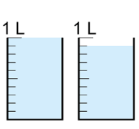
Date: **Chapter 13:** Multiplication (4) **Sub-Chapter 4: Review** **Lesson Number**: 1 of 1

Review

1 How much water is there?

① 

2L 1dL

② 

1L 9dL

2 Let's do multiplication.

① 2×4 8	② 5×1 5	③ 3×7 21	④ 2×3 6
⑤ 6×9 54	⑥ 8×2 16	⑦ 7×6 42	⑧ 6×4 24
⑨ 8×7 56	⑩ 9×5 45	⑪ 3×6 18	⑫ 5×5 25
⑬ 4×3 12	⑭ 8×8 64	⑮ 1×9 9	⑯ 7×2 14
⑰ 4×6 24	⑱ 1×6 6	⑲ 3×9 27	⑳ 9×8 72

3 How many apples did you buy in total?

7 x 6 = 42
Answer: 42 apples



4 Make a math story for 8 x 6 using the words 'plate' and 'candies'.





Example:
There are 8 candies on each dish.
There are 6 dishes.
How many candies are there altogether?

Unit 13

Unit: Multiplication (4)
Have you ever seen it?
Lesson 1 of 1

Textbook Page : p.171
Actual Lesson 126

Lesson Objective

- To discover the idea of subtraction using real life experiences

Prior Knowledge

- Decomposition and composition of numbers up to 10.
- Number to show order and position.

Preparation

- Pictures of math stories, role-play activity using the pictures.

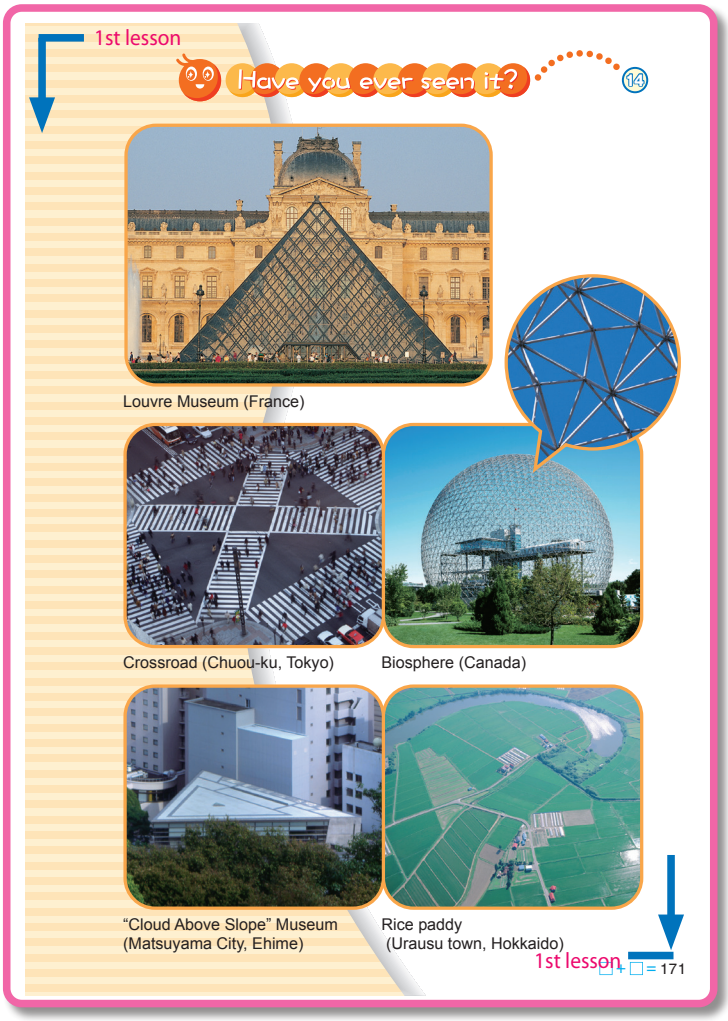
Assessment

- Demonstrate understanding of subtraction using real life experiences. F

Teacher's Notes

Scenes of Subtraction in Our Daily Lives

In this lesson, pupils look at pictures of structures and scenes around the world and discuss with their friends about what they see in the pictures. This activity is about identifying familiar shapes around them that will closely link what pupils see in their daily lives to the learning in the next unit "Triangles and Quadrilaterals".



Lesson Flow

INTRODUCTION

1 Review.

T/P Review key ideas from previous lesson.

BODY

2 Introduce the Main Task.

T Introduce and explain the main task, 'Let's discuss the shapes in these pictures'.

3 Discuss the shapes shown in the pictures.

T/P Let the pupils discuss with their friends what they notice about the pictures on p.171 of the textbook.

TN When we look at the pictures on p.171, we can see there are various shapes.
What kind of shapes do you see in the pictures?

T Select which picture you like and talk about it with your friends what you found out.

P Discuss about the pictures.

P Expected response

- Picture 1 shows that there is a building in the shape of a triangle at Louvre Museum. It looks like many squares are joint together to make the walls of the triangle-shaped building.
- Picture 2 shows that there are triangles in the crossroad.
- Picture 3 shows the Biosphere from Canada is made with many triangles joint together.
- Picture 4 shows the rooftop of "Cloud above Slope" Museum looks like a triangle.
- Picture 5 shows rice paddies have a square shape.
  I wonder the shape of rice paddies is a square everywhere.

TN The term "quadrilateral" is introduced in this unit for the first time. In their daily lives, pupils often use the term "square".
The term itself is not a priority in this page; it is more important to bring about pupils' interests in learning about the shapes.

4 Find various shapes around us.

T/P Let's discuss whether we see shapes in our building structures and landscapes in environment and country as a whole.

T/P Let's discuss with their friends' various shapes they can find in their environment.

TN Instruct the pupils to freely discuss about the pictures they choose from the textbook on page 171; the pictures shows of various shapes of structures of buildings, landscapes,

CONCLUSION

5 Summary.

T/P Summarise the lesson by confirming pupils' understanding of the main ideas in the lesson.

Sample Blackboard Plan

Date: **Chapter 13:** Multiplication (4) **Sub-Chapter 4:** Problems **Lesson Number**: 3/3

Main Task: Let's discuss about the images see in the pictures.

Review

① Review rules and patterns used to make a bigger multiplication table.

Activity

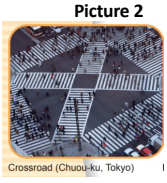
① What do you see?

Picture 1



- Shows that there is a building in the shape of a triangle at Louvre Museum. It looks like many squares are joint together to make the walls of triangles-shaped building.

Picture 2



- Shows that there are triangles in the crossroads.

Picture 3



- Shows the Biosphere from Canada is made with many triangles joint together.

Picture 4



- Shows the rooftop of 'Cloud above Slope' The Museum looks like a triangle.

Picture 5



- Shows rice paddies have a square shape. I wonder the shape is square everywhere.

Summary

- Pictures show the idea of shapes in surroundings around the world.

End of Chapter Test: Chapter 13 **Date:**

Evaluation: Chapter 13 Multiplication (4)	Name:	Score /100

1. Fill in the blanks. [10 points for each blank]

(1) For the answer of the multiplication of 5, the number _____ and _____appear in ones place.

(2) If you add 4 to the answer of 4×2, it becomes the answer to $4 \times$ _____.

2. Fill in the blanks. [10 points for each question]

(1) $5 \times 6 =$ ____ $\times$ 5 (2) $8 \times$ ____ $= 9 \times 8$

(3) ____ $\times$ 7 = 7 $\times$ 8 (4) 4 $\times$ 8 = 8 $\times$ ____

[5 points for each]

3. Write the multiplication that results in the following numbers.

(1) 16 _____, _____, _____

(2) 18 _____, _____, _____

Chapter 14 Triangles and Quadrilaterals

1. Unit Objectives

- Through activities such as observing and composing the shapes of objects, to examine the elements that compose geometrical figures, and develop the understanding about the various geometrical figures.
- To learn about lines.
- To learn about triangles and quadrilaterals, and draw and make them.
- To learn about a right angle, rectangles, squares and right triangles through activities of examining the elements that compose figures.
- To draw and make rectangles, squares and right triangles.

2. Teaching Overview

In this unit, pupils learn about straight lines, triangles and quadrilaterals, right angles, rectangles and squares, and right triangles.

Straight Lines: Pupils acquire the concept of straight lines through activities such as pulling elastic cords and folding paper.

Triangles and Quadrilaterals: As for plane figures, in grade 1, pupils conducted activities such as transferring concrete objects onto a plane and combining triangles to create various shapes and quadrilaterals. Here, through the activity of enclosing sea creatures in straight lines, triangles and quadrilaterals are taken up as shapes surrounded by straight lines, and their definitions and properties are understood.

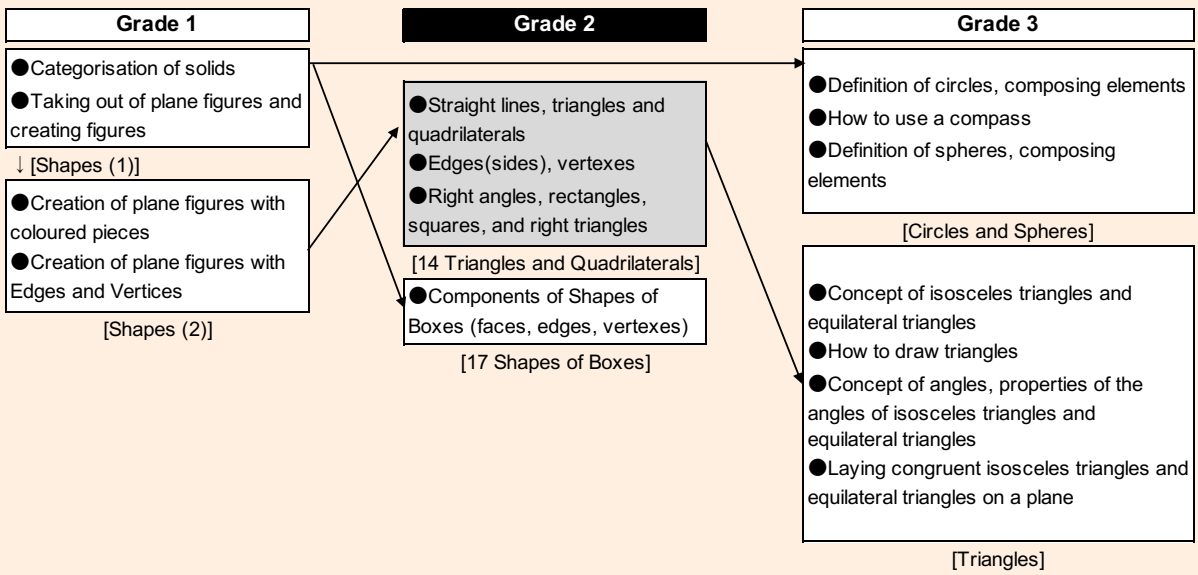
Right Angles: Pupils understand the concept of a right angle by defining a right angle as the shape of a “corner” that can be made by folding an arbitrary plane into four.

Rectangles and Squares: A quadrilateral with four right-angled corners is defined as a rectangle, and a quadrilateral with all four sides of the same length is defined as a square.

Right Triangles: Pupils observe a figure in which a rectangle or square is divided in two by a diagonal line, and define a right triangle based on whether or not the resulting triangle has a right angle.

Key Concepts: Properties of Triangles and Quadrilaterals and the composing elements of lines, edges and angles.

3. Related Learning Contents



Unit 14

Unit: Triangles and Quadrilaterals
Sub-unit: 1. Straight lines
Lesson 1 of 1

Textbook Page : p.172
Actual Lesson 127

Sub-unit Objective

- To learn about the term “straight line” and its concept.

Lesson Objectives

- To understand the difference between straight lines and curved lines by looking at concrete objects.
- To understand that a line that is not curved is called “a straight line”.

Prior Knowledge

- Exploring the differences of the shapes of objects that can easily roll and those that cannot.
- An activity of putting up one object on top of another, to explore the differences of the shapes of objects that can be easily piled up and those that cannot.

Preparation

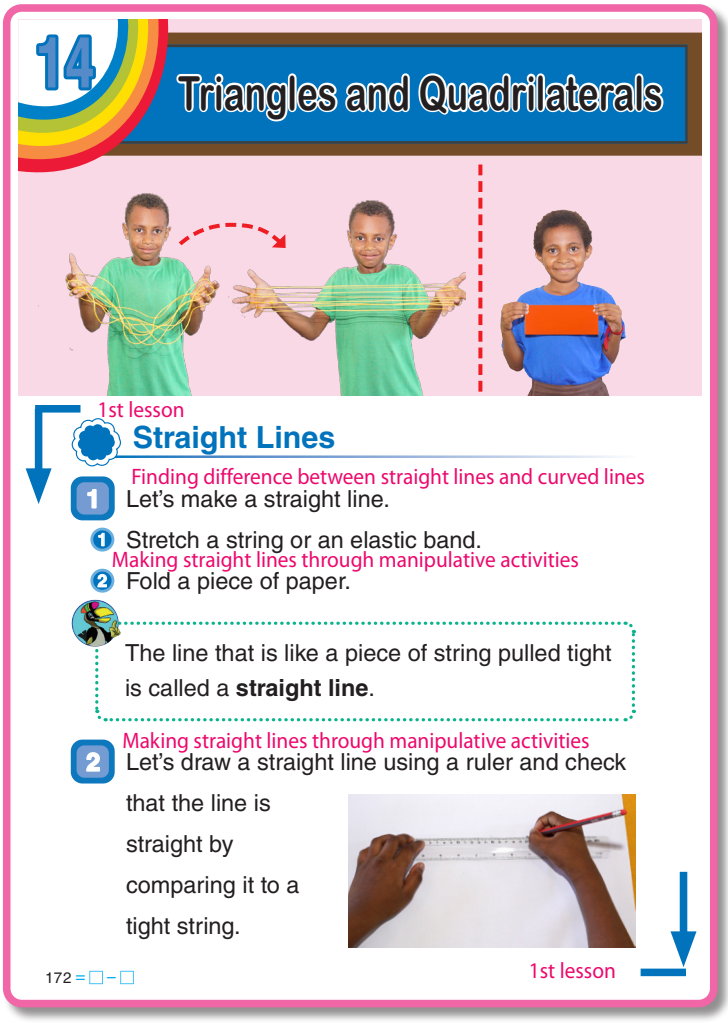
- String, elastic string, coloured paper, copy paper, ruler.

Assessment

- Find the difference between straight lines and curved lines by looking at concrete objects. F
- Make straight lines through manipulative activities. F
- Draw straight lines with a ruler. F S

Teacher’s Notes

Through activities such as observing and composing the shapes of objects, to examine the elements that compose geometrical figures, and develop the understanding about the various geometrical figures.
Finding difference between straight lines and curved lines.
Making straight lines through manipulative activities.
Drawing straight lines with a ruler.



Lesson Flow

INTRODUCTION

1 Review.

T/P Study the images of structures and landscapes around the world and see what they can find.

T What common shapes can you identify from these pictures?

P Review known knowledge from previous lessons by identifying different shapes.
Expected responses;

- Louvre Museum, Canada (Triangle)
- Crossroad, Tokyo (Rectangle, triangle)
- Biosphere, Canada (round, circular)
- Cloud Above Slope Museum (triangle, rectangle)
- Rice Paddy (rectangle)

BODY

2 Introduce the Main Task

T Introduce and explain the main task "Let's make straight lines using different ideas".

3 1 Making two different lines using a string

T Look at the picture of a boy holding a string on p.172. Ask pupils to note that there are two different lines: Stretched lines and upstretched lines

T/P Let's pick up a long string and make some shapes with it. Write down in your exercise books what you notice about how the string changes its shape.

TN Teacher can have each pupil to play with a string and make various shapes. It is a good introduction for pupils to realize that they have to straighten the string when trying to make various shapes properly.

4 Make straight lines with elastic bands and papers.

T 1-2 Let the students make straight lines with elastic strings and papers.

P Make straight lines with elastic strings and papers.

TN While it is important for pupils to think individually, it is also effective to make groups and have them learn from each other in a group. Pupils learn about different ideas and ways of making lines from their friends.

TN Teacher introduces to pupils the term "a straight line".

5 2 Use a ruler to draw straight lines.

T Get the pupils to draw a straight line using a ruler and check that the line is straight by comparing it to a tight string.

P Learn the use of a ruler as a tool to draw straight lines.

CONCLUSION

6 Summary.

T/P Summarise the lesson by confirming pupils' understanding of the main ideas in the lesson.

Sample Blackboard Plan

Date: **Chapter 14:** Triangles and quadrilaterals **Sub-Chapter 1:** Straight lines **Lesson Number:** 1/1

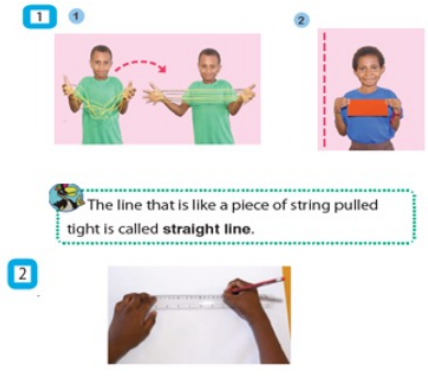
Main Task: Let's make straight lines using different ideas.

Review

What common shapes can you identify from these pictures?

- Louvre Museum, Canada (Triangle)
- Biosphere, Canada (round, Circular)
- Cloud Above Slope Museum (triangle, rectangle)
- Rice Paddy (rectangle)

Activity



Straight lines Around Us

- Side of the book
- Edge of the door
- Power line

Summary

- Stretch or pull the string tight to create a straight line.
- Use ruler to draw a straight line.

Unit 14

Unit: Triangles and Quadrilaterals
Sub-unit: 2. Triangles and Quadrilaterals
Lesson 1 of 4

Textbook Page : p.173
Actual Lesson 128

Sub-unit Objectives

- To find triangles and quadrilaterals from their surrounding objects.
- To learn about the definitions of triangle and quadrilateral, and to classify the shapes accordingly as well as draw the shapes correctly.

Lesson Objectives

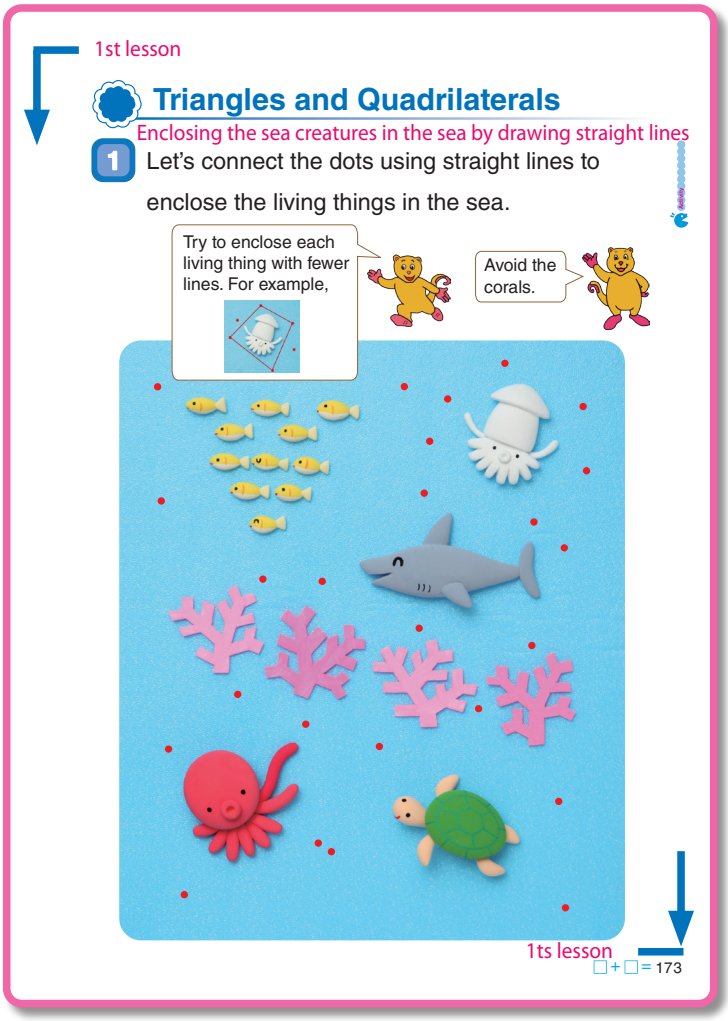
- To become interested in triangles and quadrilaterals and draw lines to enclose creatures.
- To construct triangles and quadrilaterals by drawing lines.

Prior Knowledge

- Grouping objects and animals in the pictures.
- Grade 1 U17. Shapes (2) and connecting dots.

Preparation

- Enlarged picture from the textbook p.172, rulers, digital textbook software (if available).



Assessment

- Enclose objects by drawing straight lines. F
- Identify triangles and quadrilaterals from their surrounding objects. F S
- Construct a variety of triangles and quadrilaterals on the geoboards. F

Teacher's Notes

How to teach with geoboards
As activities to identify triangle and quadrilateral shapes, one way to do it is to have pupils find the triangle and quadrilateral shapes in the pictures from the textbook.
Another way is to have them make various shapes of things around themselves on the geoboards and identify the shapes that are triangle and quadrilateral from what they made.
Moreover, in order to clarify the concepts of triangle and quadrilateral, teacher have the pupils make a variety of triangles and quadrilaterals on the geoboards.
Through such manipulative activities, pupils will gradually understand the basic points of a triangle such as: 1) they can put an elastic band on 3 nails to make a triangle (thus, they can make a triangle when there are 3 nails); and 2) the band should be pulled tight. In this way, teacher can draw the pupil's attention to the elements of the shape, namely the vertex and sides.
Quadrilaterals can be taught in the similar way.

Lesson Flow

INTRODUCTION

1 Review.

T/P Review key ideas from previous lesson.

BODY

2 Introduce the Main Task.

T Introduce and explain the main task, "Let's connect the points using straight lines to enclose the sea creatures."

3 1 Draw lines to enclose the sea creatures in the sea.

T/P Can you see the red dots in the picture? These are the points that you will connect to make an enclosure for each of the sea creatures.

T Let the pupils decide on some basic rules that they will use to make the enclosure.

P Think of the rules for making an enclosure and discuss with the class.

TN Teacher can use some of this rules to start them of.

- Try to use fewer lines when making each enclosure.
- Draw lines without touching or crossing over the sea creatures.
- Draw lines with a ruler.
- Avoid crossing over the corals

T Use the rules discussed to enclose the sea creatures.

P Work individually to connect the points by drawing straight lines to enclose the sea creature.

TN Teacher checks each pupil's work to see if they are following the set rules, and provides guidance where necessary.

P Examine the shapes they made.

TN Teacher has pupils realise that when they draw lines following the set rules, they will get triangle-shaped enclosure for the fish and the turtle and quadrilateral-shaped enclosure for the cuttlefish, octopus and shark.

T Were you able to connect the red dots with straight lines and enclose each of them in a cage?

P Pupils check to make sure that the rules set were carefully followed to complete the activity.

CONCLUSION

4 Summary.

T/P Summarise the lesson by confirming pupils' understanding of the main ideas in the lesson.

Sample Blackboard Plan

Date: **Chapter 14:** Triangles and quadrilaterals **Sub-Chapter 2:** Triangles and Quadrilaterals **Lesson Number:** 1/4

Main Task: Let's connect the points using straight lines to enclose the creatures.

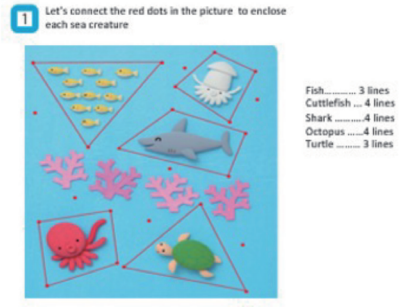
Review

- Stretch or pull the string tight to create a straight line.
- Use ruler to draw a straight line.

Activity

Rules:

1. Draw lines without touching or crossing over the sea creatures.
2. Try to use fewer lines when making each.
3. Use straight lines.
4. Draw lines with a ruler



Summary

- We enclosed the creatures by connecting with straight lines.
- Three straight lines connected make a triangle.
- Four straight lines connected make a quadrilateral.
- A ruler is used to draw straight lines.

Unit 14

Unit: Triangles and Quadrilaterals
Sub-unit: 2. Triangles and Quadrilaterals
Lesson 2 of 4

Textbook Page : p.174~175
Actual Lesson 129

Lesson Objectives

- To learn that the shape enclosed with 3 straight lines is called “a triangle”.
- To learn that the shape enclosed with 4 straight lines is called “a quadrilateral”.
- To draw triangles and quadrilaterals by drawing 3 and 4 straight lines.

Prior Knowledge

- Triangles and quadrilaterals, and drawing lines to enclose the sea creatures on p.174.

Preparation

- Enlarged picture of p.174, ruler.

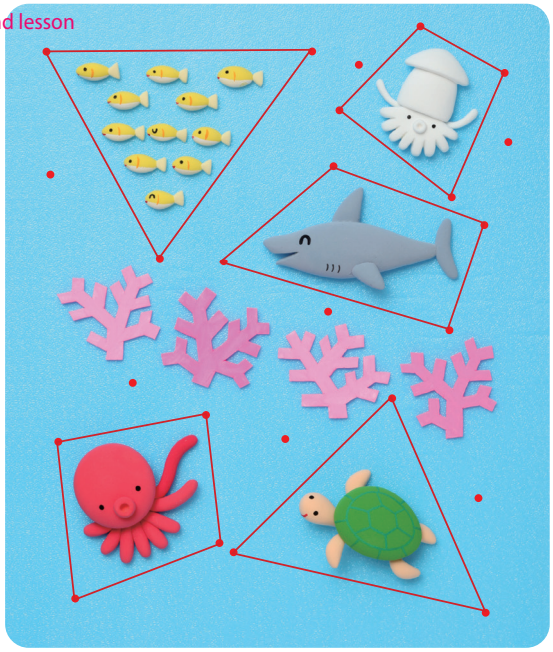
Assessment

- Group triangles and Quadrilaterals. F
- Identify objects enclosed with 3 straight lines and four straight lines. F

Teacher’s Notes

Teaching Tips: Triangles and Quadrilaterals
When pupils deal with the shapes “triangles” and “quadrilaterals”, they should be able to examine and classify the shapes based on the elements (vertices and sides).
As the shapes shown in this textbook are regular triangles and quadrilaterals which have straight lines (sides) with all the vertices connected, pupils may not be conscious about the differences between what they call “triangle” and “square” in daily lives and those in mathematics. Therefore, in lessons, Teacher should bring in the charts as stated below and create a moment in lessons for pupils to compare and examine the differences.
Teacher should also reinforce to pupils that a shape should be a closed shape with straight lines connecting all the vertices when we say “enclosed with straight lines”.

2nd lesson



Grouping triangles and quadrilaterals

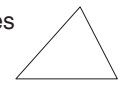
2 Let’s separate the shapes that are made by straight lines into 2 groups.

Enclosed with 3 straight lines - fish, turtle
Enclosed with 4 straight lines - cuttlefish (squid), octopus, shark

174 = □ − □

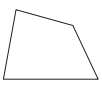
Definition of triangles

The shape enclosed by 3 straight lines is called a **triangle** (or **triangular**).



Definition of quadrilaterals

The shape enclosed by 4 straight lines is called a **quadrilateral** (or **quadrangular**).

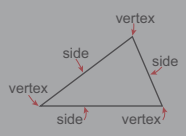




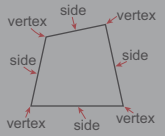


2nd lesson

The corner point of triangles and quadrilaterals is called a **vertex** and the straight line that connects two vertices is called a **side**.



In a triangle, the number of sides is □, the number of vertices is □.



In a quadrilateral, the number of sides is □, the number of vertices is □.

□ + □ = 175

Lesson Flow

INTRODUCTION

1 Review.

T/P Review key ideas from previous lesson.

BODY

2 Introduce Main Task.

T Introduce and explain the main task, "Let's separate the shapes that are enclosed by straight lines into 2 groups".

3 Identify the enclosed shapes drawn.

T Let the pupils review and compare their own work. What shape did you draw for each sea creature?

S Compare their own work with that of their friends.

TN Pupils drew lines to enclose the sea creatures. Have them recognize and identify the enclosed shapes as shown on p.174 of the textbook.

4 2 Separate shapes into 2 groups.

T Ask the pupils to study the enclosed shapes of the sea creatures that they have drawn and separate the shapes into two groups.

P Recognise that the fish is enclosed with 3 straight lines; so is the turtle.
Also recognize that the cuttlefish is enclosed with 4 straight lines; so as the shark and the octopus.

TN Tell pupils to check whether the lines they drew on their own are really straight.
Teacher tells them to check the lines, not by assuming from how they appear, but through manipulations, i.e. placing a ruler or other straight objects (a string or paper side) to the lines.

5 Definition of triangle and quadrilateral.

T Get the pupils to read and learn the definition of triangles.

P Read and learn the definition of a triangle.

TN Teacher explains to pupils not only the definition but also how to distinguish the shape; the shape enclosed with 3 straight lines is a triangle.

T Get the pupils to read and learn the definition of quadrilaterals.

P Read and learn about the definition of a quadrilateral.

TN Teacher explains to pupils not only the definition but also how to distinguish the shape; the shape enclosed with 4 straight lines is a quadrilateral.

P Pupils write down the definitions of a triangle and a quadrilateral in their exercise books.

CONCLUSION

6 Summary.

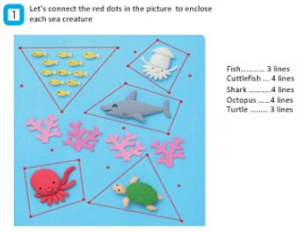
T/P Summarise the lesson by confirming pupils' understanding of the main ideas in the lesson.

Sample Blackboard Plan

Date: **Chapter 14:** Triangles and quadrilaterals **Sub-Chapter 2:** Triangles and Quadrilaterals **Lesson Number:** 2/4

Main Task: Let's separate the shapes that are enclosed by straight lines into two groups.

Review



- We enclosed the creatures by connecting with straight lines.
- Three straight lines connected make a triangle.
- Four straight lines connected make a quadrilateral.
- A ruler is used to draw straight lines.

Activity

2 Separating shapes into groups

3 lines	4 lines
• Fish • Turtle	• Cuttlefish • Shark • Octopus

The shape enclosed by 3 straight lines is called **triangle** (or **triangular**).

The shape enclosed by 4 straight lines is called **quadrilateral** (or **quadrangular**).

Summary

- The shape enclosed by 3 straight lines is called a triangle.
- The shape enclosed by 4 straight lines is called a quadrilateral.
- Enclosed with 3 straight lines are fish and turtle.
- Enclosed with 4 straight lines are cuttlefish, octopus and shark.

Unit 14

Unit: Triangles and Quadrilaterals
Sub-unit: 2. Triangles and Quadrilaterals
Lesson 3 of 4

Textbook Page : p.175~176
Actual Lesson 130

Lesson Objectives

- To learn about vertices and sides as elements composing a triangle and a quadrilateral.
- To draw triangles and quadrilaterals by setting vertices and connecting them with straight lines.

Prior Knowledge

- Shapes enclosed with 3 straight lines are called "a triangle."
- Shapes enclosed with 4 straight lines are called "a quadrilateral."
- Drawing triangles and quadrilaterals by drawing 3 and 4 straight lines.

Preparation

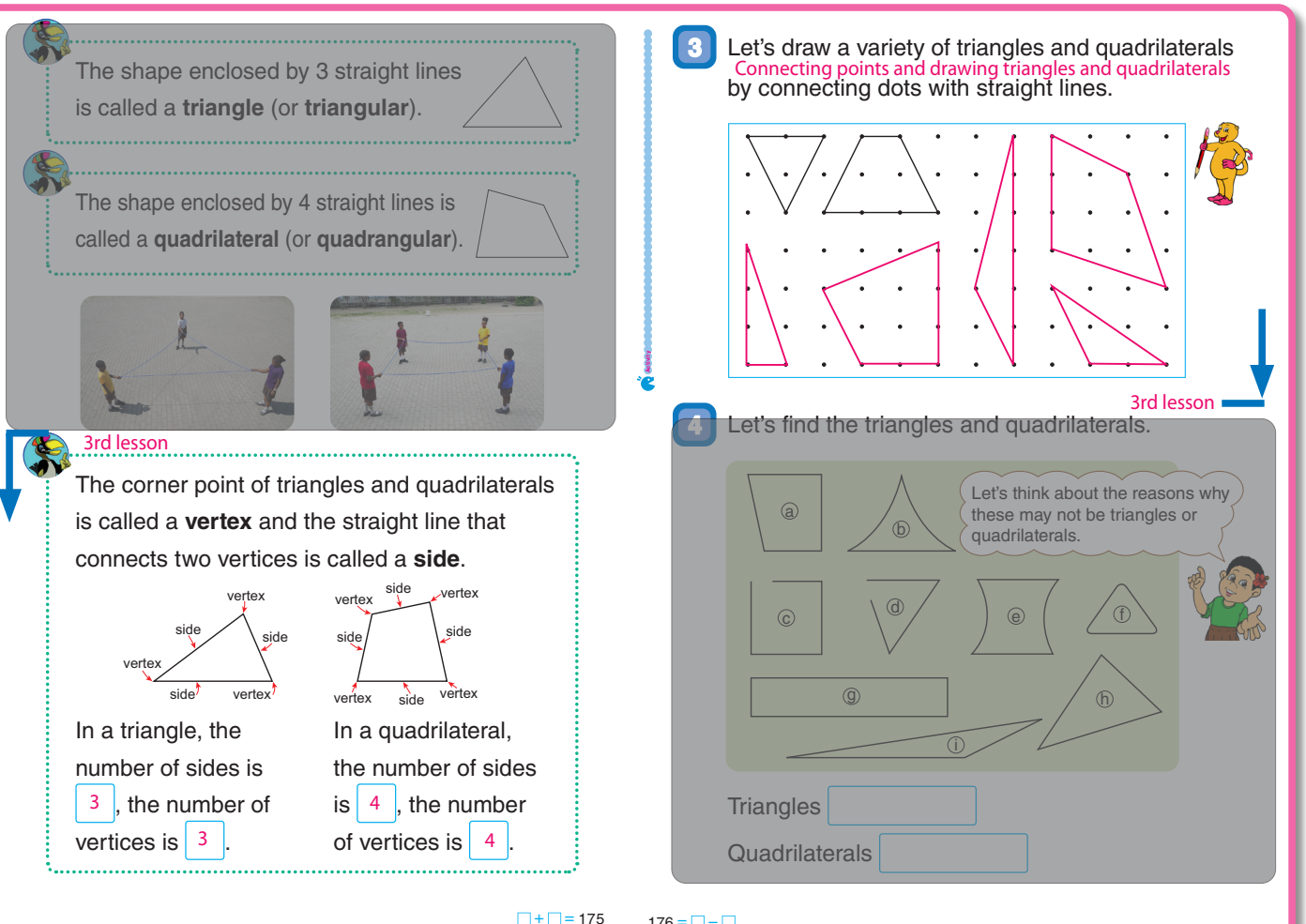
- Ruler, color pencils, worksheets, digital textbook software (if available).

Assessment

- Connect points and draw triangles and quadrilaterals. F

Teacher's Notes

Connecting points and drawing triangles and quadrilaterals. Begin with connecting the dots to form these shapes.
Make it fun and engaging.
Explain the idea of sides and corners (vertices) for each shape.
For example, a triangle has 3 sides and 3 corners.



Lesson Flow

INTRODUCTION

1 Review.

T/P Review key ideas from previous lesson.

BODY

2 Introduce the Main Task

T Introduce and explain the main task, "Let's identify the vertices and sides of a triangle and a quadrilateral."

3 ③ Draw a triangle and a quadrilateral using their prior knowledge.

T Get the pupils to draw a triangle and quadrilaterals in their exercise books.

P Draw a triangle and a quadrilateral.

TN In order to reinforce the learning ideas from the previous lesson about the elements composing a triangle and a quadrilateral, Teacher should ensure pupils draw the two shapes following the definitions they learned.

4 Identify vertices and sides as elements of composing a triangle and a quadrilateral.

T Get the pupils to read and learn the definition of vertex and side.

P Read and learn the definition of vertex and side.

TN Teacher guides pupils to realise that once they set 3 or 4 points as vertices, they can easily and quickly draw the sides to form a triangle or a quadrilateral

T Get the pupils to draw a triangle and a quadrilatera by connecting 3 or 4 vertices with straight lines.

P Draw the triangle and quadrilateral by connecting the dots with straight lines.

TN Teacher tells pupils to first decide which 3 points and which 4 points they will connect, and start to practice drawing them several times.

5 Exercise

T Get the pupils to draw various triangles and quadrilaterals by connecting points with straight lines.

P Do the exercise.

P Open up the textbooks to p.176 and work individually.
Draw triangles and quadrilaterals by connecting points with straight lines.

TN Teacher has pupils realise that they can draw a triangle by setting 3 points to be connected and a quadrilateral by setting 4 points to be connected.

T/P Correct the exercise

CONCLUSION

6 Summary.

T/P Summarise the lesson by confirming pupils' understanding of the main ideas in the lesson.

Sample Blackboard Plan

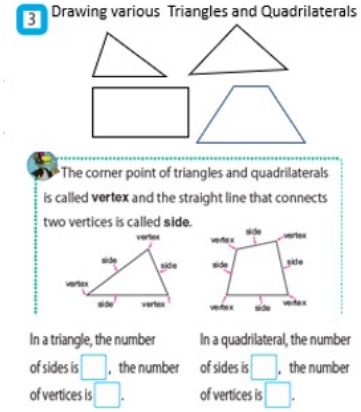
Date: **Chapter 14:** Triangles and quadrilaterals **Sub-Chapter 2:** Triangles and Quadrilaterals **Lesson Number:** 3/4

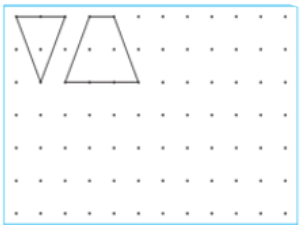
Main Task: Let's identify the vertices and sides of a triangle and a quadrilateral.

Review

- The shape enclosed by three straight lines is called a triangle.
- The shape enclosed by four straight lines is called a quadrilateral.
- Enclosed with 3 straight lines are fish and turtle.
- Enclosed with 4 straight lines are cuttlefish, octopus and shark.

Activity





Summary

- The corner point of triangles and quadrilaterals is called vertex.
- The straight line that connects the two vertices is called sides.
- Connecting points to draw triangles and quadrilaterals.

Unit 14

Unit: Triangles and Quadrilaterals
Sub-unit: 2. Triangles and Quadrilaterals
Lesson 4 of 4

Textbook Page : p.176~177
Actual Lesson 131

Lesson Objectives

- To distinguish triangles and quadrilaterals from various shapes formulated with either 3 or 4 lines.
- To play a “capture the points” game.

Prior Knowledge

- Vertices and sides as elements composing a triangle and a quadrilateral.
- Drawing triangles and quadrilaterals by setting vertices and connecting them with straight lines.

Preparation

- Ruler, color pencils, worksheets, digital textbook software (if available).

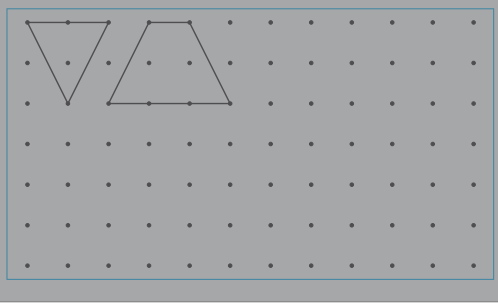
Assessment

- Distinguishing triangles and quadrilaterals from various shapes formulated with either 3 or 4 lines. F

Teacher’s Notes

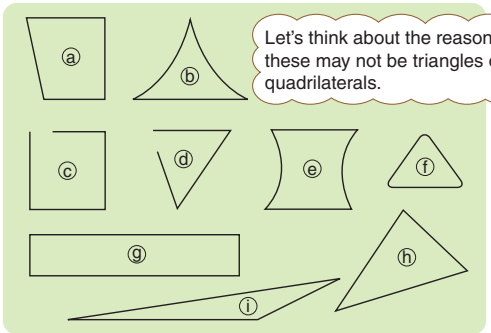
Sticks are useful to teach and learn about sides and recognise the number of sides composing a certain shape.
However, because of the focus on side and lines, sticks can weaken the recognition of vertices to some extent.
Dots can be put in a grid pattern on any piece of paper. It is effective for pupils to imagine what the shapes look like and visualise the shapes as they connect the dots.
Advantage of using dot sheets is that pupils can plan how to make shapes by reviewing the definitions and properties of shapes.

3 Let’s draw a variety of triangles and quadrilaterals by connecting dots with straight lines.





4 Let’s find the triangles and quadrilaterals.
4th lesson





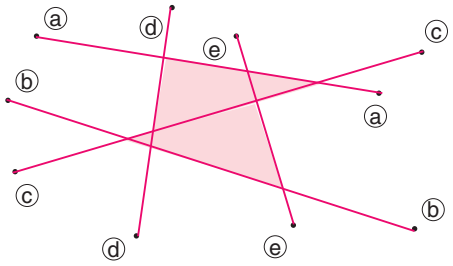
Triangles ⓗ ⓘ

Quadrilaterals ⓐ ⓖ

Exercise

Let’s connect the dots with the same letters with a straight line using a ruler.

And let’s colour the triangles and quadrilaterals.

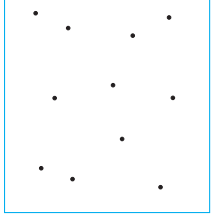


‘Capture the Dots’ Game

① To be played by 2 to 3 persons.
② Draw a straight line to connect dots when you win by playing rock, scissors and paper.
③ When a triangle is made, colour the inside.
④ The person who makes the most triangles wins.

Prepare

Make many dots on the paper.



176 = □ − □

4th lesson
□ + □ = 177

Lesson Flow

INTRODUCTION

1 Review.

T/P Review key ideas from the previous lesson.

BODY

2 Introduce the Main Task.

T Introduce and explain the main task, "Let's find the triangles and quadrilaterals".

T Let the pupils study the various shapes from ⓐ to ⓘ and identify triangles and quadrilaterals.

TN Teacher instructs pupils to start from (a) and categorise them into one of the three groups.

3 4 Find the triangles and quadrilaterals.

T Let the pupils study the various shapes from ⓐ to ⓘ and identify triangles and quadrilaterals and categorise them into one of the three groups- "triangle", "quadrilateral" or "others".

P Work individually and categorise the shapes into the three groups.

P Present work and give reasons why the shapes may be a triangle or a quadrilateral and write their ideas in their exercise books.

T/P When explaining the reasons, pupils should present the reasons based on and in reference to the definitions of a triangle and a quadrilateral. Let the pupils also think about the reasons why others may not be triangles or quadrilaterals.

TN For ⓑ ⓒ ⓓ ⓔ ⓕ, reaffirm with pupils as to why those shapes cannot be either a triangle nor a quadrilateral.

T Were you able to categorise the shapes correctly?

P Share their experience.

T Were you able to explain the reason also?

P Share their experience

4 Exercise.

T Get the pupils to do the activities in exercise.

P Do the exercise. Connect the points with the same letters.

T/P Correct the exercise

T Ask the pupils to share their findings of what shapes they discovered.

P Share their findings of the shapes and color the triangles in red and the quadrilaterals in blue.

5 "Capture the Points" Game.

T Get the pupils to play the "Capture the Points" Game.

P Play the "Capture the Points" Game.

TN While enjoying playing the game, pupils should be able to recognise the sides and vertices as the important elements of a triangle.

TN Through an activity of coloring the shapes, pupils should be able to recognise again that a triangle is the shape enclosed with straight lines.

CONCLUSION

6 Summary.

T/P Summarise the lesson by confirming pupils' understanding of the main ideas in the lesson.

Sample Blackboard Plan

Date: **Chapter 14:** Triangles and quadrilaterals **Sub-Chapter 2:** Triangles and Quadrilaterals **Lesson Number:** 4/4

Main Task: Let's group the shapes into triangles, quadrilaterals and others.

Review

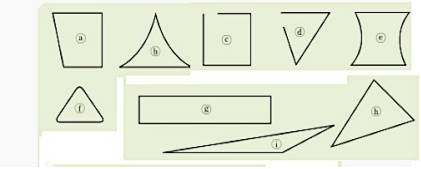
- The corner point of triangles and quadrilaterals is called vertex.
- The straight line that connects the two vertices is called sides.

Triangles : 2 Quadrilaterals : 2

Triangle	h , i	Enclosed with 3 straight lines.
Quadrilateral	a, g	Enclosed with 4 straight lines.
Others	b, e, f	Curved lines. Not enclosed with straight lines
	c, d	Spaces. Not Completely closed.

Activity

4 Let's find the triangles and quadrilaterals.



Exercise

Let's connect the dots with the same letters with a straight line using a ruler.
And let's colour the triangles and quadrilaterals.



Summary

- Shape *h* and *i* are triangles. They are enclosed with 3 straight lines.
- Shape *a* and *g* are quadrilaterals. They are enclosed with 4 straight lines.
- Others
  - (b, e, f) Curved lines. Not enclosed with straight lines
  - (c, d) Spaces. Not completely closed.

Unit 14

Unit: Triangles and Quadrilaterals
Sub-unit: 3. Right Angles
Lesson 1 of 2

Textbook Page : p.178
Actual Lesson 132

Sub-unit Objectives

- To examine various shapes with particular attention to the shapes of corners which are also the elements composing geometric figures, and think about the differences and similarities in various shapes.
- To understand the concept of a right angle through activities of folding a sheet of paper and finding or making right angles.

Lesson Objectives

- To understand the concept of a right angle though a manipulative activity of folding an irregularly-shaped sheet of paper.
- To find right angles in the environment and deepen the understanding of right angles by using the right angle made with an irregularly-shaped sheet of paper.

Prior Knowledge

- Distinguishing triangles and quadrilaterals from various shapes formulated with either 3 or 4 lines.
- Playing the “capture the points” game.

Preparation

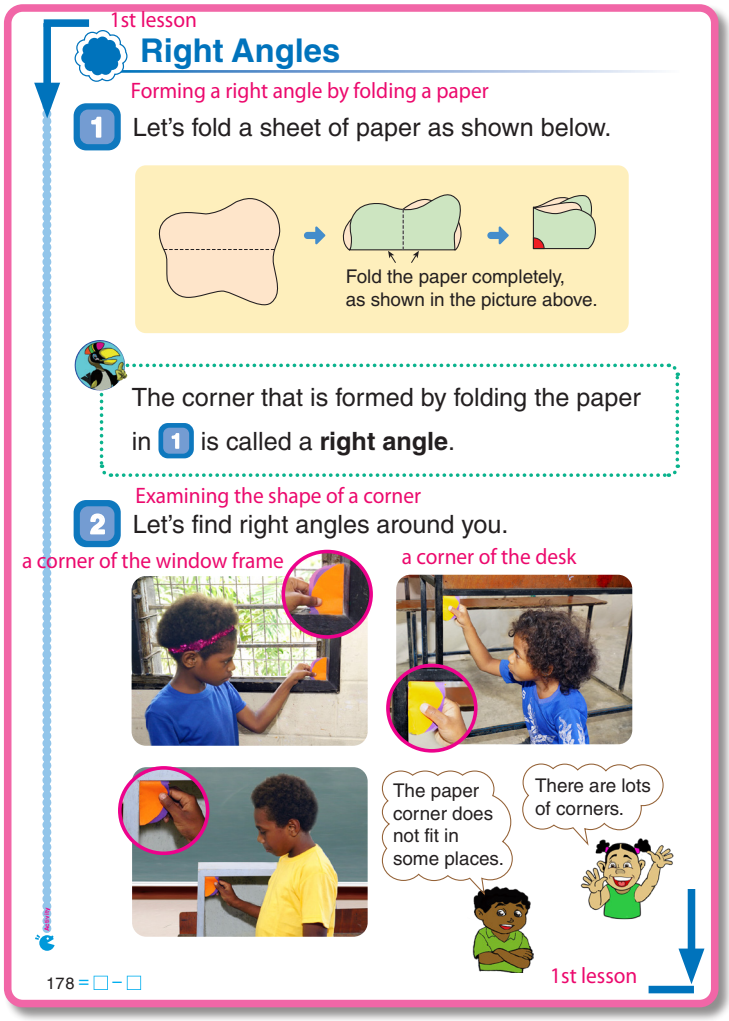
- Paper, scissors

Assessment

- Form right angles by folding a paper. F
- Examine the shape of corners of objects that have a right angle. F S

Teacher’s Notes

In this lesson, pupils are to fold any sheet of paper to identify that the corner formed by folding is called a ‘right angle.’
Pupils will then use the folded paper to find objects or examples of right angles around them either in the classroom or outside.
Teacher may assist when pupils have difficulties in finding such objects.



Lesson Flow

INTRODUCTION

1 Review.

T/P Review key ideas from previous lesson.

BODY

2 Introduce the Main Task.

T Introduce and explain the main task, "Let's fold an unshaped sheet of paper to form a right angle."

3 1 Find right angles by folding an unshaped sheet of paper.

T Get the pupils to look at the instruction on p.178 and fold an unshaped sheet of paper.

P Fold the paper completely as instructed. Press and fold it firmly.

TN When pupils finish folding the paper, draw their attention to the corner and have them color or put a mark on it (as shown in the picture below). Teacher can give pupils various sheets of paper in different shapes and have them realise that when folded in four, all the sheets of paper get the same shaped corners.

T Show and tell the students that, the corner that is formed by folding the paper is called the right angle.

4 2 Find right angles in the surrounding.

T Get the pupils to find right angles around them using the folded paper that they have made in the previous activity.

P Look for corners that have the same shape as the folded paper and explain that they are "a right angles".

T Advise pupils to look at the pictures in the textbook on p.178. Be careful with how to hold the paper when placing it and examining the shapes.

TN While pupils examine and find right angles, Teacher can present some examples of things that the paper corner does not fit; either they are larger or smaller.
Through this activity, pupils will start to find it easy to identify right angles around themselves and soon be able to make assumptions before actually placing the paper corner.

P Examine and identify right angles around them to affirm. Learn the term "a right angle" and understand its concept.

TN Teacher can go over the corners that pupils found in the previous activity and explains that it is called "a right angle". Teacher also clarifies with pupils the shapes that are not right angles.

CONCLUSION

5 Summary.

T/P Summarise the lesson by confirming pupils' understanding of the main ideas in the lesson.

Sample Blackboard Plan

Date: **Chapter 14:** Triangles and quadrilaterals **Sub-Chapter 3:** Right Angles **Lesson Number:** 1/2

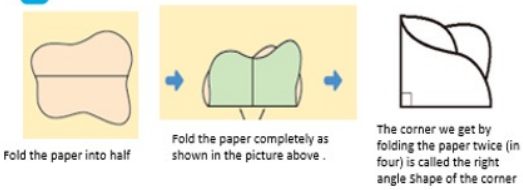
Main Task: Let's fold an unshaped sheet of paper to find a right angle.

Review

- Shape *h* and *i* are triangles. They are enclosed with 3 straight lines.
- Shape *a* and *g* are quadrilaterals. They are enclosed with 4 straight lines.
- Others
  - (b, e, f) Curved lines. Not enclosed with straight lines
  - (c, d) Spaces. Not completely closed.

Activity

1



The corner that is formed by folding the paper is called right angle

2 Let's find Right angles around us
- Corner of the blackboard
- Corner of the window
- Corner of the locker
- Corner of the exercise book
- Corner of the classroom

Summary

- The corner that is formed by folding the paper is called right angle.
- **Examples of Right angles around us;**

✓ Corner of the blackboard,
✓ Corner of the window,
✓ Corner of the locker,
✓ Corner of the exercise book,
✓ Corner of the classroom

Unit 14

Unit: Triangles and Quadrilaterals
Sub-unit: 3. Right Angles
Lesson 2 of 2

Textbook Page : p.179
Actual Lesson 133

Lesson Objectives

- To deepen the understanding of right angles by putting together a set-square.
- To form right angle formed by folding unshaped paper.
- To draw a right angle using a set-square.

Prior Knowledge

- Understanding the concept of a right angle through a manipulative activity of folding an irregularly-shaped sheet of paper.
- Using the right angle made with an irregularly-shaped sheet of paper, to find right angles in pupils' environment and deepen the understanding of right angles.

Preparation

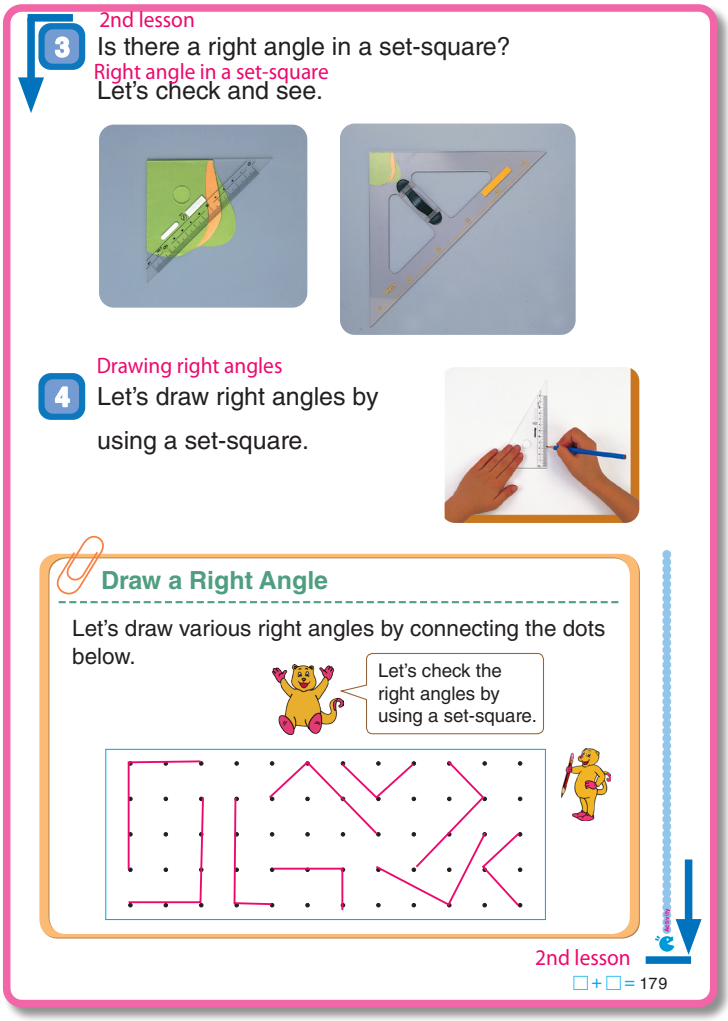
- Large size set-square (for Teacher's demonstration)

Assessment

- Find right angle in a set square. F S
- Draw right angles. F S

Teacher's Notes

1. Teacher should try to draw pupils' attention to the shape of "right angle" on various occasions. When pupils use a set-square, for example, Teacher can have them identify a right angle in it and put a small sticker or mark on the corner.
2. Teacher can let pupils place a set-square on various things around themselves to find right angles. This activity can be done regularly so that the concept of right angle can be grasped by pupils.
3. Teacher can have pupils use two set-squares and have them practice sliding one along the side of the other.
   This kind of manipulation can be utilised later in the upper grades when drawing various geometric figures.
4. Teacher can have pupils trace the shapes of set-squares to see how the two sides of a triangle meet at a corner, and reinforce their understanding of a corner as one of the elements composing a geometric figure.



Lesson Flow

INTRODUCTION

1 Review.

T/P Review key ideas from previous lesson.

BODY

2 Introduce the Main Task.

T Introduce and explain the main task "Let's find right angles in a set square."

3 3 Let's find right angles in a set square.

T Let pupils examine if there is a right angle in a set square.

P Place the right angle they formed from the previous lesson to a set-square and examine it.

TN Teacher can advise pupils to place a set-square on the folded paper made in activity 1 or open up the paper and place the corner of a set-square on a right-angle fold in the paper.

4 4 Let's draw right angles using a set square.

T Let pupils draw right angles using a set square.

P Explore ways of drawing a right angle in their own creative ways.

TN Teacher should pay attention to how pupils are drawing each line.
There may be some pupils who will draw two sides without paying much attention to how the corner looks like.
Such pupils will tend to draw a curved corner.
In such cases, Teacher should advise them to draw the lines one at a time making sure that where the two straight lines meet, a vertex should be formed.

TN Teacher tells pupils to draw right angles in various ways; pupils can place a set-square in various directions or turn their exercise books.

T Using the sample of dots on a p.179 of the textbook, let the pupils to connect the dots and draw right angles

P Draw right angles in various sizes and directions by connecting the dots.

TN When pupils finish drawing, Teacher instructs them to place the right angle that they made in the activity 1 of the previous lesson to see if the angles they drew this time matches with it properly.

TN Teacher advises pupils to find and connect the dots that can form right angles in various directions; connecting dots horizontally, vertically, diagonally, etc.

T/P Check the right angles by using a set square.

CONCLUSION

5 Summary.

T/P Summarise the lesson by confirming pupils' understanding of the main ideas in the lesson.

Sample Blackboard Plan

Date: **Chapter 14:** Triangles and quadrilaterals **Sub-Chapter 3:** Right Angles **Lesson Number:** 2/2

Main Task: Let's find right angles in a set square.

Review

- The corner that is formed by folding the paper is called right angle.
- Examples of Right angles around us are;

Corner of the blackboard, Corner of the window, Corner of the locker, Corner of the exercise book, Corner of the classroom

4 Drawing Right angles using a set square.



Place your hand firmly on a ruler and draw lines

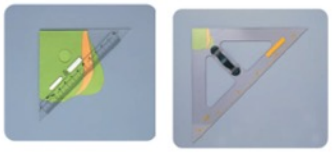
Summary

- The set-square contains right angle.
- Draw various right angles by connecting dots.

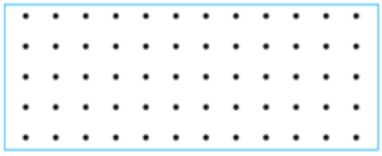
Activity

Right angles in a set square.

3



Let's draw various right angles by connecting the dots.



Unit 14

Unit: Triangles and Quadrilaterals
Sub-unit: 4. Rectangles and Squares
Lesson 1 of 3

Textbook Page : p.180
Actual Lesson 134

Sub-unit Objectives

- To classify geometric figures according to the composing elements of the shapes, and understand the importance and usefulness of mathematical approaches (i.e. solving problems utilising related information such as definitions and given conditions).
- To examine various geometric figures with particular attention to their "sides", "vertices", and "corners", and think about differences, similarities and properties among those figures.
- To distinguish rectangles and squares, and draw them properly with particular attention to their composing elements.
- To understand the definitions and properties of rectangles and squares.

Lesson Objectives

- To distinguish rectangles from various shapes with attention to right angles in the shapes.
- To learn about the definition of a rectangle and its meaning.

Prior Knowledge

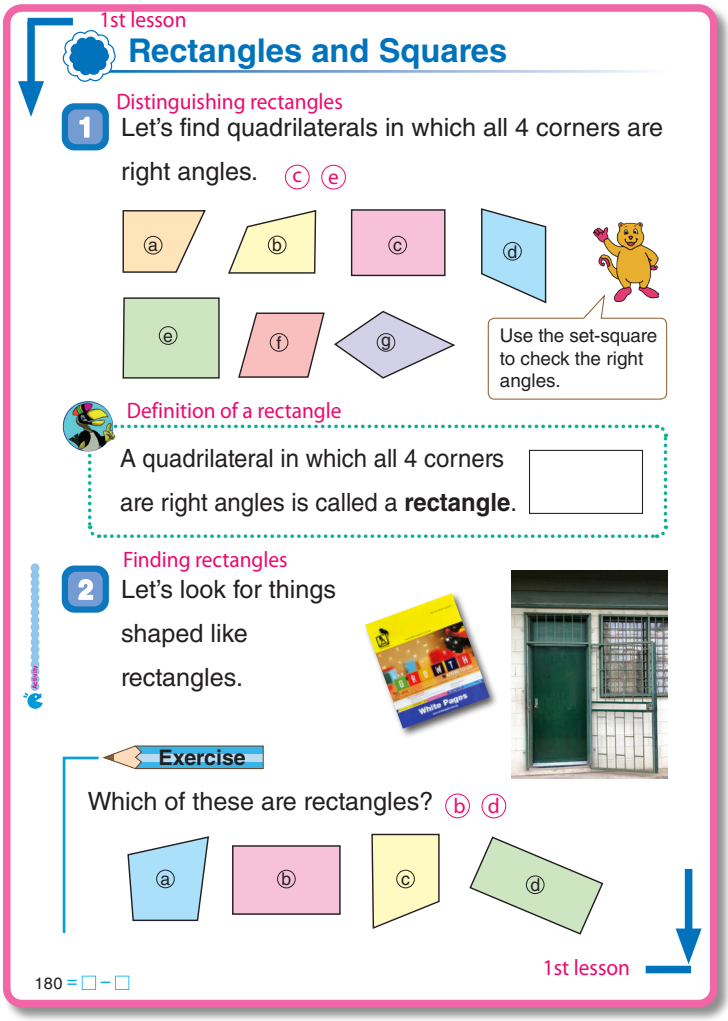
- Understanding of right angles through various activities: by putting together a set-square and the right angle formed by folding the unshaped paper in the previous lesson, or by drawing a right angle using a set-square.

Preparation

- Large size set-square (for Teacher's demonstration), set-squares for pupils, digital textbook software (if available).

Assessment

- Distinguish rectangles from various shapes with attention to right angles in the shapes. F
- Find rectangles based on the definition of a rectangle and its meaning. F



Teacher's Notes

Some Ways of Introducing "Rectangles and Squares"

1. By examining and categorising the shapes based on the properties and guide pupils to:

(i) Examine the number of vertices.
(ii) Examine the shape of the four corners.
(iii) Examine the length of the four sides.

2. Using the properties to recognise the differences and guide them to:

(i) Find the similarities and differences in the shapes.
(ii) A quadrilateral in which all 4 corners are right angles is called a rectangle.
(iii) A quadrilateral in which all 4 corners are right angles and the lengths of all 4 sides are the same is called square.

Lesson Flow

INTRODUCTION

1 Review.

T/P Review key ideas from previous lesson.

BODY

2 Introduce the Main Task.

T Introduce and explain the main task, "Let's find right angles in all 4 corners of a quadrilateral."

3 1 Find the triangles and quadrilaterals.

T Let the pupils identify the various quadrilaterals into those that have 4 corners and are right angles and those that are not right angles.

P Identify the quadrilaterals presented with attention to the number of right angles.

TN Teacher can advise pupils to count the number of right angles of each shape and write it down in a table. It can help pupils to easily realise that ⓒ and ⓔ are in the same group.

4 Definition of a rectangle.

T Let the pupils learn that a quadrilateral in which all 4 corners are right angles is called a rectangle.

P Read and understand the definition in [ ].

TN By showing an example of the shape of a rectangle, explain to the pupils that a quadrilateral in which all 4 angles are right angles is a rectangle.

5 2 Rectangles around us.

T Get the pupils to look for rectangles in their surroundings.

P Walk around the classroom and school building to look for things shaped like rectangles.

6 Exercise.

T Let the pupils do the Exercise.

P Select which shapes ⓐ-ⓓ are rectangles.

TN Some pupils may not recognise (d) as a rectangle as it is slanting.
Teacher advices them to examine each shape based on the definition, not how it is placed.

T/P Confirm the answers.

CONCLUSION

7 Summary.

T/P Summarise the lesson by confirming pupils' understanding of the main ideas of the lesson.

Sample Blackboard Plan

Date: **Chapter 14:** Triangles and quadrilaterals **Sub-Chapter 4:** Rectangles and Squares **Lesson Number:** 1/3

Main Task: Let's find right angles in all 4 corners of a quadrilateral.

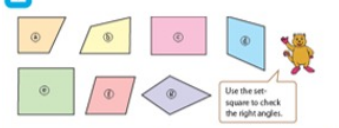
Review

- The set-square contains right angle
- Draw various right angles by connecting dots.

Activity

Quadrilaterals with right angles

1



0 Right-angles	1 Right-angle	2 Right-angles	4 Right-angles
d, f, g	b	a	c, e

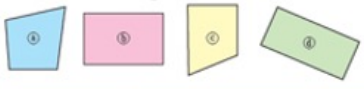
A quadrilateral in which all 4 corners are right angles is called **rectangle.**

2 **Rectangles around us**

- Textbooks
- Desk top
- Teachers Table
- Door
- Mobile Phone

Exercise

Which of these are rectangles ?



0 Right-angles	1 Right-angle	2 Right-angles	4 Right-angles
a		c	b, d

Summary

- A quadrilateral in which all 4 corners are right angles is called a rectangle.
- Rectangles around us include textbooks, desktops, teachers table, door, mobile phones.

Unit 14

Unit: Triangles and Quadrilaterals
Sub-unit: 4. Rectangles and Squares
Lesson 2 of 3

Textbook Page : p.181
Actual Lesson 135

Lesson Objectives

- To measure the lengths of the 4 sides of a rectangle and understand its properties.
- To draw rectangles using grid paper.

Prior Knowledge

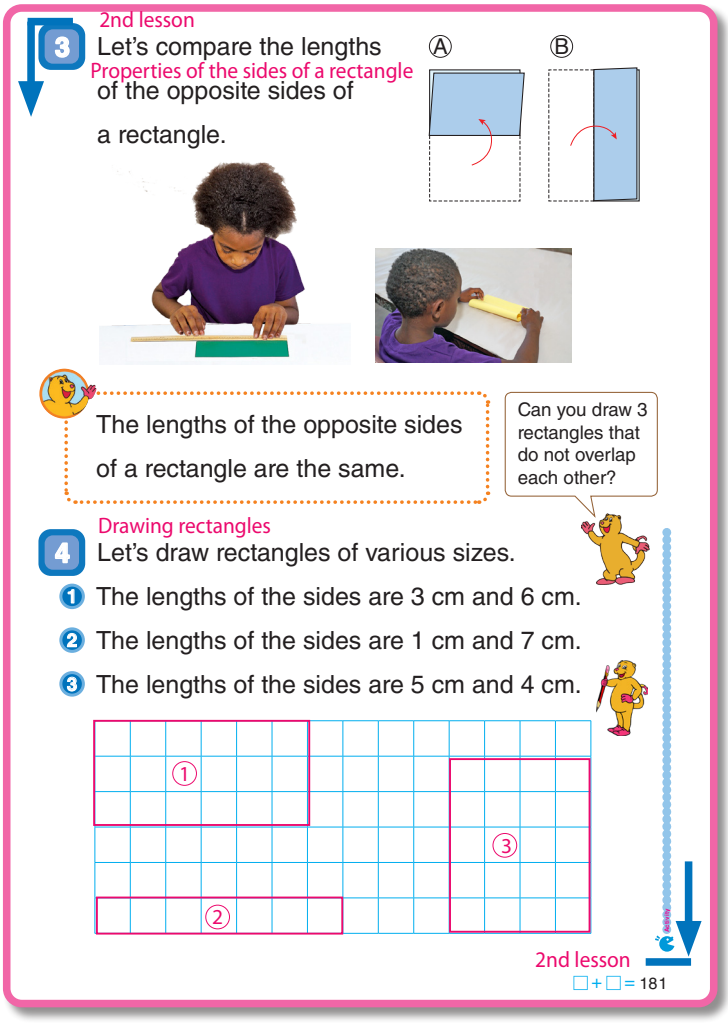
- Distinguishing rectangles from various shapes with attention to right angles in the shapes.
- Definition of a rectangle and its meaning.

Preparation

- Grid paper, string, ruler.

Assessment

- Measure the lengths of the 4 sides of a rectangle and understand its properties. F
- Draw rectangles using grid paper. F



Teacher's Notes

Drawing rectangles

Example;

Help the student to draw using grid paper.

1. Introduce the grid paper: showing the pupil the rows and columns and the size of each square.
2. Let them discuss the size of the rectangle they want to draw and offer guidance if they have difficulty to determine how many squares they should use for length and width.
3. Guide pupils to choose a starting point and count the number of squares needed for the length of rectangle.
4. Assist them in drawing the vertical sides of the rectangle by connecting marked points using straight lines.
5. Provide more grid papers for more practice.
6. Finally, do not forget to give them feedback and praise for their effort.

Lesson Flow

INTRODUCTION

1 Review.

T/P Review key ideas from previous lesson.

BODY

2 Introduce the Main Task.

T Introduce and explain the main task, "Let's examine the lengths of the sides of a rectangle."

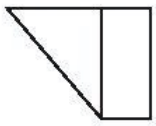
3 3 Compare lengths of a rectangle.

T Instruct the pupils to fold a rectangle-shaped paper as shown in the diagram in the textbook p.181.

P Fold a rectangle-shaped paper as shown in the pictures (A) and (B) on p.181 and compare the lengths of the sides.

TN Pupils may come up with the idea of measuring the lengths with a ruler to compare the lengths of the opposite sides. Teacher can have them realise an advantage of folding the paper and comparing the lengths as there is no error as in measurements with a ruler.

TN Teacher demonstrates to pupils, as shown on the picture below, that the lengths of the adjacent sides can be compared by folding the paper.



4 Lengths of opposite sides of a rectangle.

T Get the pupils to summarize that the lengths of the opposite sides of a rectangle are the same.

P Use the rectangle-shaped paper they used in the activity 3; they color each pair of the opposite sides in the same color and paste the rectangle paper on the notebooks.

5 4 Draw rectangles of various sizes.

T Get the pupils to draw rectangles 1-3 following the instructions.

P Following the rule that the lengths of the opposite sides of a rectangle are the same, pupils put four vertices on the grid paper, and draw rectangles by connecting them.

TN Teacher explains to pupils that a square on the grid paper is equivalent to 1 cm, and tells them to draw a line while bearing in mind that the length from the starting point is 1 cm every time they pass a square corner.

CONCLUSION

6 Summary.

T/P Summarise the lesson by confirming pupils' understanding of the main ideas in the lesson.

Sample Blackboard Plan

Date: **Chapter 14:** Triangles and quadrilaterals **Sub-Chapter 4:** Rectangles and Squares **Lesson Number:** 2/3

Main Task: Let's examine the lengths of the sides of a rectangle.

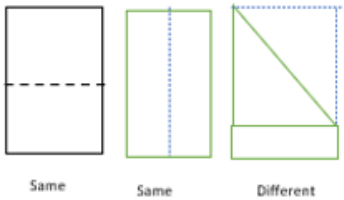
Review

- A quadrilateral in which all 4 corners are right angles is called a rectangle
- Rectangles around us include textbooks, desktops, teachers table top, door, mobile phone

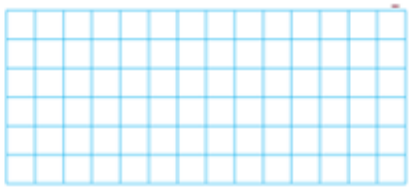
Activity

3 Comparing lengths of sides of rectangles

How to compare
- Put a string and compare the length of each side
- Fold a paper and compare the length of each side.



4 Draw rectangles of various sizes



Summary

- Findings
  - The length oft the opposite sides of a rectangle are the same.
  - Drawing rectangles on grid paper

Unit 14

Unit: Triangles and Quadrilaterals
Sub-unit: 4. Rectangles and Squares
Lesson 3 of 3

Textbook Page : p.182
Actual Lesson 136

Lesson Objectives

- To distinguish squares from various shapes with attention to the lengths of the four sides.
- To learn about the definition of square and its meaning.

Prior Knowledge

- Measuring the lengths of the 4 sides of a rectangle and understanding its properties.
- Drawing rectangles using a grid paper.

Preparation

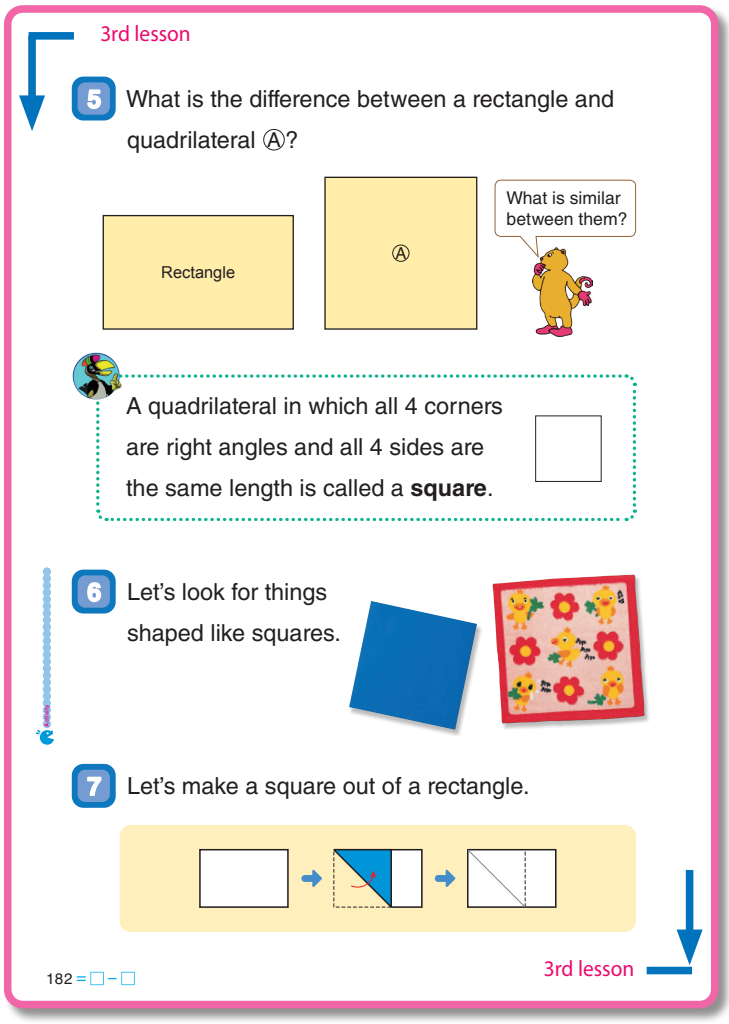
- Scissors, grid paper, set-square, ruler, rectangle-shaped and square-shaped paper

Assessment

- Distinguish squares from various shapes with attention to the lengths of the four sides. F
- Define what a square is and explain its meaning. F

Teacher's Notes

(1) Distinguishing squares.
(2) Difference: Ⓐ is different from a rectangle because the lengths of all 4 sides of Ⓐ are the same.
(3) Similarity: All 4 corners of both Ⓐ and a rectangle are right angles.
(4) Definition of a square.
(5) Finding squares.
(6) Making a square.



Lesson Flow

INTRODUCTION

1 Review.

T/P Review key ideas from previous lesson.

BODY

2 Introduce the Main task.

T Introduce and explain the main task, "Let's identify the differences between a rectangle and a quadrilateral Ⓐ".

3 5 Find the differences between the presented two quadrilaterals.

T Look at the two quadrilaterals shown in task 5. Find the similarities and differences between the rectangle and quadrilateral Ⓐ.

P Look at the two quadrilaterals and identify the differences and similarities.

TN Draw pupils' attention to the lengths of the sides and the size of the corner, and have them to discuss the differences they notice.

4 Definition of a square.

T Let the pupils learn that a quadrilateral in which all 4 corners are right angles and all 4 sides are the same length is called square.

P Read and learn the definition of a square in the [ ].

TN Introducing a square in comparison to a rectangle is expected to help pupils clearly understand the differences between them. In terms of the corners, both have 4 right angles. In terms of the sides, a square has all 4 sides with the same length.

Teacher can write a summary of these comparisons on the blackboard and have pupils copy it on their exercise books.

5 6 Look for things shaped like squares.

T Get pupils to look for squares in their surroundings.

P Look around the classroom or recall things they have at school that are square in shape.

6 7 Make a square out of a rectangle.

T Using a paper let the pupils make a square out from a rectangle without using a ruler. [Fold and compare]

P Try to make a square by utilising what they have learned about a square. [that is all 4 sides have the same length.]

CONCLUSION

7 Summary.

T/P Summarise the lesson by confirming pupils' understanding of the main ideas in the lesson.

Sample Blackboard Plan

Date: **Chapter 14:** Triangles and quadrilaterals **Sub-Chapter 4:** Rectangles and Squares **Lesson Number:** 3/3

Main Task: Let's identify the differences between a rectangle and a quadrilateral.

Review

- The length oft the opposite sides of a rectangle are the same.
- Drawing rectangles on grid paper

Activity

5

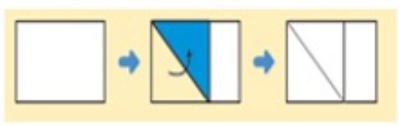
Rectangle Ⓐ

Similarities	Differences
• All 4 corners are right angles • The lengths of the opposite are the same • They have 4 sides	• The rectangle is a bit longer than the quadrilateral A • Quadrilateral A has all 4 sides the same

A quadrilateral in which all 4 corners are right angles and all 4 sides are the same length is called **square.**

6 **Things around us that are shaped like a square**
- Math Block
- A hanker chief
- Origami or colored paper

7 Making a square from a rectangle



Summary

- A quadrilateral in which all 4 corners are right angles and all 4 sides are same length is called a square.
- A square can be formed from rectangle.

Unit 14

Unit: Triangles and Quadrilaterals
Sub-unit: 5. Right Triangles
Lesson 1 of 2

Textbook Page : p.183
Actual Lesson 137

Sub-unit Objectives

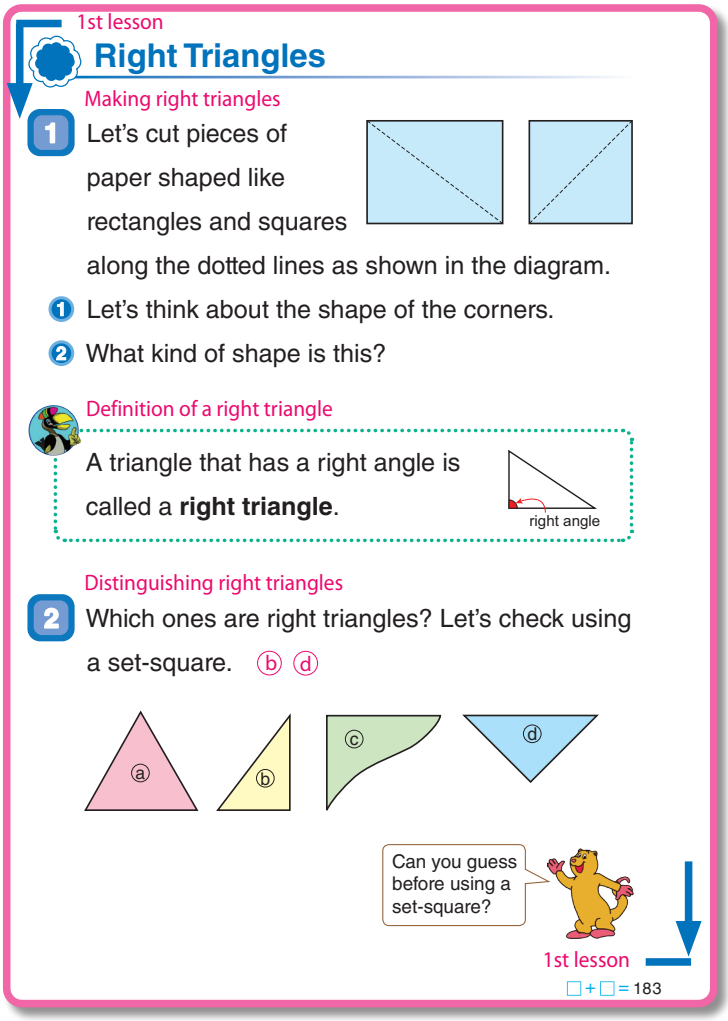
- To draw right triangles, rectangles and squares with attention to the elements composing each shape.
- To learn about the definition of square and its meaning.

Lesson Objectives

- To make a right triangle from a rectangle and a square.
- To learn about the definition of right triangle and its meaning.
- To distinguish right angles from various shapes with attention to the corner of a triangle and sides.
- To learn about the definition of square and its meaning.

Prior Knowledge

- Distinguishing squares from various shapes with attention to the lengths of the four sides.



- The definition of square and its meaning.

Preparation

- Rectangle-shaped and square-shaped paper, set-square.

Assessment

- Make a right triangle from a rectangle and a square. F
- Distinguish right angles from various shapes with attention to the corner of a triangle sides. F
- Define what a right triangle is and explain its meaning. F

Teacher's Notes

Triangle: "Definition" – a shape enclosed with three straight lines.
"Property" – composed of 3 vertices and 3 sides.
Quadrilateral: "Definition" – a shape enclosed with four straight lines.
"Property" – composed of 4 vertices and 4 sides.
Rectangle: "Definition" – a quadrilateral in which all 4 corners are right angles
"Property" – the opposing sides having the same lengths.
Square: "Definition" – a quadrilateral in which all 4 corners are right angles and all 4 sides are the same length.
In shape drawing activity in lessons, Teacher advises pupils to pay attention to the definition of the shape and use it in the drawing processes; however, in most of the cases, pupils would find it easier to draw the shape by following the property than following the definition. When drawing squares, rectangles or right triangles, for example, it is actually easier for us to determine the size and the shape of the figure if we place the vertices first. Therefore, "properties" are considered more practical and used more often than definitions in the elementary geometric figures.

Lesson Flow

INTRODUCTION

1 Review.

T/P Review key ideas from previous lesson.

BODY

2 Introduce the Main Task.

T Introduce and explain the main task, "Let's examine what shapes we get when we cut a rectangle and a square in half".

3 1 Cut a Rectangle and Square diagonally.

T Let the pupils cut a rectangle-shaped paper and a square-shaped paper into half along the diagonal (dotted) lines.

P Cut the rectangle-shaped paper and the square-shaped paper into half along the diagonal lines.

T 1 Ask pupils to carefully examine the shape of the corners.
"How many shapes have you got?" Pupils can also use a set square to test the corners.

P Examine the shape of the corners by using a set-square to test the corners.

T 2 Let pupils examine the shape and name of the new shape.

P Name the shape and use a set-square to check the corners.

T/P Identify some features of the triangles they made.

4 Definition of a right triangle.

T Let the pupils learn the definition of right triangle.

P Read and learn the definition of a right triangle.

TN By showing the picture of the right triangle, Teacher explains to pupils that a triangle that has a right-angle corner is called right triangle.
Teacher shows the sign to show a right angle in the triangle.

5 2 Select right triangles.

T Using the definition of right triangles, get the pupils to examine and identify which of the shapes ⓐ to ⓓ are right triangles.

P Identify which shapes ⓐ-ⓓ are right triangles.

T/P Place a set-square to each triangle and see whether it is a right triangle. If the shape is a right triangle, write/ indicate with the right triangle sign.

TN Some pupils may not recognise ⓓ as a rectangle as it is slanting.
Advice the pupils to examine each shape based on the definition, not how it is placed.

CONCLUSION

6 Summary.

T/P Summarise the lesson by confirming pupils' understanding of the main ideas in the lesson.

Sample Blackboard Plan

Date: **Chapter 14:** Triangles and quadrilaterals **Sub-Chapter 5:** Right Triangles **Lesson Number:** 1/2

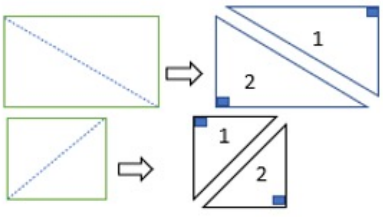
Main Task: Let's examine what shapes we get when we cut a rectangle and a square in half.

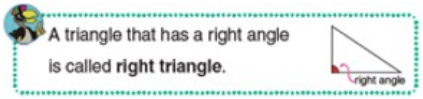
Review

- A quadrilateral in which all 4 corners are right angles and all 4 sides are the same in length is called a square.
- A square can be formed from a rectangle.

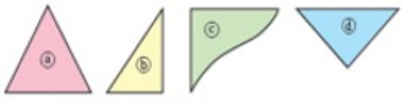
Activity

1 Cutting a Rectangle and a Square





2 Which shapes are right triangles?



A	B	C	D
X	✓	X	✓

Summary

- A triangle that has a right angle is called a right triangle
- When a rectangle is cut diagonally in half, 2 right triangles are formed
- When a square is cut diagonally in half, 2 right triangles are formed.

Unit 14

Unit: Triangles and Quadrilaterals
Sub-unit: 5. Right Triangles
Lesson 2 of 2

Textbook Page : p.184
Actual Lesson 138

Lesson Objectives

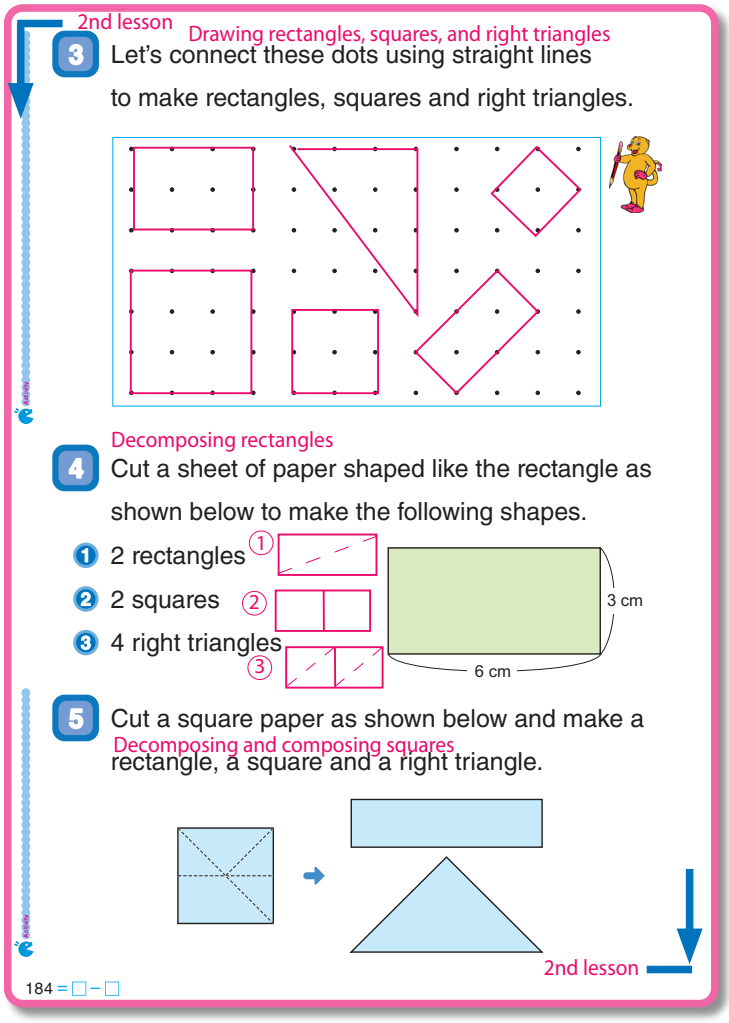
- To draw a rectangle, square and right triangle using a dot chart.
- To cut a rectangle and make a right triangle and a square.
- To cut a square into some parts, arrange each part and make a rectangle and right triangle.

Prior Knowledge

- Making a right triangle from a rectangle and a square.
- The definition of right triangle and its meaning.
- Distinguishing right angles from various shapes with attention to the corner of a triangle and sides.
- Definition of square and its meaning.

Preparation

- Rectangle-shaped and square-shaped paper, scissors, ruler.



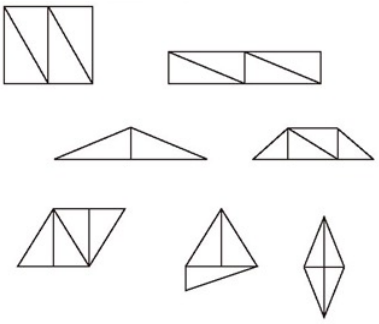
Assessment

- Draw rectangles, squares, and right triangles. F
- Arrange cut pieces of a square and rectangle to make triangles and quadrilaterals. F S

Teacher's Notes

Triangles and Quadrilaterals

By cutting and arranging a square-shaped paper as an advanced activity for 5, Teacher can have pupils cut the paper into 4 parts as shown below and tell them to make triangles and quadrilaterals in various shapes.



Note:

① is an activity to make a right triangle where pupils should be encouraged to think about which corner they want to keep as a right angle and have them try drawing various lines.

② is an activity to make a square with the side length of 3cm each.

③ is an activity to apply the results of ②.

For pupils who are having difficulty with this activity, Teacher can explain to the students to use the results of ① and ② as the tips.

Lesson Flow

INTRODUCTION

1 Review.

T/P Review key ideas from previous lesson.

BODY

2 Introduce the Main Task.

T Introduce and explain the main task, "Let's connect points to make rectangles, squares

and right triangles".

3 **③ Use straight lines to make rectangles, squares and right triangles.**

T Let the pupils connect the dots and draw various rectangles, squares, and right triangles.

P Connect the dots using a ruler to draw rectangles, squares, and right triangles in various shapes and sizes.

TN Teacher can prepare extra copies of dot sheets. When pupils finish drawing shapes, as an advanced activity, Teacher can provide another copy telling them to draw many rectangles, squares, and right triangles without a space and color them.

4 **④ Cut a rectangle shaped paper to make right triangles, rectangles and squares.**

T Let pupils fold and cut a rectangle-shaped paper to make four right triangles, two rectangles and two squares.

T/P Follow the instructions below on how to fold and cut the shapes described in ①-③.

How to fold and cut.

- Fold the opposite vertices of the paper to form 2-right triangles.
- Unfold the paper and fold the short-end part of the rectangular paper in half again.
- Open the paper again and 2 squares are formed.
- Fold the long-end of the rectangular paper in half and open the paper.
- Use a pencil to go over the folded areas.
- Use half of the folded rectangular paper and locate the 4-right angles.
- Cut off the four right triangles. Cut the other half of the rectangular paper in half and two rectangles are formed.

5 **⑤ Arrange a square-shaped paper to make a rectangle, square and right triangles.**

T Get pupils to put together the 5parts cut from the original square, and make a rectangle, a square, and a right triangle.

P Cut the square-shaped paper into 5 separate parts as shown in ⑤. Think about how they can put them together to make a rectangle, a square and a right triangle.

TN There may be pupils who may immediately start to arrange the parts while there may be also those who may take some time to imagine how to put the parts before arranging them. Teacher can tell them to think about the sizes of the corners as well as the lengths of the sides for them to explore further.

CONCLUSION

6 **Summary.**

T/P Summarise the lesson by confirming pupils' understanding of the main ideas in the lesson.

Sample Blackboard Plan

Date: **Chapter 14:** Triangles and quadrilaterals **Sub-Chapter 5:** Right Triangles **Lesson Number:** 2/2

Main Task: Let's connect points to make rectangles, squares and right triangles.

Review

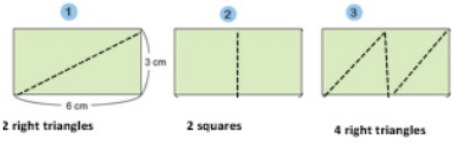
- A triangle that has a right angle is called a right triangle
- When a rectangle is cut diagonally in half, 2 right triangles are formed
- When a square is cut diagonally in half, 2 right triangles are formed.

Activity

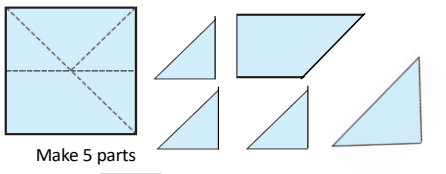
③ Making Rectangles, Squares and Right Triangles by connecting dots



④ Making Rectangles, Squares and Right Triangles from a rectangular paper



5



Summary

- Cut a rectangular paper to make 2 rectangles, 2 squares and 4 right triangles.
- Cut a square paper into 5 parts to make a rectangles, a square and a right-triangle.

Unit 14

Unit: Triangles and Quadrilaterals
Sub-unit: 6. Making Patterns
Lesson 1 of 1

Textbook Page : p.185
Actual Lesson 139

Sub-unit Objectives

- To draw and make rectangles, squares and right triangle.

Lesson Objectives

- To make rectangles, squares and right triangles using the dots.

Prior Knowledge

- Drawing a rectangles, squares and right triangles.
- Cutting a rectangle and making a right triangle and a square.
- Cutting a square into some parts, arranging each part and making a rectangle and right triangle.

Preparation

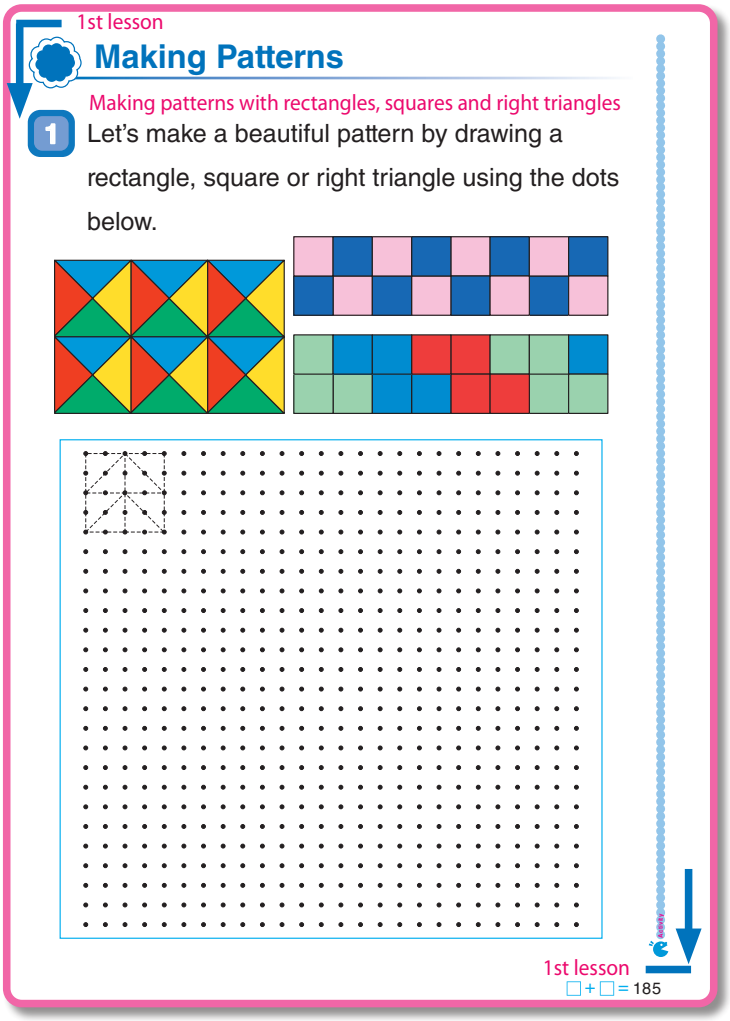
- Dotted sheet on p.185, set-square, ruler.

Assessment

- Make beautiful patterns with rectangles, squares and right triangles. F S

Teacher's Notes

Teaching a child to make beautiful patterns with rectangles, squares and right triangles can be a creative and enjoyable process. From Grade 1 the pupil made beautiful shapes by tracing them. In this lesson they will make patterns from the 3 shapes. Introduce them to the different patterns on p.185 of the textbook, let them recognise what a pattern is and how it repeats.
Ask them to begin with simple patterns, let them to choose colors they like and express them. Guide the pupil in step-by-step process as they move from one shape to another.



Lesson Flow

INTRODUCTION

1 Review.

T/P Review key ideas from previous lesson.

BODY

2 Introduce the Main Task.

T Introduce and explain the main task, "Let's make patterns with rectangles, squares and right triangles."

3 1 Make patterns with rectangles, squares and right triangles.

T Let the pupils look at 3 different patterns on p.185 and discuss what shapes are used.

P By observing the 3 patterns, pupils come to realise that the key for making a beautiful pattern is to use the same shape and place a number of them in order.

T Let the pupils choose the colors and the shape they will use from rectangles, squares and right triangles, and start drawing on the dot sheet.

P Choose which shape they will use from the 3 choices: rectangles, squares and right triangles and start drawing on the dot sheet on p.185 of the textbook.

TN Teacher checks pupils' work and advises pupils to put each shape together without a space and

T Get the pupils to draw each part of the same shape in order.

TN When walking around the classroom, Teacher can give individual support to pupils in regards to their choices of a shape, how they are drawing, and whether they are drawing the parts in order.

TN Teacher also advises them on their choices of colors.

CONCLUSION

4 Summary.

T/P Summarise the lesson by confirming pupils' understanding of the main ideas in the lesson.

Sample Blackboard Plan

Date: **Chapter 14:** Triangles and quadrilaterals **Sub-Chapter 6:** Making Patterns **Lesson Number:** 1/1

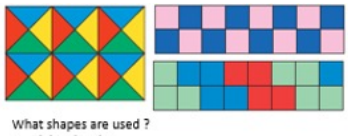
Main Task: Let's use the same shapes to make a beautiful patterns.

Review

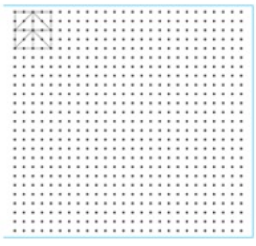
- Cut a rectangular paper to make 2 rectangles, 2 squares and 4 right triangles.
- Cut a square paper into 5 parts to make a rectangles, a square and a right-triangle.

Activity

1



What shapes are used ?
- Right triangle
- Rectangle
- Square



Summary

- Place each part to make it unique
  - By colors
  - By the number of colors used
  - Placing different colors
  - By the direction of each part
  - By the order

Unit 14 Unit: Triangles and Quadrilaterals

Exercise

Lesson 1 of 1

Textbook Page : p.186
Actual Lesson 140

Lesson Objectives

- To review and deepen the understanding of what has been learnt.

Prior Knowledge

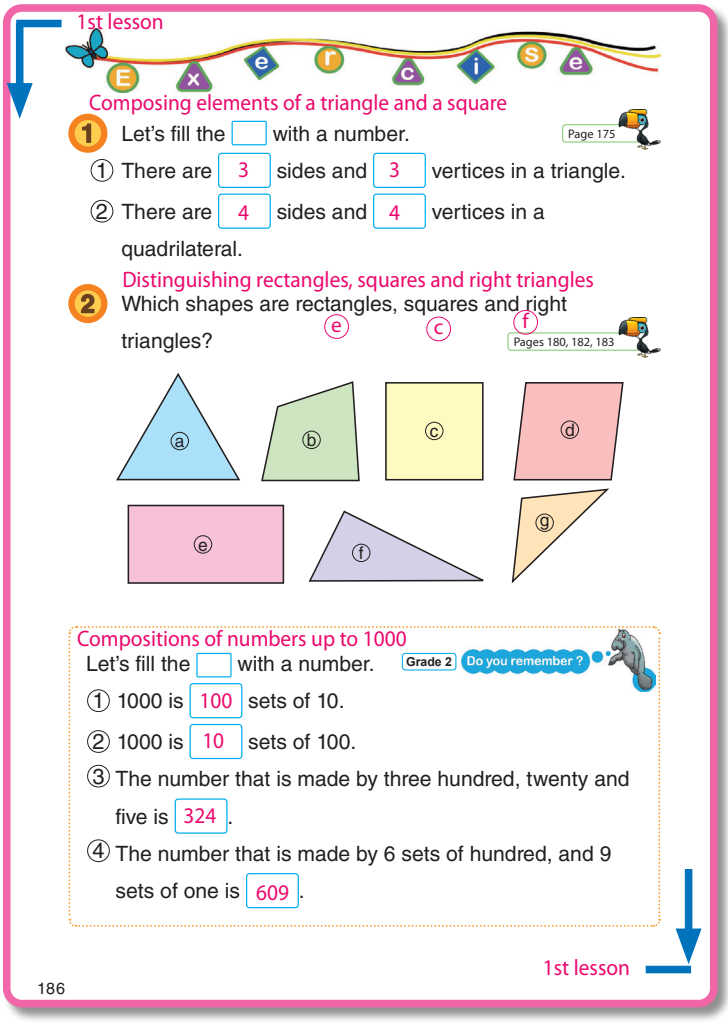
- To make rectangles, squares and right triangles using the dots.

Preparation

- Rectangle-shaped and square-shaped paper, scissors, ruler

Assessment

- Composing elements of a triangle and a square. F S
- Distinguishing rectangles, squares and right triangles. F S
- Compositions of numbers up to 1000. F S


1st lesson

Exercises

Composing elements of a triangle and a square

1 Let's fill the ☐ with a number. Page 175

① There are 3 sides and 3 vertices in a triangle.

② There are 4 sides and 4 vertices in a quadrilateral.

Distinguishing rectangles, squares and right triangles

2 Which shapes are rectangles, squares and right triangles? ⓔ ⓒ ⓕ Pages 180, 182, 183

ⓐ ⓑ ⓒ ⓓ ⓔ ⓕ ⓖ

Compositions of numbers up to 1000

Let's fill the ☐ with a number. Grade 2 Do you remember?

① 1000 is 100 sets of 10.

② 1000 is 10 sets of 100.

③ The number that is made by three hundred, twenty and five is 324.

④ The number that is made by 6 sets of hundred, and 9 sets of one is 609.

1st lesson

186

Teacher's Notes

Distinguishing rectangles, squares and right triangles

While pupils may start to use a ruler to measure the lengths, Teacher should advise them to first make an estimate. There may be some pupils who try to use a set-square to double check whether a corner is a right angle or not. Teacher should acknowledge such effort and make positive comments to their carefulness.

Definitions of rectangle, square and right triangle.

With the definitions of rectangles, some pupils may think it is not only for a rectangle but also for a square. They are actually correct as the definition of rectangle is "a quadrilateral in which all 4 corners are right angles" and it can be also applied to describing a square. Teacher should positively acknowledge this point: however, at this stage, teacher explains to them that based on the definition they have learnt, a rectangle is the only correct answer here.

Identifying the shapes.

To make it easy to find squares and avoid overlaps and overlooking, Teacher can introduce three ways to look at squares according to their sizes: a small square (having a side with the length of 1 square), a medium size square (having a side with the length of 2 squares), and a large square (having a side with the length of 3 squares). Teacher can compile the results on the blackboard as below.

Small square	9
Medium size square	4
Large square	1
Total	14

Relate these notes to Problems 1 and 2.

Lesson Flow

EXERCISE

1 Fill in the boxes with a number.

P Review the elements composing triangles and quadrilaterals.

TN Teacher reinforce with pupils the elements composing geometric figures and reviews the terms “sides” and “vertices”.

2 Distinguish which shapes ⓐ to ⓖ are rectangles, squares and right triangles.

P Find rectangles, squares and right triangles from the various shapes presented in activity ②.

TN When checking answers, Teacher should encourage pupils to not only tell their answer but explain the reasons based on the definitions; ⓔ is a rectangle because there are 4 right angles in it; ⓒ is a square because there are 4 right angles and all 4 sides are the same length; ⓕ is a right triangle because it is a triangle with a right angle in it, and so on.

Review of numbers up to 1000 in unit 1 of grade 2.

P Fill in the boxes with numbers.

TN Reinforce on the compositions of numbers up to 1000.

Sample Blackboard Plan

Date: **Chapter 14:** Triangles and quadrilaterals **Sub-Chapter**: Exercise **Lesson Number:** 1/1

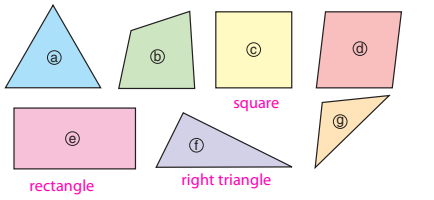
Exercise

1 Let’s fill the ☐ with a number. Page 175

① There are 3 sides and 3 vertices in a triangle.

② There are 4 sides and 4 vertices in a quadrilateral.

2 Which shapes are rectangles, squares and right triangles? Pages 180, 182, 183



Let’s fill the ☐ with a number. Grade 2 Do you remember ?

① 1000 is 100 sets of 10.

② 1000 is 10 sets of 100.

③ The number that is made by three hundred, twenty and five is 324.

④ The number that is made by 6 sets of hundred, and 9 sets of one is 609.

Unit 14

Unit: Triangles and Quadrilaterals
Problems 1 and 2
Lesson 1 of 1

Textbook Page : p.187~188
Actual Lesson 141

Lesson Objectives

- To review what has been learnt.
- To think about the points of classification and distinction for various objects.

Prior Knowledge

- All content in this chapter

Preparation

- Enlarged pictures of the shapes (a)-(f) for posting, set-square, ruler

Assessment

- Solve the evaluation problems correctly and confidently. F S
- Enjoy solving the problems to confirm the understanding of what has been learnt. F S

Lesson Flow

PROBLEMS 1

1 Distinguishing rectangles, squares and right triangles

P Distinguish rectangles, squares and right triangles in the various shapes that are placed in various directions.

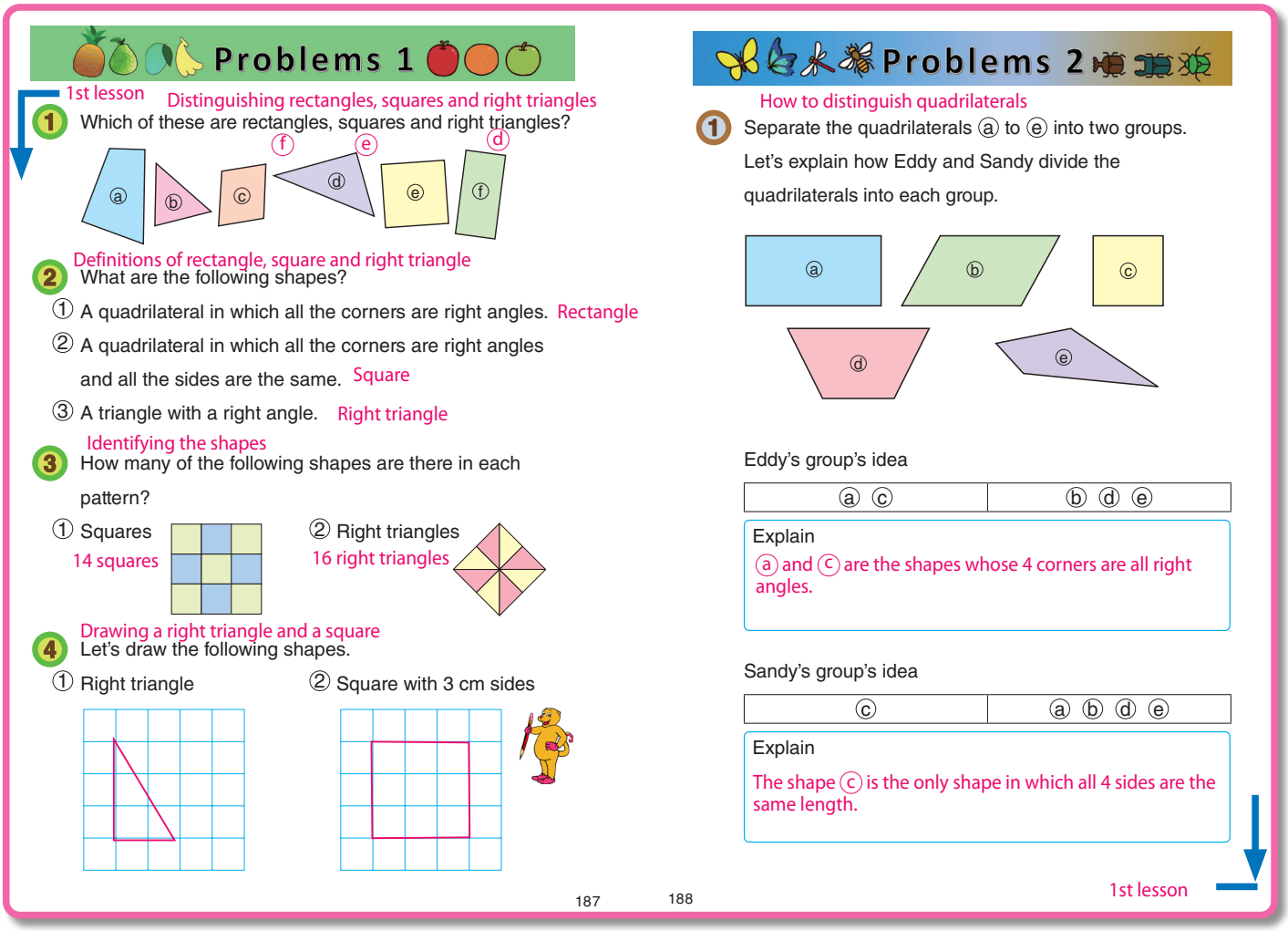
2 Definitions of rectangle, square and right triangle.

P Distinguish the shapes according to the presented definitions.

3 Identifying the shapes.

P Identify squares and right triangles in the presented shapes.

TN Prior to the activity, explain to pupils that there are squares and right triangles in various sizes and that they have to find all of them regardless of the sizes.



Problems 1

1st lesson

Distinguishing rectangles, squares and right triangles

1 Which of these are rectangles, squares and right triangles?

ⓐ ⓑ ⓒ ⓓ ⓔ ⓕ

Definitions of rectangle, square and right triangle

2 What are the following shapes?

① A quadrilateral in which all the corners are right angles. Rectangle

② A quadrilateral in which all the corners are right angles and all the sides are the same. Square

③ A triangle with a right angle. Right triangle

Identifying the shapes

3 How many of the following shapes are there in each pattern?

① Squares 14 squares

② Right triangles 16 right triangles

Drawing a right triangle and a square

4 Let's draw the following shapes.

① Right triangle

② Square with 3 cm sides

187

Problems 2

How to distinguish quadrilaterals

1 Separate the quadrilaterals ⓐ to ⓔ into two groups. Let's explain how Eddy and Sandy divide the quadrilaterals into each group.

ⓐ ⓑ ⓒ ⓓ ⓔ

Eddy's group's idea

ⓐ ⓒ	ⓑ ⓓ ⓔ

Explain

ⓐ and ⓒ are the shapes whose 4 corners are all right angles.

Sandy's group's idea

ⓒ	ⓐ ⓑ ⓓ ⓔ

Explain

The shape ⓒ is the only shape in which all 4 sides are the same length.

1st lesson

188

Lesson Flow

④ Drawing a right triangle and a square.

P Draw a right triangle and a square on the dot sheet.

TN ① For drawing a right triangle, advise pupils to first decide where to put a right angle on the dot sheet.
Squares on the dot sheet all have right angles, so pupils can make use of it.
If pupils try to draw a right triangle without making use of the corners of the squares, Acknowledge and positively comment on their ideas as long as they are correct.

TN ② Is an activity to draw a square of the specified lengths. This is easy if pupils can find out one square on the dot sheet is 1 cm long.
In line with the definition of a square, pupils should be able to tell that the corners of the squares on the dot sheet are all right angles and that all 4 sides of this square should have 3 cm (thus, 3 squares each side).

PROBLEMS 2

① Categorise the quadrilaterals ⓐ-ⓔ.

P Look at the textbook and think how Eddy and Sandy have categorised the shapes.

TN Teacher has pupils compare the shapes by looking at their features such as the lengths of the sides and the sizes of the corners.

② Explaining how Eddy and Sandy have categorised the shapes.

T Please explain how Eddy and Sandy have categorised the shapes.
Eddy's idea: ⓐ Rectangle and ⓒ Square are in the same group.
Other quadrilaterals ⓑ ⓓ and ⓔ are the different group.
ⓐ and ⓒ are the shapes whose 4 corners are all right angles.
Sandy's idea: The shape ⓒ, that is a square, should be distinguished from other shapes.
The shape ⓒ is the only shape in which all 4 sides are the same length.

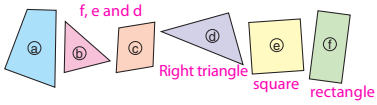
TN Teacher has pupils explain with attention to the composing elements of the shapes.

Sample Blackboard Plan

Date: **Chapter 14:** Triangles and quadrilaterals **Sub-Chapter:** Problems **Lesson Number:** 1/1

Problems 1

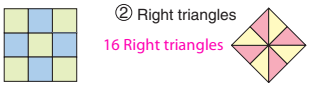
① Which of these are rectangles, squares and right triangles?



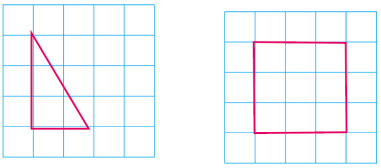
f, e and d
Right triangle
square
rectangle

② What are the following shapes?
① A quadrilateral in which all the corners are right angles. Rectangle
② A quadrilateral in which all the corners are right angles and all the sides are the same. Square
③ A triangle with a right angle. Right triangle

③ How many of the following shapes are there in each pattern?
① Squares 14 squares
② Right triangles 16 Right triangles

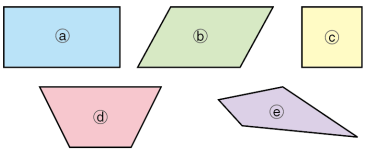


④ Let's draw the following shapes.
① Right triangle ② Square with 3 cm sides



Problems 2

① Separate the quadrilaterals ⓐ to ⓔ into two groups. Let's explain how Eddy and Sandy divide the quadrilaterals into each group.



Eddy's group's idea

ⓐ ⓒ	ⓑ ⓓ ⓔ

Explain
ⓐ and ⓒ are the shapes whose 4 corners are all right angles.

Sandy's group's idea

ⓒ	ⓐ ⓑ ⓓ ⓔ

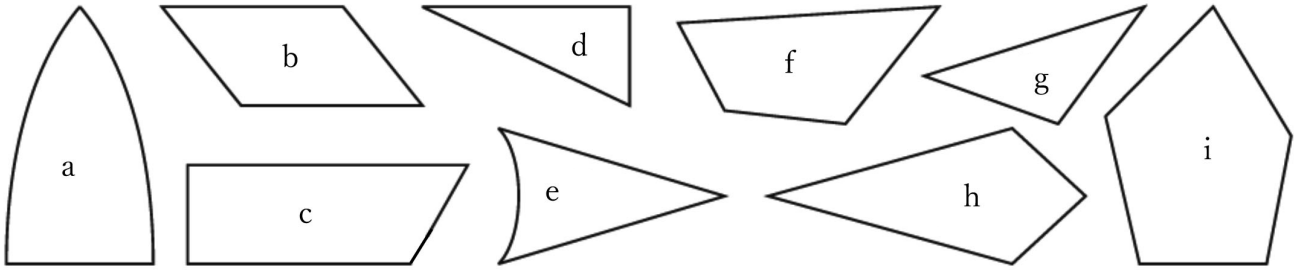
Explain
The shape ⓒ is the only shape in which all 4 sides are the same length.

End of Chapter Test: Chapter 14 **Date:**

Evaluation: **Chapter 14** Triangles and Quadrilaterals	Name:	Score /100

1. Classify them into triangles, quadrilaterals, and others. [10 points for each]

Triangles_____ Quadrilaterals _____ Others _____



2. For the triangles and quadrilaterals below, circle the place of right angles. [5 points for each]



3. Connect the dots to draw rectangles, squares, and right triangles. [20 points for each]



Chapter 15 Large Numbers

1. Unit Objectives

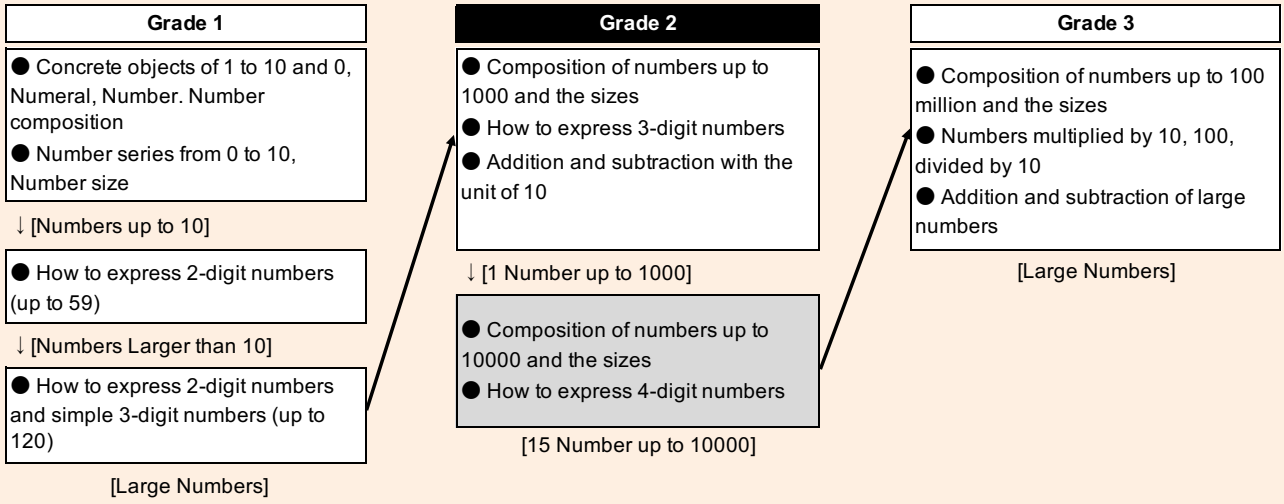
- To understand the meaning and the representations of numbers, and extend their ability to use numbers.
- To understand the composition of numbers up to 10000, how to read and write the numbers, and the meaning of a thousand.
- To understand the sizes and orders of numbers up to 4 digit numbers.
- To understand relative sizes of numbers by using 100 or 1000 as a unit.

2. Teaching Overview

In this unit, based on understanding numbers and calculations up to 3-digit numbers, pupils will expand the range of numbers to 4-digit numbers and learn about the composition, reading, writing, order, sequence, and comparison of size.
“Numbers up to 1000”.
pupils will make 10000 in units of 1000 in the same way using the learning experience of making 1000 in units of 100 in the unit.

Key Concepts: Composition of numbers up to 10,000 and expressing 4-digit numbers.

3. Related Learning Contents



Unit 15

Unit: Large Numbers
Sub-unit: 1. Numbers up to 10000
Lesson 1 of 6

Textbook Page : p.189
Actual Lesson 142

Sub-unit Objectives

- To count the number of concrete objects by utilising what pupils have learnt in the previous lessons.
- Devising (creatingys of counting.

Lesson Objectives

- To count the number of concrete objects by utilising what pupils have learnt in the previous lessons.
- Devising (creating) ways of counting.

Prior Knowledge

- Grade 1, Unit 15 Large Numbers-Numbers up to 1000.

Preparation

- 2 kg of rice grains and a plate with rice grains on it.



Assessment

- To create ways of counting up to 1000. F

Teacher's Notes

This lesson is an introductory lesson to Large Numbers up to 10 000.
Pupils will discover that it is difficult to count rice grains one by one simply because there are too many grains of rice and that it would be time consuming. This is definitely not a better way to count. From this experience, pupils should find the necessity of coming up with an easier way to count.

1. Devising ways of counting Large Numbers of rice grains.

1. For the rice grains it would be better to estimate a hand full of rice grains to be 100 grains of rice and put in groups. Then work out how many sets of 100 grains of rice would make 1000 and further thinking about how many sets of 1000 would they possibly make from the rice grains and so on.
   Here pupils tend to see how numbers are very large through this situation.

Lesson Flow

INTRODUCTION

1 Review.

T/P Review key ideas learnt in the previous grade.

T/P Review Numbers up to 1000

BODY

2 Introduce Main Task.

T Introduce and explain the main task 'Let's count the number of rice grains and find easier ways to count'.

3 Let's count the number of grains of rice on a plate.

T Let the pupils open to page 189 of the textbook and ask questions relating to the picture.

- Are you able to count the number of rice grains?

Lesson Flow

- Are you able to count the number of rice grains on the plate?

P I cannot count the rice grains easily. It's plenty.

TN Make the pupils feel that counting one by one is time-consuming and would not be the best way. From this experience, pupils should find the necessity of coming up (devising) with an easier way to count the number of grains.

T Get the pupils to start thinking of how they can count more effectively

P Devise easier ways to count the number of grains.

TN Put the pupils into groups and have each group guess the approximate number of rice grains.

TN Allow each group to guess the approximate number of rice grains.

4 Count the number of rice grains in groups of 100 rice grains.

T Let the pupils count the number of rice grains in groups of 100 with a given time.

P Count the number of rice grains in groups of 100 within a given time.

TN Observe the pupils understanding on how they can count quickly and more efficiently. Take note of groups that completed the counting of concrete objects.

TN Find that some pupils may scoop a handful of rice grains and estimate it to be 100 grains and place each handful in groups.

From there they may be able to find groups or sets of 100 grains of rice are there:

T Have the group who finished before the given time to explain their method of counting.

P In groups, explain their own counting method.

TN Take note of the ideas given by the groups and appreciate their ideas.

P Pupils can further find how many groups or sets of 100 grains of rice amounts to 1000 grains of rice.

TN Allow each group to guess the approximate number of rice grains.

5 Count the actual number in groups and present the results.

TN While each group comes up with different numbers, the emphasis should be placed not on the number that each team presents but on how they counted the number.

T Have each group count the actual number in groups and present the results.

P Count the actual number in groups and present the results.

CONCLUSION

6 Summary.

T/P Summarise the lesson by confirming pupils' understanding of the main ideas in the lesson.

Due to space limitations, the Teacher's Notes is placed on page 322.

Sample Blackboard Plan

Date: **Chapter 15:** Large Numbers **Sub-Chapter 1:** Numbers up to 10000 **Lesson Number**: 1/6

Main Task: 'Let's count the number of rice grains and find easier ways to count.'

Review

① Review numbers up to 1000.
The sum of 10 sets of 100 is called _____ and written as _____.

Activity

① How many rice grains are there on the plate?



Do you remember how to count numbers up to 1000?



	Guess the number of rice grains	Result of the number of rice grains
Group 1		
Group 2		
Group 3		

② Let's think about easier ways to count the rice grains.

a. How many sets of 100 rice grains are there?

Count the number of rice grains in groups/sets of 100.

b. How many sets of 1000 rice grains are there?

Count the number of rice grains in groups/sets of 1000.

Summary

- To count large numbers of rice grains, it is easier to estimate a handful of rice to be 100 and put in groups to see how many sets make 1000 and further discover how sets of 1000 are there.

Unit 15

Unit: Large Numbers
Sub-unit: 1. Numbers up to 10000
Lesson 2 of 6

Textbook Page : p.190~191
Actual Lesson 143

Lesson Objectives

- To recognise the number “two thousand”.
- To understand how to read and write 4-digit numbers.

Prior Knowledge

- To group objects and animals in the pictures.
- To describe locations of objects by using words such as “above” “under/below” “on the right” “on the left”.

Preparation

- Enlarged picture from the textbook p.190, rulers, digital textbook software (if available)

Assessment

- Recognise the number “two thousand. F
- Understand how to read and write 4-digit numbers. F

Teacher’s Notes

Teaching tips

When reading the numbers ‘2346’ in this lesson, pupils may answer “23 hundred and forty-six”. Pupils should recall the rule they learned that when 10 sets of something such as 10 ones and 10 tens are formed, it can be carried to the next place. In this way, pupils should be able to tell that 23 hundred is not correct. Here, Teacher can explain that “10 sets of 100 (10 hundreds) is called a thousand (1000)” and that the thousands place is the place above the hundreds place.

The thousands place then can be added to the place value chart, which should look like as below.

Thousands place	Hundreds place	Tens place	Ones place
2	3	4	6

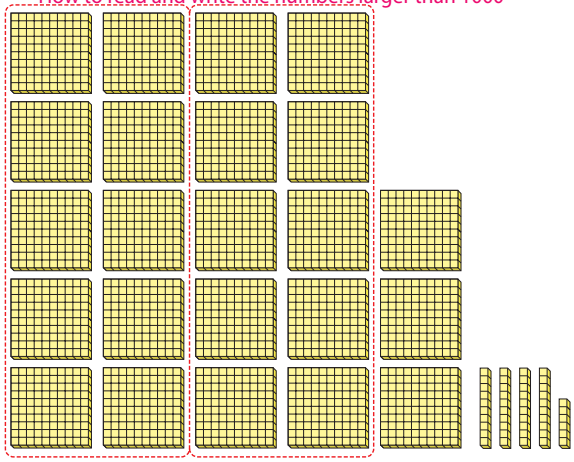
2nd lesson

1 How many ▱ are there as shown below?

1 How many sets of 100 are there? 23 sets

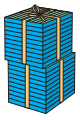
2 How many sets of 1000 can they make? 2 sets

Composition of numbers larger than 1000, How to read and write the numbers larger than 1000



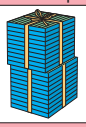


When there are 2 sets of 1000, we call it **two thousand**.



3 What can you say about the total number of grains of rice?

The position where 2 is in 2346, is called the **thousands place**.

Thousands place	Hundreds place	Tens place	Ones place
			
two thousand	three hundred	forty	six
2	3	4	6

The number that is made from the sum of two thousand, three hundred, forty and six is called **two thousand three hundred and forty-six**.

And it is written as **2346**.

2nd lesson

2 How many sheets of paper are there?

1 

2 3 sets of 1 thousand and 9 sets of 1 hundred.

3 5 sets of 1 thousand and 7 sets of ten.

	Thousands place	Hundreds place	Tens place	Ones place
1				
2				
3				

190 = □ − □

□ + □ = 191

Lesson Flow

INTRODUCTION

1 Review.

T/P Review key ideas learnt in the previous lesson.

P Review on how they came up with a easier way to count large numbers of rice grains.

BODY

2 Introduce Main Task.

T Introduce and explain the main task: 'Let's count the number of blocks and find easier ways to count.'

3 ① Count to find how many single blocks of 1s are shown.

T/P ① Let's find how many sets of 100 are there.

P Look at the picture on p.190 where two children are counting the number of blocks and think about the differences in how they are counting.

TN Have the pupils to present what differences they notice in the ways of counting the number of blocks done by the two pupils. Girl --- Counting one by one Boy --- Making sets of 10 and counting by sets Teacher can have pupils gradually realize that counting one by one is not easy and that counting by making sets of 10 is better.

T ② How many sets of 1000 can they make?

P Count the number of blocks shown in the picture on p.190.

TN Teacher has pupils realise that the blocks are already grouped into sets of 100 blocks, 10 blocks and separate pieces.

P Count the number of blocks accordingly as follows; Sets of 100 --- 23 sets Sets of 10 --- 4 sets Separate pieces --- 6

P Count the number of blocks accordingly in sets representation of the blocks.

TN Teacher checks with pupils that 10 sets of 100 is 1000.
Teacher then has pupils understand that, when there 23 sets of 100, it is the same as 2 sets of 1000 and 3 sets of 100.

T Let the pupils realise and understand that, 'when there are 2 sets of 1000 it is called 'two thousand' (and written as 2000)'.

4 ③ Identify the number of all the blocks and understand how it is represented.

T/P Let's discuss about what we can say about the total number of rice grains.

P Identify the number of all the blocks and understand how to represent it.

TN Teacher makes sure pupils understand that there are 2 sets of 1000, 3 sets of 100, 4 sets of 10 and 6 singles before introducing the term "thousands place."

T Teacher introduces the term "the thousands place."

P Understand that the total number of blocks can be written as 2346 which is called "two thousand three hundred and forty-six."

P The position where 2 is in the number 2346 is called by the term "the thousands place."

CONCLUSION

5 Summary.

T/P Summarise the lesson by confirming pupils' understanding of the main ideas in the lesson.

Sample Blackboard Plan

Date: **Chapter 15:** Large Numbers **Sub-Chapter 1:** Numbers up to 10000 **Lesson Number:** 2/6

Main Task: 'Let's count the number of blocks and find easier ways to count.'

Review

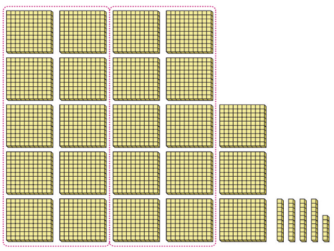
① Review easier ways to count large number of rice grains. It is easier to count rice grains in sets of _____ and _____.

Activity

1 How many blocks of 1s are there altogether?



1 How many sets of 100 blocks are there?_____



2 How many sets of 1000 blocks did they make? _____

When there are 2 sets of 1000, we call it **'two thousand.'**

3 What is the total number of rice grains?

Thousands place	Hundreds place	Tens place	Ones place
			
two thousand	three hundred	forty	six
2	3	4	6

The number that is made from the sum of (two thousand), (three hundred), (fourty) and (six) is called **'two thousand three hundred and fourty-six.'** And it is written as **2346**

Summary

- The position where 2 is in 2346 is called the **'thousands place.'**

Sets of 1000	Sets of 100	Sets of 10	Separate pieces
2	3	4	6

Unit 15

Unit: Large Numbers
Sub-unit: 1. Numbers up to 10000
Lesson 3 of 6

Textbook Page : p.191
Actual Lesson 144

Lesson Objectives

- To understand how to read and write 4-digit numbers with a 0 value in a place value chart.

Prior Knowledge

- Thousands place.

Preparation

- Sets of paper sets of 1000 sheets, 100 sheets, 10 sheets and separate sheets of paper, place value chart, digital textbook software (if available)

Assessment

- Understand how to read and write 4-digit numbers with a 0 value in a place value and write them.

F S

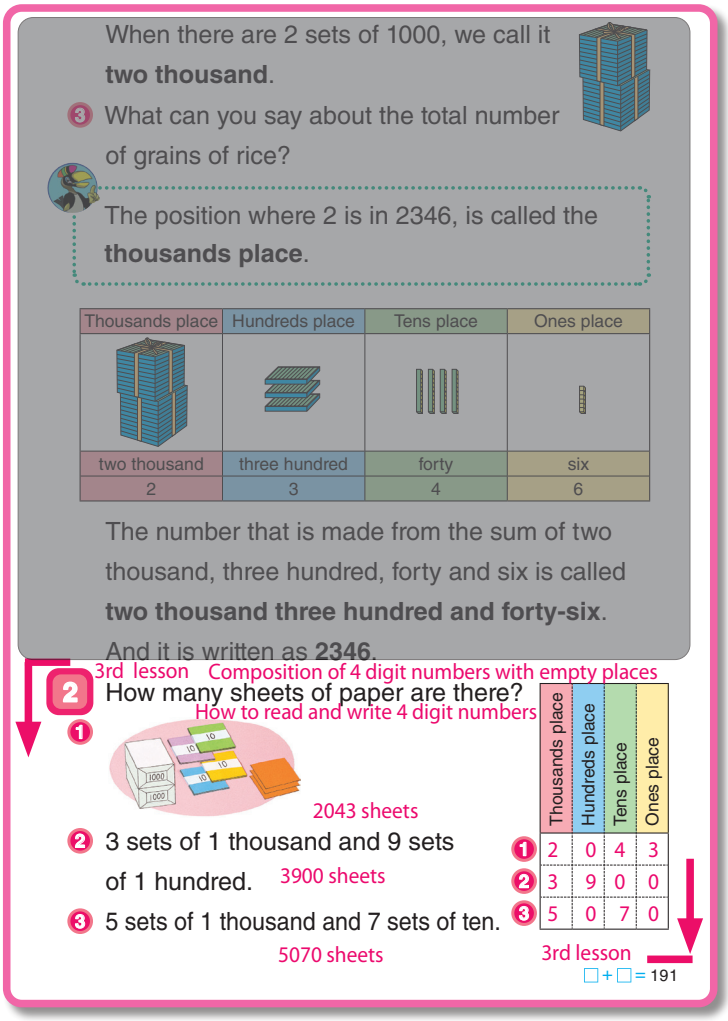
Teacher's Notes

Teaching tips

Composition of 4 digit numbers with empty places.

How to read and write 4 digit numbers

- two thousand and forty-three sheets
  2043 sheets.
- three thousand nine hundred sheets
  3900 sheets.
- five thousand and seventy sheets
  5070 sheets



p.318 Teacher's Notes

2. Devising ways of counting Large numbers of single blocks of 1s.

For the single blocks of 1s, it helps pupils to clearly see the structure of numbers especially the composition of numbers larger than 1000 and how to read and write them.

The blocks of 1s is used as a unit to create blocks of 10s, 100s and 1000s.

From there, pupils will discover how many sets of 100 can make 1000 and also further their thinking to discover how many sets of 1000 can make 10000. When there are 2 sets of 1000, we call it 2 thousand,

The position where 2 is in the number 2346 is called the 'thousands place'. The number 2346 can be written as "two thousand three hundred and forty-six".

Lesson Flow

INTRODUCTION

1 Review.

T/P Review key ideas learnt in the previous lesson.

BODY

2 Introduce Main Task.

T Introduce and explain the main task, 'Let's find how many sheets of paper are there altogether.'

3 ② Write 4-digit number that does not have any value in the hundreds place.

T/P ①Read and understand the task and discuss.

T Ask, 'How many sheets of paper are there?'

P Look at the picture and tell how many sets of 1000, 10 and 1 there are and realise that there is no set of 100 in this number.

T How can we write this number using the place value chart?

T/P Let's understand how write numbers in numerals when they do not have any value in the hundreds place using the place value chart.

P Write down the 4-digit numbers that does not have any value in the hundreds place.

4 ② Think about the structure and how to write and read numbers up to thousands place.

P ②-③ Study the structure of the place value chart and fill the chart with numbers for each place value starting from the ones place value accordingly and see how the chart will look like.

T Explain to pupils based on the idea of 'place values.'

P Complete activities from 2 to 3 on the place value chart.

TN Ensure pupils place the numbers correctly.

5 Do a practice to confirm learning.

T Let the pupils practice describing 4-digit numbers with empty places in the same way that they did in activity ①.

TN Have the pupils carefully consider which place value is absent: 100, 10 or 1 and revise the learning in the previous units where they put 0 to indicate the absent value in the place.

T Ask the pupils to find any 4-digit number situations that has no sets of hundreds, tens and ones and write the numbers using a place value table.

P This year is 2011.

P Ila bought a washing machine for 2705 kina.

P My big brother's school fee was 3950 kina

CONCLUSION

6 Summary.

T/P Summarise the lesson by confirming pupils' understanding of the main ideas in the lesson.

Sample Blackboard Plan

Date: **Chapter 15:** Large Numbers **Sub-Chapter 1:** Numbers up to 10000 **Lesson Number**: 3/6

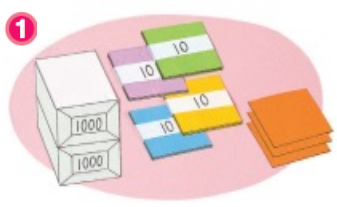
Main Task: 'Let's find how many sheets of paper are there altogether.'

Review

① Review easier ways to count large number of blocks of 1s and find easier ways to group blocks in sets of _____, _____, ____ and ___.

Activity

② How many sheets of paper are there altogether?



① Write down the number using the place value chart.

	Thousands place	Hundreds place	Tens place	Ones place
①	2	0	4	3

② Fill the place value chart with numbers for each place value.

② 3 sets of 1 thousand and 9 sets of 1 hundred.

③ 5 sets of 1 thousand and 7 sets of ten.

	Thousands place	Hundreds place	Tens place	Ones place
②	3	9	0	0
③	5	0	7	0

Summary

- When filling in the place value chart, carefully consider which place value is absent: 100, 10 or 1.

Unit 15

Unit: Large Numbers
Sub-unit: 1. Numbers up to 10000
Lesson 4 of 6

Textbook Page : p.192
Actual Lesson 145

Lesson Objectives

- To understand the relative sizes of numbers.
- To read and write numbers.
- To understand the compositions of numbers.

Prior Knowledge

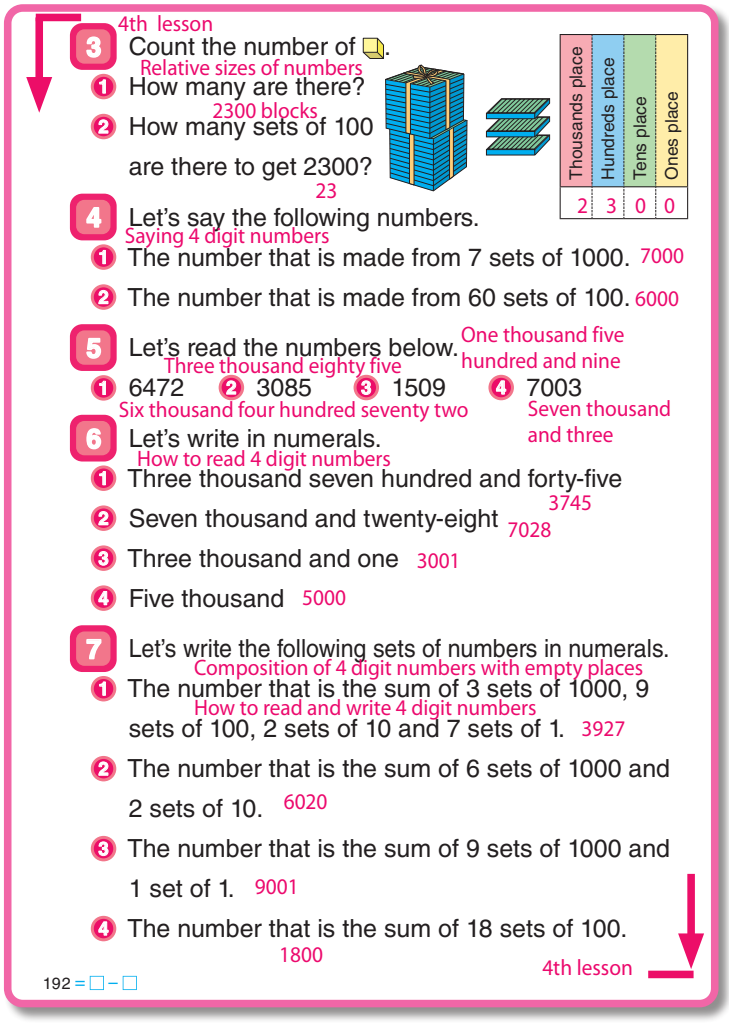
- Composition of 4-digit numbers with empty places.
- How to read and write 4-digit numbers.

Preparation

- blocks of 1000, 100, 10 and ones, place value chart, number flashcards.

Assessment

- To understand the compositions of 4-digit numbers. F
- To understand the relative sizes of 4-digit numbers. F
- To read and write 4-digit numbers. F



Teacher's Notes

Make and use a place value chart to operate place values up to one thousand place.

The use of a place value chart helps deepen an understanding of how to read large numbers. It is easier to read and understand the structure of numbers after separating digits for ones, tens, hundreds and thousands place etc...

However, some pupils might find difficulties in reading and writing large numbers with empty places (zero in the place values).

As for these pupils, have them write large numbers on a place value chart to operate place values and read them. In doing so, it is important for them to focus on empty places of 0. Also, it is good to understand that a way of expressing is a base ten system.

Therefore, it is good to make full use of a place value chart to operate place values. It is also beneficial to have pupils to think about numbers up to 4-digits numbers freely by writing them on the chart to operate place values and read them.

Lesson Flow

INTRODUCTION

1 Review.

T/P Review key ideas learnt in the previous lesson.

BODY

2 Introduce the Main Task.

T Introduce and explain the main task, 'Let's count, read and write numbers up to thousands place.'

3 3 Identify the number of mathematics blocks in the picture.

T 1 Let the pupils identify the number of mathematics blocks in the picture.

Lesson Flow

TN Teacher checks whether pupils have written the numbers in the right places.
Thousands place --- 2
Hundreds place --- 3
Tens place --- 0
Ones place --- 0

4 ② Think about how many sets of 100 makes 2300.

T/P Read and understand the question.
P Think about how many sets of 100 makes 2300.
T Guide pupils to think step by step as they are given; 10 sets of 100 is 1000, therefore, 2000 can be thought of as 20 sets of 100. In this line, 2300 can be thought of as 23 sets of 100.
T Answer questions ① and ②.

5 ④ Think about the structure and how to read numbers up to 'thousands place'.

T Explain to pupils based on the idea of place values.
P Confirm how to read 4-digit numbers that are sets of 1000 and sets of 100.
P Complete activities ① and ②.

6 ⑤ Read numbers up to thousands place.

T Let's work in pairs or groups to read the numbers.
P Read the four-digit numbers ①-④ in pairs or groups and make corrections while listening to their friends.
T Assist pupils who have difficulties and confirm how to read 4-digit numbers.

7 ⑥ Write numbers in numerals.

T Let the pupils write the following numbers in words to numerals.
P Complete activities ①-④ by writing 4-digit numbers in words to numerals.
T/P Confirm the answers.

8 ⑦ Write the numbers in numerals based on the structure of numbers represented on a place value chart.

T Let the pupils write the following sets of numbers in numerals.
P Complete activities ①-④.
TN Remind pupils to pay attention to the places that do not have any values and confirm their answers by referring to the place value chart.

CONCLUSION

9 Summary.

T/P Summarise the lesson by confirming pupils' understanding of the main ideas in the lesson

Sample Blackboard Plan

Date: **Chapter 15:** Large Numbers **Sub-Chapter 1:** Numbers up to 10000 **Lesson** **Number**: 4/6

Main Task: 'Let's count, read and write numbers up to thousands place.'

Review

① Practice filling in the place value chart, carefully considering which place value is absent: 100, 10, 1

Activity

3 Let's count the number of blocks.

① There are 2 sets of 1000 and 3 sets of 100 so the total number of blocks is 2300.

Thousands place	Hundreds place	Tens place	Ones place
2	3	0	0

② How many sets of 100 are there in 2300?
There are 23 sets of 100 blocks.

4 Let's say the following numbers.
① 7 sets of 1000 is 7000.
② 60 sets of 100 is 6000.

5 Read the numbers.
① 6472 is read as Six thousand, four hundred seventy two.
② 3085 is read as Three thousand and eighty-five.
③ 1509 is read as One thousand, five hundred and nine
④ 7003 is read as Seven thousand and three.

6 Write in numerals.
① 3740 ② 7028 ③ 3001 ④ 5000

7 Write the following sets of numbers in numerals
① 3927 ② 6020 ③ 9001 ④ 1800

Summary

- To be able to read and write numbers up to one thousand, you have to understand the structure of a place value chart.

Unit 15

Unit: Large Numbers
Sub-unit: 1. Numbers up to 10000
Lesson 5 of 6

Textbook Page : p.193
Actual Lesson 146

Lesson Objectives

- To compare the sizes of 4-digit numbers.
- To understand the order and sequence of 4-digit numbers.

Prior Knowledge

- Lesson 4 understand the composition of 4-digit numbers.

Preparation

- Enlarged number line chart and also a place value chart.

Assessment

- To compare the sizes of 4-digit numbers. F
- To understand the order and sequence of 4-digit numbers. F

Teacher's Notes

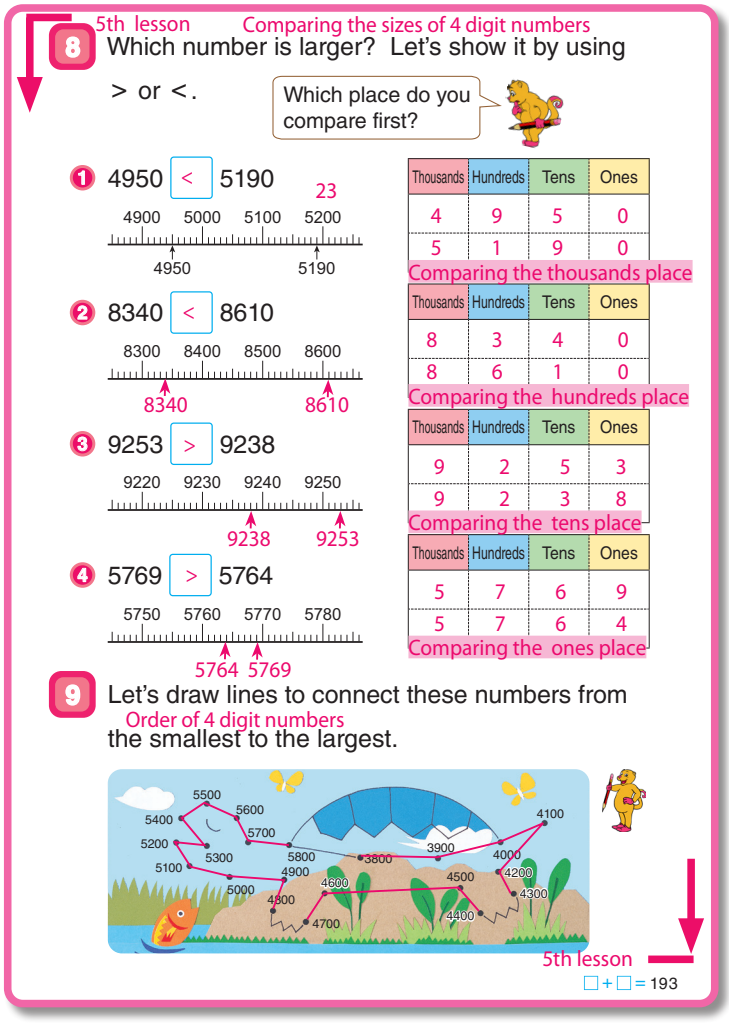
Use of Number line

A straight line with marked points that are equally spaced in every point on the line corresponds to a number is called a number line. On the number line, the number gets larger as you move towards the right.

The greater than (>), less than (<) and equal to (=) are called inequality signs.

Supplementary exercises

1. Fill each box □ with a number.
2. Find the numbers that can fit into □.
   There may be more than one answer.
   ① □ 236 is smaller than 4326.
   ② 9 □ 67 is larger than 9666.
   ③ 1073 is larger than 10 □ 5.



Lesson Flow

INTRODUCTION

1 Review.

T/P Review key ideas learnt in the previous lesson.

BODY

2 Introduce the Main Task.

T Introduce and explain the main task, 'Let's compare the sizes of numbers'.

3 8 Think about the sizes of numbers.

T Let the pupils think about the sizes of numbers.

TN Review how to look at a number line. Then post the activity 1 on the blackboard with an enlarged number line.

P Think about the sizes of numbers and realise that the numbers become larger towards the right.

P The marks are placed at an equal distance from each other.

P Complete activity 1.

Lesson Flow

T/P Place the given numbers in ❶ on the place value chart in the textbook to compare which number is larger.

TN Emphasise to pupils that; 1) they can first compare the sizes of the numbers in the thousand places; and 2) if they are the same, they can move down to the next places (the hundred places) and compare again.

4 Find which number is larger than the other by using signs and a place value chart.

T/P Let's find which number is larger by indicating it with an arrow on the number line.

TN Let the pupils study the given numbers on the number lines and advise them to be careful with the amount every mark indicates on each number line.

P Complete ❷, ❸ and ❹ by indicating the given numbers on the number lines by using an arrow and compare which number is larger by using the greater than and less than signs.

T Advise pupils to write down the given numbers in the place value charts in the textbook to compare which number is larger using signs and confirm their answers.

P Write the given numbers in the place value chart and compare which number is larger.

5 ❾ Draw lines to connect numbers.

T/P Read and understand the task.

P Connect the dots starting from the smallest number 3800 and complete the unknown shape.

TN Teacher checks with pupils that the numbers increase by 100.
If necessary, advise pupils to circle the numbers in the thousands and hundreds places, i.e. 38, 39, 40… so that they can easily recognise the numbers and their sequences.

CONCLUSION

6 Summary.

T/P Summarise the lesson by confirming pupils' understanding of the main ideas in the lesson.

Sample Blackboard Plan

Date: **Chapter 15:** Large Numbers **Sub-Chapter 1:** Numbers up to 10000 **Lesson Number**: 5/6

Main Task: 'Let's compare the sizes of numbers.'

Review

① Review on how to read and write numbers up to thousands place accordingly.
1. How many sets of 100 is in 8000?

Activity

8 Which number is larger? And which place do we compare first?

❶ 4950 < 5190

4900 5000 5100 5200
4950 5190

Thousands	Hundreds	Tens	Ones
4	9	5	0
5	1	9	0

❷ 8340 < 8610

8300 8400 8500 8600
8340 8610

❸ 9253 > 9238

9220 9230 9240 9250
9238 9253

❹ 5769 > 5764

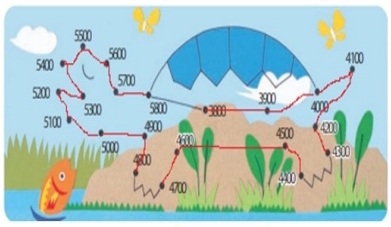
5750 5760 5770 5780
5764 5769

Thousands	Hundreds	Tens	Ones
8	3	4	0
8	6	1	0

Thousands	Hundreds	Tens	Ones
9	2	5	3
9	2	3	8

Thousands	Hundreds	Tens	Ones
5	7	6	9
5	7	6	4

❾ Let's draw lines to connect these numbers from the smallest to the largest.



Summary

- To compare the sizes of numbers;
1. First compare the sizes of numbers in the thousands place.
2. If they are the same, move down to the next lower place value.
3. The number becomes larger towards the right on the number line.

Unit 15

Unit: Large Numbers
Sub-unit: 1. Numbers up to 10000
Lesson 6 of 6

Textbook Page : p.194
Actual Lesson 147

Lesson Objectives

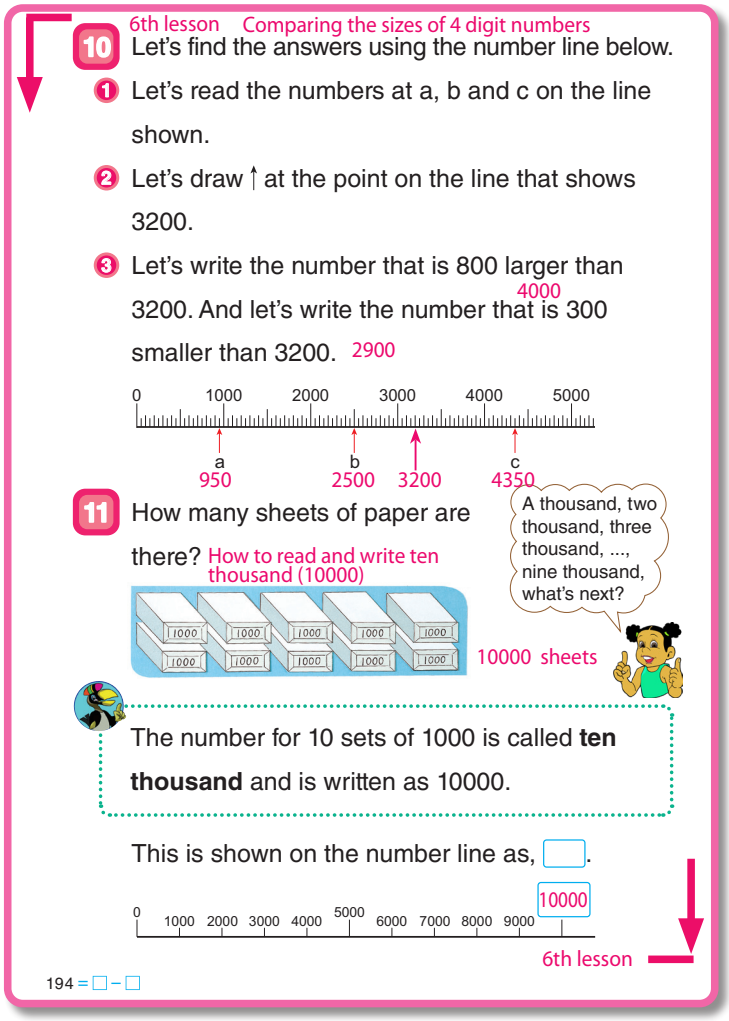
- To identify and read the numbers on a number line, and write the numbers on the number line.
- To recognise that the number for 10 sets of 1000 is called ten thousand (10000).

Prior Knowledge

- Using a number line and a place value chart to see the size of numbers and compare values and place values.

Assessment

- To identify and read the numbers less than 10 000 on a number line, and write the numbers on the number line. F S
- To understand and recognise that the number for 10 sets of 1000 is called ten thousand (10000). F S



Teacher's Notes

Teaching Tips: Introduction to 10000

Before they learn at school, pupils are already exposed to the expressions "thousand" or "ten thousand/tens of thousands" in their daily life situations.

However, many of them have used such expression without a proper understanding that 10000 is the equivalent of 10 sets of 1000. As an introduction of 10000 in the lesson, Teacher can use concrete materials such as sets of 1000 sheets of paper and have pupils actually count the sets by saying "one thousand, two thousand, three thousand, …, eight thousand, nine thousand, ten thousand".

Ten thousand place	Thousands place	Hundreds place	Tens place	Ones place

Teacher can also bring in a place value chart in lessons. Teacher should encourage pupils to use the charts and develop the activity into their possible realisation of place values that are larger than 10000.

Lesson Flow

INTRODUCTION

1 Review.
T/P Review key ideas learnt in the previous lesson.

BODY

2 Introduce the Main Task.
T Introduce and explain the main task, 'Let's think about the order and sequence of numbers on a number line'.

3 10 Think about the order and sequence of the numbers.

Lesson Flow

T Let's think about the order and sequence of the numbers.

P Study the number line and first think about the number of marks or scales on the number line. Find out the amount each scale or 1 small mark represents.

T Confirm with pupils that each small mark is for the amount of 50, and therefore, that two marks means the amount of 100.

P Complete activity 1.

T Check with the pupils that mark (a) is the number that is smaller than 1000.
Teacher can tell pupils to write the numbers in a place value chart.

P Complete activity 2 and 3.

T/P Let's draw an arrow to indicate 3200 on the number line.

P Locate the number that is 800 larger than 3200, by moving 800 to the right on the number line and move 300 to the left to locate the number that is 300 smaller than 3200.

4 11 Find how many sheets of paper are there.

T Let's look at the picture and identify the number of sheets of paper.

T Explain to pupils that they are already familiar with the amount of paper up to 9 sets of 1000 sheets, that is 9000 and inform them that they will look at the case of 10 sets in this lesson.

P Learn that as there are 1000 sheets of paper in each set, when there are 10 sets, it means 10000 sheets (ten thousand sheets).

P Write the number 10000 on the number line in which every mark indicates the amount of 1000.

TN Teacher confirms with pupils that the amount increases in 1000 increments on the presented number line and that the mark next to 9000 indicates the amount of 10000.

T Ask pupils to think of any situation that they know of where the unit "ten thousand (or 'tens of thousands') is used.

P Fourteen thousand (14,000) fun run t-shirts were distributed for the event.

P 10,000 kina was given to build new classrooms.

CONCLUSION

5 Summary.

T/P Summarise the lesson by confirming pupils' understanding of the main ideas in the lesson.

Sample Blackboard Plan

Date **Chapter 15:** Large Numbers **Sub-Chapter 1:** Numbers up to 10000 **Lesson Number**: 6/6

Main Task: 'Let's think about the order and sequence of numbers on a number line.

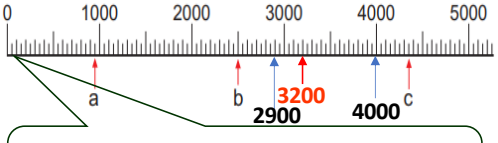
Review

① Review on how to use the number line and a place value chart to see the sizes of numbers and compare the value of numbers.

② Which number is larger? Show by using (>) or (<). a) 8610 ☐ 8340

Activity

10 Let's identify, read and write the numbers on a number line.



Study the number line and first think about the number of marks on the number line. Find out the amount each small mark represents.

Each small mark is the amount of 50 and two marks means the amount of 100.

1 Let's read at a, b and c on the number line.
a. 950 b. 2500 c. 4350

2 Let's draw an arrow that shows 3200 on the number line.

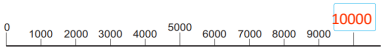
3 Let's write the number that is;
1) 800 larger than 3200.
Move 800 to the right and locate the number.
3200 + 800 = 4000
2) 300 smaller than 3200.
Move 300 to the left and locate the number.
3200—300= 2900

11 How many sheets of paper are there?



- 9 sets of 1000 is 9000.
- A thousand, two thousand, three thousand, …, nine thousand, what's next?

The number for 10 sets of 1000 is called **'ten thousand'** and written as 10000.
This is shown on the number line.



Summary

- 10 sets of 1000 is called ten thousand (10000).

Unit 15

Unit: Large Numbers
Exercise
Lesson 1 of 1

Textbook Page : p.195
Actual Lesson 148

Sub-unit Objectives
- To review what has been learnt.

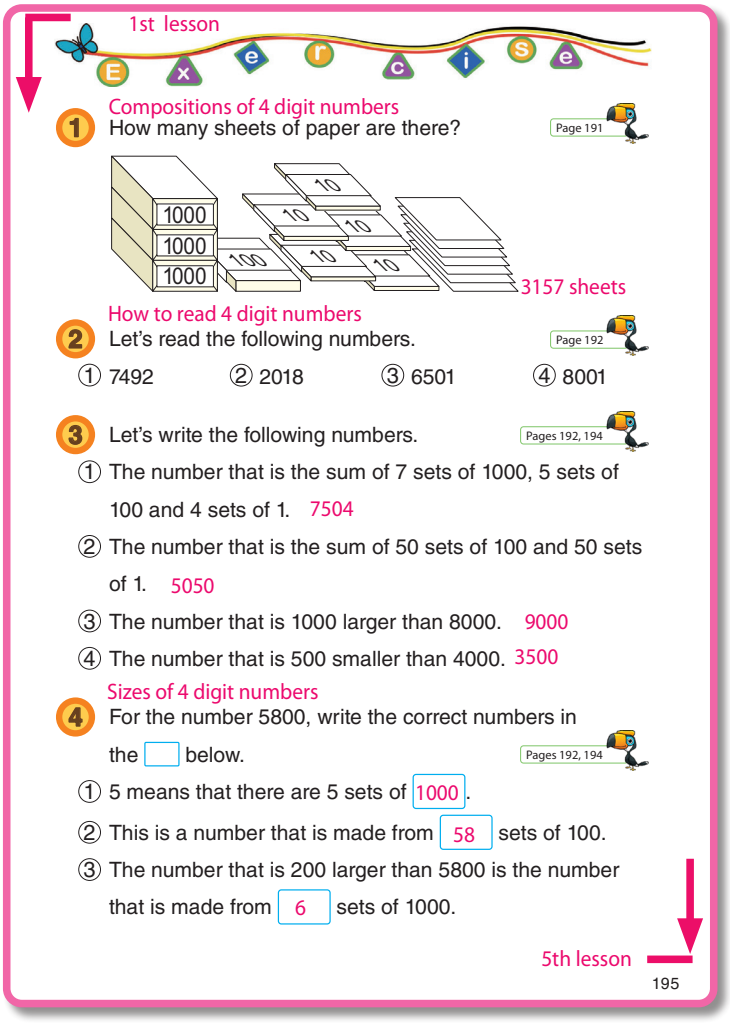
Lesson Objectives
- To review what has been learnt.

Prior Knowledge
- 4-digit numbers
- Sets of 100s and 1000s.

Preparation
- Sheets of papers in 1000s, 100s,10s and singles, place value table.

Assessment
- To correctly complete all exercises. S

Teacher's Notes
- This exercise is to evaluate pupils learning on the composition, sizes of 4-digit numbers.
- When pupils have difficulties refer them to what they have learnt already and assist them.
  The page numbers given in each exercise will direct the pupils to their learning of the contents.



1st lesson

Exercise

Compositions of 4 digit numbers

1 How many sheets of paper are there? Page 191

1000 1000 1000 100 10 10 10 10 10 10

3157 sheets

How to read 4 digit numbers

2 Let's read the following numbers. Page 192

① 7492 ② 2018 ③ 6501 ④ 8001

3 Let's write the following numbers. Pages 192, 194

① The number that is the sum of 7 sets of 1000, 5 sets of 100 and 4 sets of 1. 7504

② The number that is the sum of 50 sets of 100 and 50 sets of 1. 5050

③ The number that is 1000 larger than 8000. 9000

④ The number that is 500 smaller than 4000. 3500

Sizes of 4 digit numbers

4 For the number 5800, write the correct numbers in the ☐ below. Pages 192, 194

① 5 means that there are 5 sets of 1000.

② This is a number that is made from 58 sets of 100.

③ The number that is 200 larger than 5800 is the number that is made from 6 sets of 1000.

5th lesson

195

Lesson Flow

EXERCISE

1 The compositions of 4-digit numbers.

TN Ask pupils to count the numbers of the sets of 1000 sheets, 100 sheets, 10 sheets and separate pieces.
Tell pupils to write the identified number in a place value chart and confirm the answer.

P Write the identified number in a place value chart and confirm the answer.

2 How to read the presented 4-digit numbers.

TN Teacher tells pupils to write the identify number in a place value chart and confirm the answer.
With the problems ②, ③ and ④, pupils should be careful with the empty places in the numbers.

P Show how to read the presented 4-digit using the place value chart.

3 The compositions of 4-digit numbers.

TN With the problems ① and ②, get pupils to check their answers by using a place value chart.
With the problems ③ and ④, have pupils check their answers by using a place value chart or a number line. Pupils understanding should be reinforced in this way.

4 Identify the sizes of 4-digit numbers.

TN This is a basic problem on number compositions. Have pupils who have not fully understood to repeatedly practice identifying numbers by using number flashcards or place value charts.

Sample Blackboard Plan

Date: **Chapter 15:** Numbers up to 10000 **Sub-Chapter 2:** Exercise **Lesson Number**: 1/1

Main Task: Let's review to confirm what we have learnt in Numbers up to 10000.

Exercise

1 How many sheets of paper are there?



3 sets of 1000, 1 set of 100, 5 sets of 10 and 7 sets of 1 is 3157.

2 Let's read the following numbers.
①7492 is read as Seven thousand, four hundred ninety two.
②2018 is read as Two thousand and eighteen.
③6501 is read as Six thousand five hundred and one.
④8001 is read as Eight thousand and one.

3 Let's write the following numbers.
① 7 sets of 1000, 5 sets of 100 and 4 sets of 1 is 7501.
② 50 sets of 100 and 50 sets of 1 is 5050.
③ 1000 larger than 800 is 1000 + 8000 = 9000
④ 500 smaller than 4000 is 4000 — 500 = 3500

4 For the number 5800, write the correct numbers in the box.
① 5 means that there are 5 sets of 1000
② This is a number that is made 58 sets of 100.
③ The number that is 200 larger than 5800.
5800 + 200 = 6000
This number is now made from 6 sets of 1000.

Unit 15

Unit: Large Numbers
Problems 1 and 2
Lesson 1 of 1

Textbook Page : p.196~197
Actual Lesson 149

Sub-unit Objectives

- To review what has been learnt.

Lesson Objectives

- To review what has been learnt.
- To read the word problem and identify an appropriate number by using number flashcards.

Prior Knowledge

- To deepen the understanding of right angles through various activities by putting together a set-square and the right angle formed by folding the unshaped paper in the previous period, or by drawing a right angle using a set-square.

Preparation

- Mathematics blocks, Place value charts, Digital textbook software

Assessment

- Complete all the problems correctly. S

Teacher's Notes

Problems 1 can be given for homework and checked quickly in the next lesson while problems 2 can be administered during the lesson for pupils problem solving practice.

Lesson Flow

PROBLEMS 1

1 Write down the numbers.

T Have the pupils to write numbers by understanding the composition of 4-digit numbers.

P Develop the understanding on the composition of 4 digit numbers.



1st lesson

Compositions of 4 digit numbers

1 Let's write the numbers below.

① The number that is the sum of 8 sets of 1000 and 4 sets of 100 and 6 sets of 1. 8406

② The number that is the sum of 43 sets of 100 and 60 sets of 1. 4360

③ The number that is 1000 larger than 5000. 6000

④ The number that is 200 smaller than 7000. 6800

Sizes of 4 digit numbers

2 For the number 7400, let's write the correct numbers in the below.

① 7 means that there are 7 sets of [1000].

② This is a number that is [74] sets of 100.

③ The number that is 400 smaller than 7400 is [7] sets of 1000.

Compositions and sizes of 4 digit numbers

3 Let's write the correct numbers in the [ ] to make the answer 7620.

① The number that is [762] sets of 10.

② The number that is the sum of [7] sets of 1000 and [6] sets of 100 and [2] sets of 10.

③ The number that is the sum of [7] sets of 1000 and [62] sets of 10.

④ The number that is the sum of [76] sets of 100 and [2] sets of 10.

196



Making numbers with number cards

1 Various numbers can be made from 4 number cards of 0, 1, 2 and 3.

0	1	2	3

① Let's write the smallest number. 1023

(1) What is the numeral of the thousands place in this number? Let's explain why you choose this numeral as the number in the thousands place?

1 because it is the second smallest number after 0

(2) What is the numeral of the hundreds place of this number? Let's explain why you chose this numeral as the number in the hundreds place?

0 because it is the smallest number of the remaining 3 numbers (0, 2, and 3)

② Let's write the second smallest number. 1032

1st lesson

197

Lesson Flow

TN With the problems ① and ②, have pupils check their answers by using a place value chart. Pupils should be careful with the empty places in the numbers. With the problems ③ and ④, have pupils use a place value chart or a number line to properly recognise the numbers which are smaller or larger than certain numbers. The problem ④ can be challenging for some pupils.

② Fill the box with correct numbers.

T Have the pupils to write the correct numbers for the 7,400 by recognising the sizes of 4 digit numbers.

P Recognise the sizes of 4 digit numbers.

TN This problem is intended to assess pupils' understanding of the compositions of numbers. Encourage pupils to use a place value chart to confirm their answers. With the problem, instruct pupils to first identify the number that is 400 smaller than 7400 and then think how many sets of 1000 makes that number.

③ Fill the box with correct numbers.

T Have the pupils to write the correct numbers by recognising the compositions and sizes of 4 digit numbers.

P Recognise the compositions and sizes of 4-digit numbers.

TN ① First confirm with pupils the basic points that 10 sets of 10 is 100 and 100 sets of 10 is 1000. Then have pupils think about how many sets of 10 compose 7620.

② Tell pupils to think of a number in each place one by one.

③ Get pupils to think about how many sets of 10 compose 620.

④ Get pupils to think about how many sets of 100 compose 7600.

PROBLEMS 2

① Make various number from 4 number cards of 0, 1, 2 and 3 by understanding the composition of 4-digit numbers.

P Make 4-digit numbers using the number cards 0, 1, 2 and 3.

TN Have pupils to present the numbers they made.

① Let's write the smallest number.

T Get the pupils to write down the smallest number.

P Write the smallest number and explain why you chose this numeral.

TN Tell who in the class made the largest number.

P Think of which number should be in the thousands place and explain the reason.

P Think of which number should be in the hundreds place and explain the reason.

② Let's write the second smallest number.

P Write the smallest number and explain why you chose this numeral.

Sample Blackboard Plan

Date: **Chapter 15:** Numbers up to 10000 **Sub-Chapter 3:** Problems **Lesson Number**: 1/2

Main Task: Let's review to confirm what we have learnt in Numbers up to 10000.

Problem 1

① Let's write the following numbers.
① 8 sets of 1000, 4 sets of 100 and 6 sets of 1 is 8406.
② 43 sets of 100 and 60 sets of 1 is 4360.
③ 1000 larger than 5000 is 1000 + 5000 = 6000
④ 500 smaller than 4000 is 7000 — 200 = 6800

② For the number 7400, write the correct numbers in the box.
① 7 means that there are 7 sets of [1000]
② This is a number that is made [74] sets of 100.
③ The number that is 400 smaller than 7400.
7400 — 400 = 7000
This number is now made from [7] sets of 1000.

③ Let's write the correct numbers in the box to make the answer 7620.
① [762] sets of 10.
② [7] sets of 1000, [6] sets of 100 and [2] sets of 10.
③ [7] sets of 1000 and [62] sets of 10.
④ [76] sets of 100 and [2] sets of 10.

Problem 2

① Various numbers can be made from 4 number cards of 0, 1, 2, 3 and 4

0	1	2	3

① Write the smallest number including 0.
Answer: 1023
1. What is the numeral in the thousand place in this number? 1 is in the thousands place.
2. What is the numeral in the hundreds place in this number? 0 is in the hundreds place.

② Let's write the second smallest number.
Answer: 1032

Unit 15

Unit: Large Numbers
Have you ever seen it?
Lesson 1 of 1

Textbook Page : p.198
Actual Lesson 150

Lesson Objectives
- To discover the idea of dividing equal pieces of something.

Prior Knowledge
- Daily experiences of sharing.

Preparation
- Enlarged pictures for posting on the board.

Assessment
- Explain situations about dividing equal pieces of something in our daily life experiences. F



Teacher's Notes

Scenes of Shapes noticed in Daily live and saround the world.

(1) First of all, pupils look at the pictures and discuss with their friends the scenes described in the pictures. Teachers lets pupils recognise a particular phenomenon of "fractions shown in everyday experiences and also think of dividing things such as cake, sandwich into equal pieces and compare. In reality there may be certain things that cannot be divided equally that is why we have children fighting over a bigger piece when not shared equally.

(2) This activity can closely link with what pupils see in their daily lives to the learnings in the next unit Fractions will be introduced in the next unit therefore this is just a pre-discussion on prior learning about fraction in the next chapter.

Lesson Flow

INTRODUCTION

1 Review

T/P Review key ideas from previous lesson.

BODY

2 Introduce the main task.

T Introduce and explain the main task, 'Let's discuss the kind of situation in the pictures.'

3 Discuss the images shown in the pictures.

T/P Let the pupils look at the picture on the top of p.198 of the textbook and discuss what kind of situation this is.

T What are they doing in the picture?

P There are 4 children.

P Mother is cutting the cake into some slices.

P She is cutting the cake into 4 slices to give to 4 children equally.

TN Teacher tells pupils to look at the pictures of the cake, sandwich and fried fish and discuss what they notice about how each of them is cut and divided.

P Discuss the pictures.

P Expected responses:

- Picture 1 shows that the cake is divided into 4 pieces.
- Picture 2 shows that the sandwich is also divided into 4 pieces equally.
- Picture 3 shows the sandwich is also divided into 4 pieces equally.
- Picture 4 shows that the fried fish is divided into 4 pieces, however, if this fried fish is divided into 4 pieces equally, I think we have to fight for a bigger piece.
  It seems difficult to divide the fried fish into equal sizes.

TN Teacher has pupils realise that the cake and sandwich are divided into 4 equal pieces while fried fish is not.

4 Discuss similar situations in daily life experiences.

T/P Let's discuss whether we have seen situations like this in our daily life experiences.

TN Instruct the pupils to freely discuss the pictures they choose from the textbook on page 198 of the textbook and share their daily life experiences freely.

CONCLUSION

5 Summary.

T/P Summarise the lesson by confirming pupils' understanding of the main ideas in the lesson.

TN Help pupils to conclude that the pictures show the ideas of dividing into equal pieces.

Sample Blackboard Plan

Date: **Chapter 15:** Numbers up to 10000 **Sub-Chapter 3:** Problems **Lesson Number**: 1/1

Main Task: Let's discuss the images shown in the pictures.

Review

① Review rules and patterns used to make a bigger multiplication table.

Activity

① What do you see?

Picture 1



- There are 4 children.
- Mother is cutting the cake into some slices.
- She is cutting the cake into 4 slices to give to 4 children equally.

Picture 2



- Shows that the cake is divided into 4 equal pieces.

Picture 3



- Shows that the sandwich is also divided into 4 equal pieces.

Picture 4



- Shows that the fried fish is divided into 4 pieces but I don't know if this fried fish is divided equally. I think we have to fight for a bigger piece if it is like this. It seems difficult to divide the fried fish ito equal sizes.

Summary

- Pictures shows the idea of dividing into equal sizes.

End of Chapter Test: Chapter 15 **Date:**

Evaluation: Chapter 15 Large Numbers	Name:	Score /100

[10 points for each question]

1. Write the following sets of numbers in numerals.

(1) A number contains 5 sets of 1000, 3 sets of 100, 9 sets of 10, and 1 set of 1.

_____

(2) A number contains 10 sets of 1000.

_____

(3) A number contains 65 sets of 100.

_____

2. Which number is larger? Show it by using > or <.

(1) 9329 _____9351 (2) 5232_____5322 (3) 8045 _____8054

3. Write in numerals

(1) Three thousand seven hundred and forty-five _____

(2) Six thousand and twenty-eight _____

(3) Five thousand and one _____

(4) Six thousand _____

Chapter 16 Fractions

1. Unit Objectives

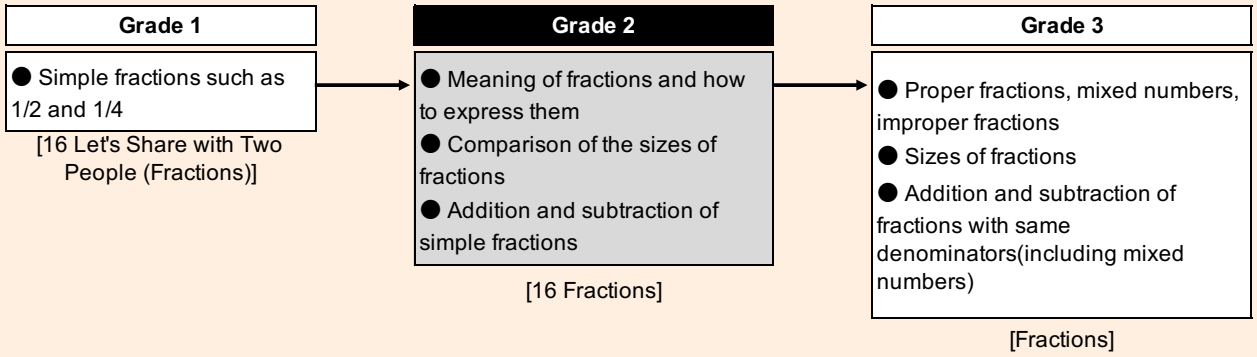
- To understand the meaning and the representations of numbers, and extend their ability to use numbers.
- To get to know simple fractions such as $\frac{1}{2}$ and $\frac{1}{4}$.

2. Teaching Overview

As for the meaning and representation of fractions, it will be a full-fledged learning aiming for its establishment from the 3rd grade.
This unit in the grade 2 will serve as a foundational instruction for understanding fractions, and will deal with simple fractions such as $\frac{1}{2}$ and $\frac{1}{4}$.
Pupils will acquire a sense of “one part of a thing that is divided into the same size” through activities such as actually folding paper in half and cutting it into two pieces to overlap them.

Key Concepts: Meaning and representation of fraction and addition and subtraction of simple fraction.

3. Related Learning Contents



Unit 16

Unit: Fractions
Sub-unit: 1. Representation of Fractions
Lesson 1 of 4

Textbook Page : p.199~200
Actual Lesson 151

Sub-unit Objectives

- To understand the meaning and the representation of fractions through hands on activity such as folding of square papers, colouring, how to write a fraction numerically.
- To learn the difference in when the original length of tapes are not the same.

Lesson Objectives

- To understand the meaning and the representations of fractions by folding square papers into two parts of the same size.
- Learn the term 'half' and know how to write 'half' as a numeral; $\frac{1}{2}$

Prior Knowledge

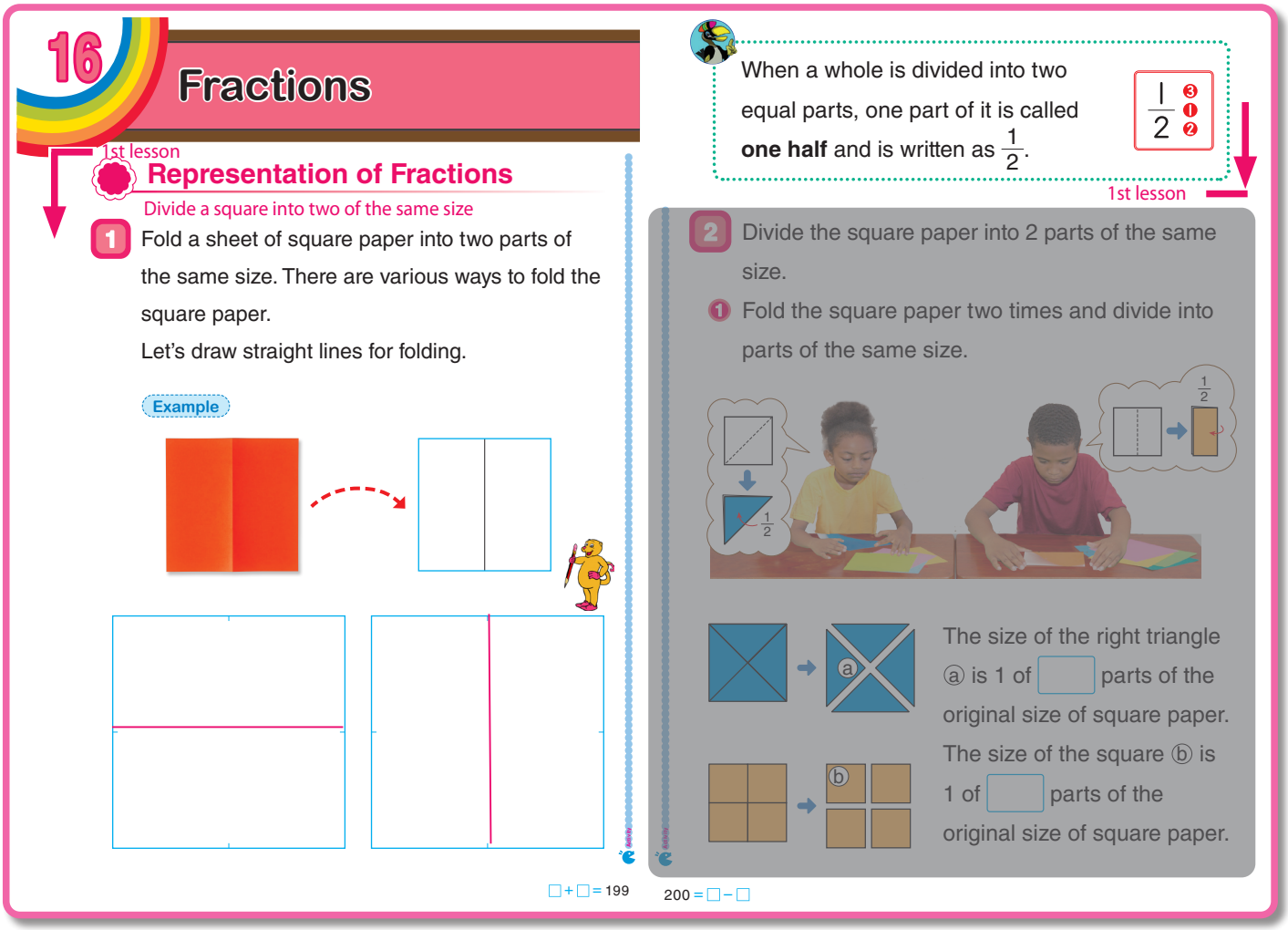
- Chapter 14 Shapes
- Making patterns-use the idea of making patterns by drawing rectangles, squares, right angle triangles using dots that form a pattern. This demonstrates the construction of two parts of the same size together forms the image of the whole shape such as a square when two right angle triangles are drawn. The repetition of drawing of this shape then forms beautiful patterns.

Preparation

- Enlarged square papers (for display), origami papers to be distributed to pupils, scissors
- improvise A4 papers cut into squares

Assessment

- Divide a square into two parts of the same size. F S
- Understand and write half as a numeral. F S



Lesson Flow

INTRODUCTION

1 Review.

T/P Review known knowledge learnt in the previous grade level.

T Get the pupils to look at the pictures on p.199 of the textbook and ask If they have ever seen such ways of cutting something. And ask for the reasons as to why people cut things in such a way.

P The reason why people cut something in this way is to share the same size piece of cake amongst a number of people that attend a birthday.

T Tell the pupils that we may recognise some of these shapes being used in this lesson.

BODY

2 Introduce the main task.

T Introduce and explain the main task, "Let's think of how to fold a piece of square paper into two parts of the same sizes".

3 (1) Think of how to fold a square paper.

T How can you fold a piece of square paper into two parts of the same size?

TN Teacher first shows a square paper to have pupils think about how they can fold the square paper into two parts of the same size and distribute papers for students to visualise how they can fold their papers.

P After thinking of various ways of folding the square paper, do the actual folding and draw straight lines where it was folded into two parts of the same size.

T/P Compare all the possible ways to fold and make sure the ones folded are into two of the same size.

4 Meaning of one half.

T/P Read the important point in the .....

T Let the pupils learn how to write and read $\frac{1}{2}$.

P Practice writing $\frac{1}{2}$ and reading it as one half.

T Explain the meaning of one half.

TN Fractions are often difficult notation for pupils to understand.
Carefully teach how to write fractions.

CONCLUSION

5 Summary.

T/P Summarise the lesson by confirming pupils' understanding of the main ideas in the lesson.

Due to space limitations, the Teacher's Notes is placed on page 344.

Sample Blackboard Plan

Date: **Chapter 16:** Fractions **:Sub Chapter/Topic** Representation of Fractions **Lesson Number**: 1 of 4

Review

Refer to page 83 of the text book

Main task

Let's think about how to fold a sheet of square paper into two parts of the same size

Various ways to fold



Write one half.

$\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$

Summary

One part of a thing that is divided into two parts of the same size is called one half.
It is written as $\frac{1}{2}$

Unit 16

Unit: Fractions
Sub-unit: 1. Representation of Fractions
Lesson 2 of 4

Textbook Page : p.200~201
Actual Lesson 152

Lesson Objectives

- To better understand the meaning and the representations of fractions
- Divide a square paper into four of the same size parts from the original paper.
- Name the 4 divided parts of the same size as 'one fourth' and written as $\frac{1}{4}$.

Prior Knowledge

- Folding square papers into half of the same size.
- Pupils understood the meaning and the representations of fractions from the folding of a square papers into two parts of the same size.
- One half $\left(\frac{1}{2}\right)$

Preparation

- Enlarged square papers (for display), square papers to be distributed to pupils, scissors.

Assessment

- Divide a square into four of the same size. F S
- Divide a square into eight of the same size. F S

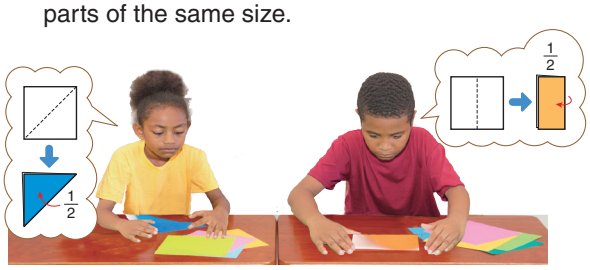
When a whole is divided into two equal parts, one part of it is called **one half** and is written as $\frac{1}{2}$.

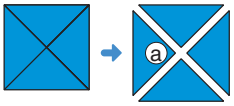
$\frac{1}{2}$ ③ denominator ① ② numerator

2nd lesson

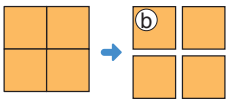
2 Divide the square paper into 2 parts of the same size.
Divide a square into four of the same size

1 Fold the square paper two times and divide into parts of the same size.





The size of the right triangle ⓐ is 1 of 4 parts of the original size of square paper.



The size of the square ⓑ is 1 of 4 parts of the original size of square paper.

200 = □ − □

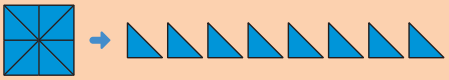
One part of a thing that is divided into 4 equal parts is called **one quarter** (or **one fourth**) and is written as $\frac{1}{4}$. Numbers like $\frac{1}{2}$ and $\frac{1}{4}$ are called **fractions**.

2 Fold the square paper in **1** one more time and cut into equal parts. How can we say the size which is 1 of how many parts of the original size of the square paper? Let's explain your reasoning. $\frac{1}{8}$

You can picture the shape if a folded line is drawn on the square paper before cutting.

Because we got 8 pieces of the same size

Yamo's idea



Fold the square paper made in **1** into half and open it. There are 8 triangles. Cut them up and put them on top of each other. They are all of the same size.

The size of the is $\frac{1}{8}$ of the original square paper.

3 What happens to the other square paper after it is folded? $\frac{1}{8}$

2nd lesson

□ + □ = 201

Lesson Flow

INTRODUCTION

1 Review.

T/P Review key ideas learnt in the previous lesson.

BODY

2 Introduce the main task.

T Introduce and explain the main task, 'Let's fold a square paper twice'

3 (2) Divide a square paper into 4 parts of the same size.

T "How can you fold a piece of square paper twice to have all the divided parts of the same size?"

P Response: "Fold the square paper twice to get 4 parts of the same size."

T (1) Guide the pupils to cut the square paper along the straight lines where it was folded to get 4 parts of the same size.

P Cut the square paper to confirm that there are four parts of the same size by stacking them.

4 Define what fraction is made from folding the square paper twice.

T/P Recap pupils' learnt knowledge on how to write and read $\frac{1}{2}$.

TN Teacher asks pupils, based on the explanation of $\frac{1}{2}$, how to describe one part of one thing that is divided into four parts of the same size.

P One part of a thing divided into four parts of the same size is one fourth or one over four.

TN Not all pupils will be able to express the term "one fourth" at this stage so the important point needs to be explained clearly.

T/P Read and understand the important point in the .

T Let the pupils know that 'half' $\left(\frac{1}{2}\right)$ and one-fourth $\left(\frac{1}{4}\right)$ are also numbers and are called 'fractions'.

5 Divide the square into 8 parts of the same size.

P (2) Think of how to describe one part of one thing that is divided into eight parts of the same size.

TN Based on the explanations of $\frac{1}{2}$, $\frac{1}{4}$, pupils should realise that $\frac{1}{8}$ is one part of one thing that is divided into eight parts of the same size.

TN Teacher focuses attention on pupils' responses if there are some keywords like 'same size' or 'eight parts' as mentioned in Yamo's idea on page 201.

T Get the pupils to share their experience about what happens to the other pieces of square-papers after it is folded in once, twice and 3 times.

CONCLUSION

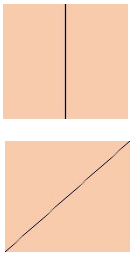
6 Summary.

T/P Summarise the lesson by confirming students' understanding of the main idea of the lesson.

Sample Blackboard Plan

Date: **Chapter 16:** Fractions :**Sub Chapter/Topic** Representation of Fractions **Lesson Number**: 2 of 4

Review



One half or $\frac{1}{2}$

Main task

Let's fold the paper twice or three times to get all the divided parts of the same size

Various ways to fold

Write one fourth.

1 Fold twice   $\frac{1}{4}$

2 Fold three times   $\frac{1}{8}$

$\frac{1}{2}$, $\frac{1}{4}$ and $\frac{1}{8}$ are numbers called 'fraction'

3 What happens to the other square paper after it is folded?

More parts of the same size is made.

Summary

- One part of a thing that is divided into four parts of the same size is called one fourth. It is written as $\frac{1}{4}$
- $\frac{1}{2}$, $\frac{1}{4}$ and $\frac{1}{8}$ are called 'fractions'.

Unit 16

Unit: Fractions
Sub-unit: 1. Representation of Fractions
Lesson 3 of 4

Textbook Page : p.202
Actual Lesson 153

Lesson Objectives

- To better understand the meaning and the representations of fractions through activities of colouring.
- Colour one-fourth of the original paper and one -eight of the original paper is coloured.
- Label the coloured part out of the 4 same size parts as $\frac{1}{4}$ and one out of 8 same sized parts as $\frac{1}{8}$.

Prior Knowledge

- One part of a thing that is divided into 2 equal parts is called half.
- One part of a thing that is divided into 4 equal parts is called one fourth
- Numbers like $\frac{1}{2}$ and $\frac{1}{4}$ are called fractions

Preparation

- Colored pencils, large flash cards of 'half and one fourth'

half	$\frac{1}{2}$	One fourth	$\frac{1}{4}$

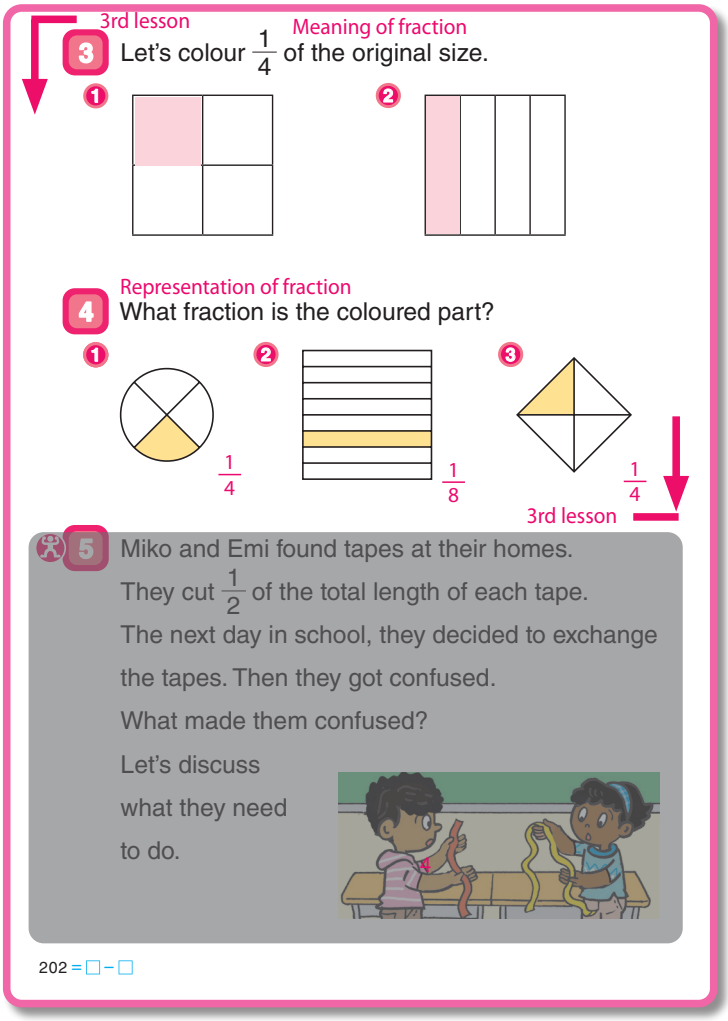
- Enlarged pictures of 3 and 4.

Assessment

- Represent a fraction by colouring: $\frac{1}{4}$, $\frac{1}{8}$ on various diagrams. F S
- Write the fraction of the coloured parts. F S
- Describe the one part of the 4 same sized parts that is coloured and the one part of the 8 same sized parts that is colour. F S

Teacher's Notes

Task 3.
Pre-drawn diagrams of the 3 1 can be done on square papers (cut from A4 paper) for every pupil to be used in the main activity.
In this lesson pupils familiarise themselves with the fractions learnt in the previous lesson. Through the activity pupils confirm their understanding of $\frac{1}{4}$ is one part of 4 equal parts or one eighth is one part of 8 equal parts. (4 2).



Lesson Flow

INTRODUCTION

1 Review.

T/P Review the key ideas from the previous lesson.

BODY

2 Introduce the Main task.

T Introduce and explain the main task: Let's color $\frac{1}{4}$ of the original size.

3 ❸ Colour one fourth $\left(\frac{1}{4}\right)$ parts.

T Get the pupils to colour one fourth $\left(\frac{1}{4}\right)$ of the four parts in ❶.

P Do Exercise 3 by colouring one fourth $\left(\frac{1}{4}\right)$ parts of the original paper size.

TN Some pupils might not fully understand the meaning of $\frac{1}{4}$. So first have the pupils do activity ❶ to make sure of the expected level of understanding among pupils is established.

T Ask these questions for better understanding;

- "How many parts of the same size are made from the original paper?" (4 parts of the same size)
- "How many parts of the original size is coloured?" (1 part is coloured)
- "How many parts of the original size not coloured?" (3 parts of the same size are not coloured)

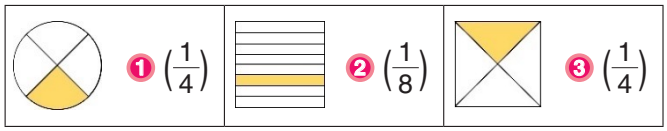
P Respond to the questions asked and do activity ❷. Compare with a friend.

T Check and confirm pupils' work.

4 ❹ Find what fraction is the coloured part.

T Get the pupils to use the idea of colouring one fourth $\left(\frac{1}{4}\right)$ to identify the fraction that is coloured.

P Express the colored parts using fractions by drawing the diagrams and writing the fraction of the coloured parts.



T/P Check and confirm pupils' work.

T Makes sure that pupils are able to count the number of parts divided into parts of the same size.

P Count the coloured parts and state that;

❶ is divided into 4 parts of the same size and only 1 is coloured.

❷ is divided into 8 parts of the same size and only 1 is coloured.

❸ is divided into 4 parts of the same size and only 1 is coloured.

CONCLUSION

5 Summary.

T/P Summarise the lesson by confirming students' understanding of the main idea of the lesson.

Sample Blackboard Plan

Date: **Chapter 16:** Fractions **Sub Chapter/Topic** Representation of Fractions **Lesson Number:** 3 of 4

Review

What is this number called?

Q1. $\frac{1}{2}$

Answer: half

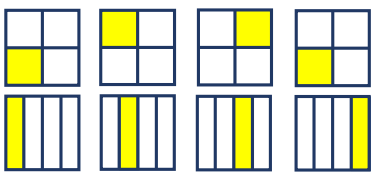
Q2. $\frac{1}{4}$

Answer: one fourth

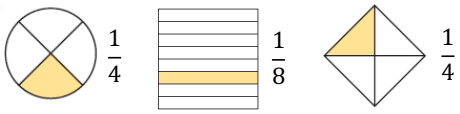
Main task

Let's colour 1/4 of the square paper size.

3 Colour ¼ of the original size *(various options)*



4 What fraction is coloured?



Summary

- Coloured 1 part out of 4 same parts is $\frac{1}{4}$
- Coloured 1 part out of 8 same parts is $\frac{1}{8}$

Unit 16

Unit: Fractions
Sub-unit: 1. Representation of Fractions
Lesson 4 of 4

Textbook Page : p.202
Actual Lesson 154

Lesson Objectives

- Learn the difference in $\frac{1}{2}$ when the original lengths of the tapes are not the same.
- Cut lengths of tapes in $\frac{1}{2}$ and compare with each other.

Prior Knowledge

- Half $\left(\frac{1}{2}\right)$ the same size as the other part.
- Half $\left(\frac{1}{2}\right)$ is one part of a thing that is divided into 2 parts of the same size.

Preparation

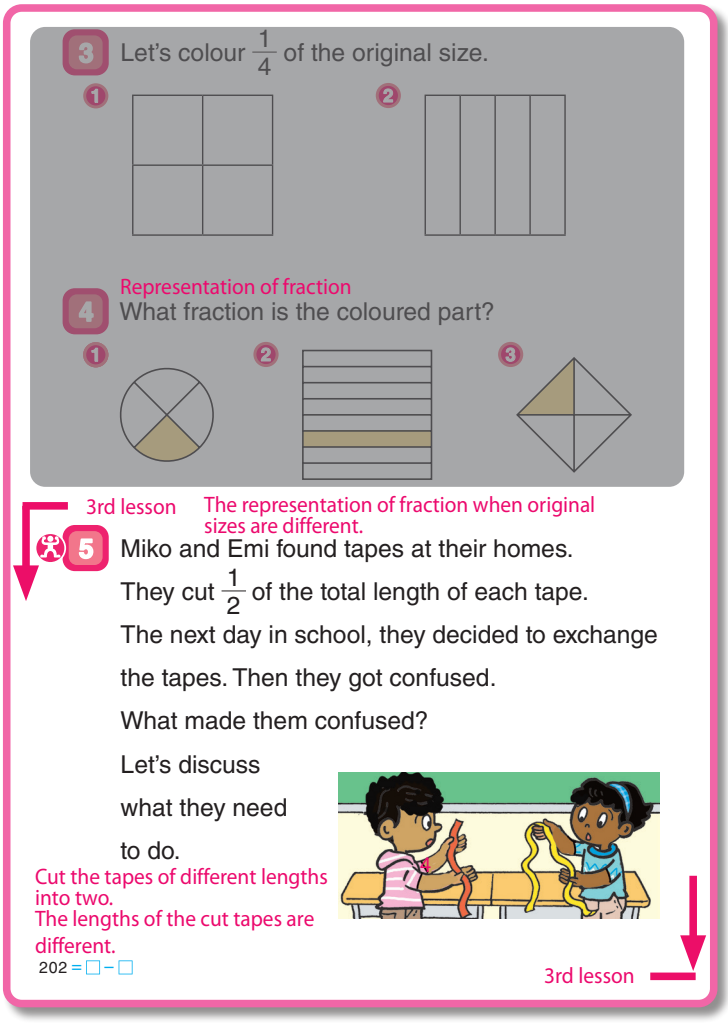
- Tapes for display, tapes distributed to pupils, scissors

Assessment

- Cut the various lengths of tape in halves and compare the lengths of different halves. F
- State that the original length of the tapes are different in length size before cutting. F S

Teacher's Notes

Pupils need to understand that half $\left(\frac{1}{2}\right)$ is part of the same of the other part of a whole. However, when dealing with 'lengths' pupils may mis-conceptualise that one half of a length is the same size as the half of another length when the original lengths are different. As in the lesson pupils will compare different the half length of more half-length strips of tapes amongst their peers.
You should have two strips of tape of different lengths that will be cut into equal halves.
This demonstration can be done at the end of the lesson to assess and affirm pupils thinking that when the lengths of the original sizes are different the size of the half lengths are also different.



p.338 Teacher's Notes

Selection and preparation of teaching and learning materials (TLMs) for grouping activities

Letting Pupils Express Themselves

The ability of expression or expressing for themselves is one of the priorities in mathematics education for pupils to foster throughout their learning in the early grades. On p.201, the section of Yamo's idea asks pupils how to describe $\frac{1}{2}$ of $\frac{1}{4}$ of original size of the origami and explain why it becomes $\frac{1}{8}$. It is ideal to let all pupils in the class to have an opportunity to either orally or in writing express themselves in responding to these questions.

Writing down ideas is relatively easy for all pupils to express themselves because they could individually do so in their exercise book.

Lesson Flow

INTRODUCTION

1 Review.

T/P Review the key ideas from the previous lesson.

BODY

2 Introduce the main task.

T Introduce and explain the main task: "Let's think about what the children are talking about after exchanging their tapest".

3 5 Understand the problem.

T/P Read the situation on p.202 and discuss what the pupils are doing in the scenario.

T Ask the question: "what do you think the pupils are doing?"

P Possible responses;
1: The pupils are talking about the strips of tapes.
2: the pupils are comparing the size of the tapes

TN Let the pupils to express what is not clear to them.

4 Cut and compare $\frac{1}{2}$ lengths of a tape.

T Distribute tapes of several different lengths to the pupils and have them cut them into half.

P Cut the distributed tapes into $\frac{1}{2}$ and compare the lengths of their own tapes with other pupils.

T Ask: "What do notice about the lengths of the tape after comparing with your friends?"

P Responses:
- The length of my tape is different from my friends.
- I think the length of the tapes distributed by the teacher are not the same.

5 Discuss why the $\frac{1}{2}$ length tapes are different from the other.

T/P Paste $\frac{1}{2}$ length tapes and discuss why their $\frac{1}{2}$ length strip of tape is different from their friends.

P Match the two $\frac{1}{2}$ lengths to see the original length of the strip of tape and compare it with the other original lengths of tape distributed by the teacher.

T Ask the pupils to discuss and realise that the original length of the strips of tape were not the same.
Therefore, when they cut the tapes in half, the lengths of the $\frac{1}{2}$ were not the same when compared with other tapes even though they are $\frac{1}{2}$.

TN The pupils use the different $\frac{1}{2}$ lengths of tape to place alongside the original length.
They should realise that:
- There are several different lengths that were cut into $\frac{1}{2}$ lengths of tape.
- The size of the $\frac{1}{2}$ of tape is not the same in length with another $\frac{1}{2}$ of another tape.

CONCLUSION

6 Summary.

T/P Summarise the lesson by confirming pupils' understanding of the main ideas in the lesson.

Sample Blackboard Plan

Date: **Chapter 16:** Fractions **Sub chapter/Topic:** Representation of Fractions **Lesson Number:** 4 of 4

Review

Q1



What fraction is coloured?

1) One-fourth ($\frac{1}{4}$)

2) One- eight ($\frac{1}{8}$)

Q2 :



How many equal sized parts are there?

1) 4 equal parts

2) 8 equal parts

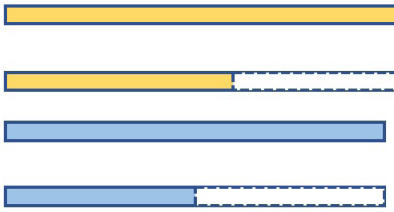
Main task

5 **Let's think about what the children are talking about after exchanging their tapes**

The lengths are same, because both are $\frac{1}{2}$

The lengths of the two are different

Match the two $\frac{1}{2}$ lengths to see the original length



Summary

- When the original lengths of the tapes are not the same the sizes of $\frac{1}{2}$ are different.

Unit 16

Unit: Fractions
Problems
Lesson 1 of 1

Textbook Page : p.203
Actual Lesson 155

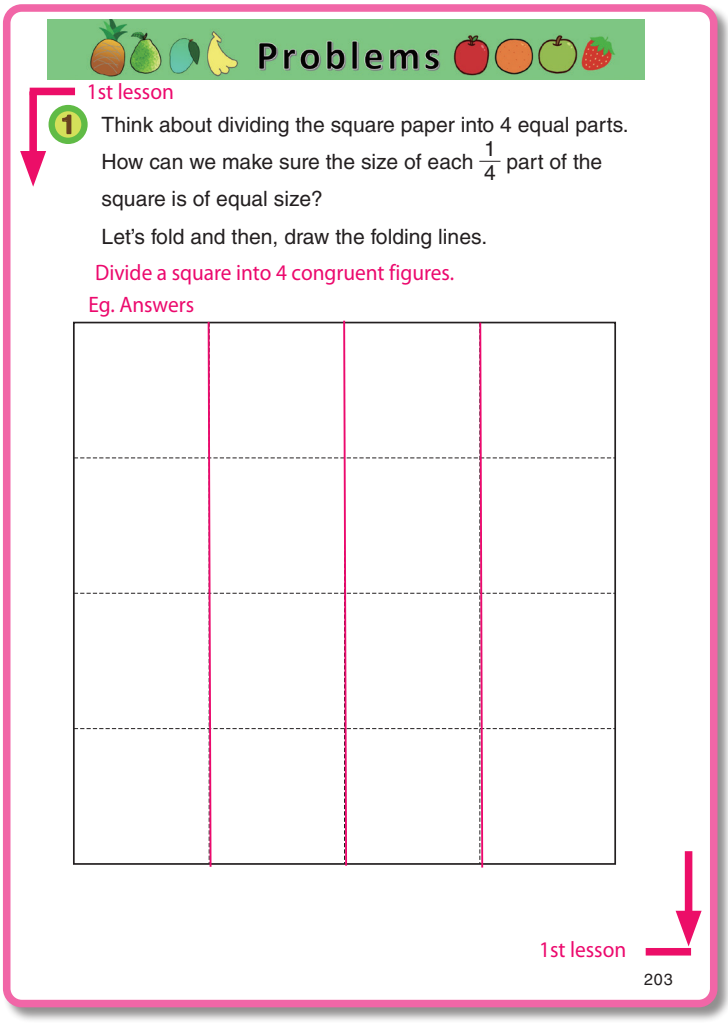
Lesson Objectives
- To review and deepen the understanding of what has been learnt.

Prior Knowledge
- Half $\left(\frac{1}{2}\right)$ is one part of a things that is divided 2 parts of the same size.
- Learnt the difference in $\frac{1}{2}$ when the original lengths of the tapes are not the same.

Preparation
- Printed copy of the Problem 1 activity

Assessment
- Divide a square into 4 congruent figures. S
- Solve the problem to confirm what they have learnt in this unit. S

Teacher's Notes
This lesson focuses on the pupil's ability to use the learnt concepts of dividing a square paper into 4 or even 8 equal parts.
As pupils engage they recognise the basic shape and how many pieces that form a large shape.


Problems

1st lesson

1 Think about dividing the square paper into 4 equal parts.
How can we make sure the size of each $\frac{1}{4}$ part of the square is of equal size?
Let's fold and then, draw the folding lines.

Divide a square into 4 congruent figures.

Eg. Answers

1st lesson

203

Lesson Flow

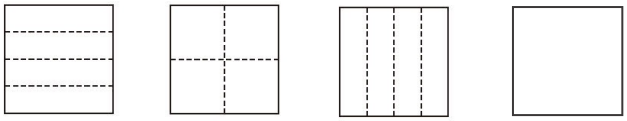
PROBLEMS

1 Divide a square into 4 equal parts.

T/P Read and understand the problem on p.203 of the textbook.

T Distribute several papers with squares printed, and let pupils actually fold the papers into four.

P Think of how to fold a square origami into four parts of the same size and fold some papers into four equal parts.
Possible ways of folding;



T Get the pupils to draw straight lines on the square paper on p.203 to show how they folded their paper.

P Express ideas on how to divide the square paper into four parts of the same size.

T Let the pupils first express their ideas to the other pupils who are next to each other, then present their ideas to the whole class.

P Express their ideas on how to divide the square origami paper into four equal parts.

T Compliment pupils who divide the papers in a creative manner.

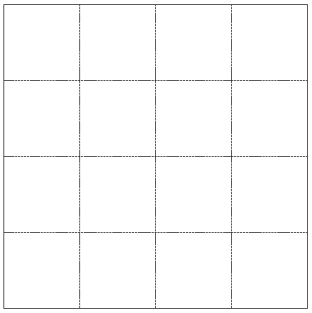
TN Allow pupils the opportunity to express their reasons why they think the four divided parts are the same shapes and size.

Sample Blackboard Plan

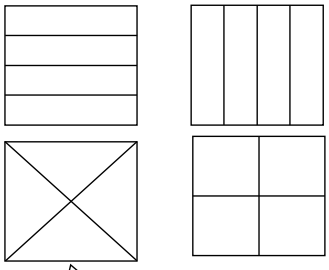
Date: **Chapter 16:** Fractions **Sub chapter/Topic:** Problems **Lesson Number**: 5 of 5

Problem

1 Fold and draw the folding line to divide into 4 equal parts.



Display pupil's work



I folded the paper 2 times and 4 same size rectangles

I folded the square paper 2 times and made 4 same size squares

I folded the square paper 2 times and made 4 same size triangles

Express your ideas on how to divide the square paper into four parts of the same size.

Summary

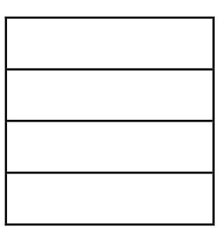
Folding square papers to make 4 same size shapes.

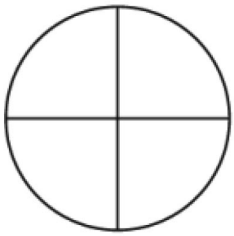
End of Chapter Test: Chapter 16 **Date:**

Evaluation: **Chapter 16** Triangles and Quadrilaterals Fractions	Name:	Score /100

1. Shade a quarter of the original size. [10 points for each question]

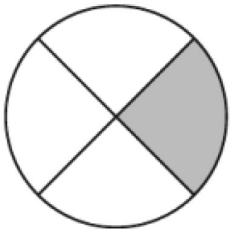
(1) (2)

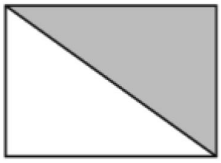


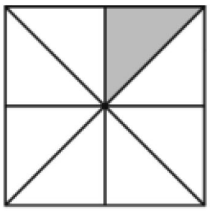


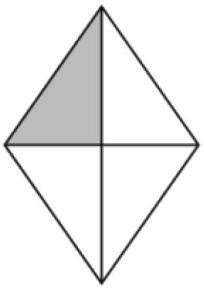
2. What fraction of the whole is the coloured area? [10 points for each question]

(1) (2) (3) (4)





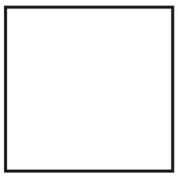


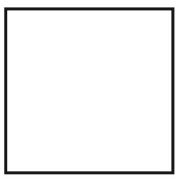


_____ _____ _____ _____

3. Let's divide into quarter two different ways? [20 points for each question]

Way 1 Way2





Chapter 17 Shapes of Boxes

1. Unit Objectives

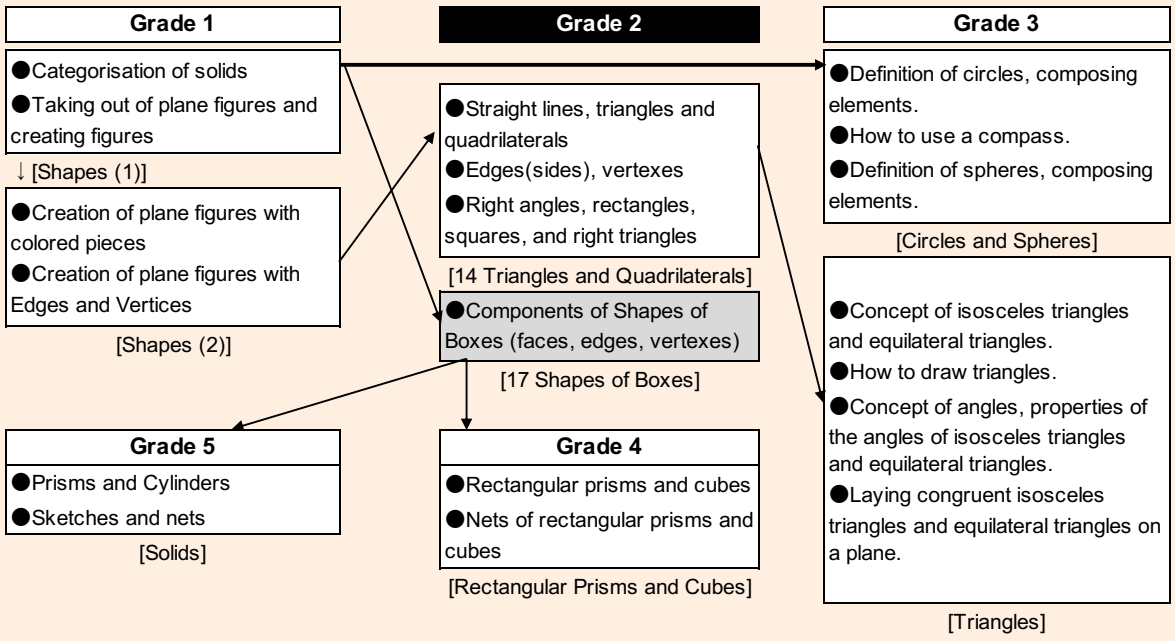
- To get to know the elements composing figures through activities such as observing the shapes of boxes.
- To pay attention to the elements composing a box such as vertex, edge, and face through the observation of the shapes of box, and to understand the numbers of such elements and the nature of the shapes of box.
- To trace faces of the shape of box or the shape of the dice, cut out faces, put all the faces together that are opened up, and fold them to make a box.
- To note that solid figures are composed of plane figures.

2. Teaching Overview

In the 1st grade, pupils grasped the shapes and characteristics of objects.
For example, pupils were able to classify them according to their shapes, such as box shapes, cylinder shapes, ball shapes, by focusing on their forms by rolling and stacking objects.
Also, through activities that involve tracing various faces of objects, they have recognised shapes such as circles, triangles, and squares.
In the 2nd grade, pupils will focus on the constituent elements of vertices, edges, and faces so that they can examine their numbers and the shapes of faces.
They engage in activities such as observing and disassembling objects in the shape of a box, constructing box shapes by combining squares and rectangles, and using sticks to construct box shapes.

Key Concepts: Elements of the composition of a box and shapes that compose a box.

3. Related Learning Contents



Unit 17

Unit: Shapes of Boxes
Sub-unit: 1. Make a Nice Box
Lesson 1 of 6

Textbook Page : p.204~205
Actual Lesson 156

Sub-unit Objectives

- To learn about the elements that compose a box such as the vertex, edge and faces and the number of vertices, edges and face it has.
- To understand the nature of the shape of a box by observation how the number of vertices, edges and face compose the shape of a box
- To learn that solid figures are composed of planes figures and compose a box with these figures.

Lesson Objectives

- To understand the elements composing a box such as the shape and the number of faces through the activity of tracing faces of the shape of a box.
- To understand how the faces are connecting each other to compose the shape of a box.

Prior Knowledge

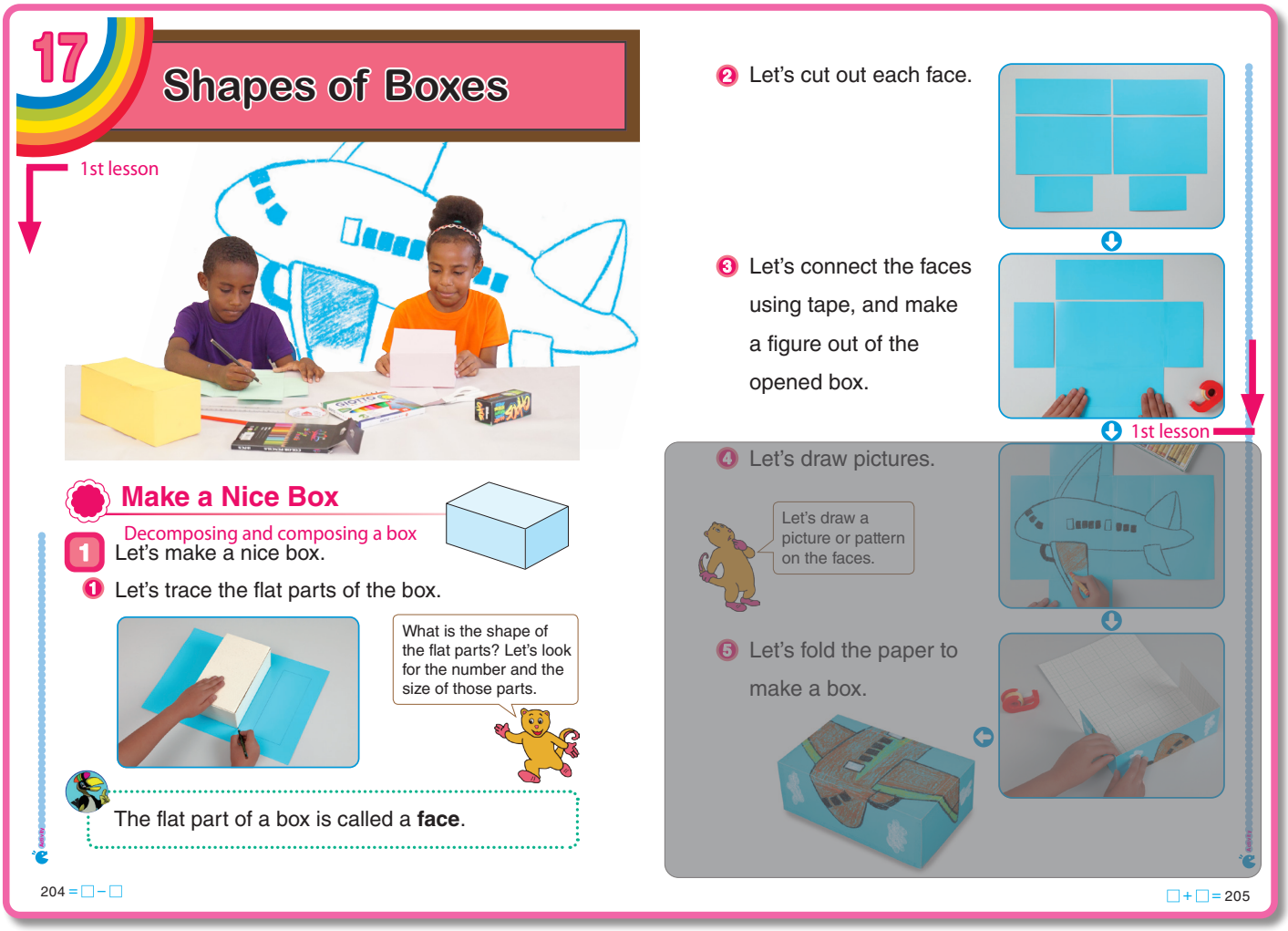
- Chapter 14 Triangles and Quadrilaterals- Rectangles and square

Preparation

- Boxes, drawing paper, scissors, ruler, 3D/three-dimensional model

Assessment

- Identify the elements of composing a box such as the shape and number faces through tracing. F S
- Describe how the faces connecting each other to compose the shape of a box. F S



Lesson Flow

INTRODUCTION

1 Pre-discussion about the pictures.

T Get the pupils to discuss about what they see in the picture on p.204 of the textbook.

P Express what they see freely.

BODY

2 Introduce the main task.

T Introduce and explain the main task, 'Let's think about how to make a nicely shaped box'.

3 ① Think about the necessary elements to make a nicely-shaped box.

T/P Read the task ① together.

T What kind of shapes are composing (make up a box) a box?

P Think about the necessary elements that make a nicely-shaped box and share their ideas.

T Introduce the term 'face' as flat parts of the box, then the shapes and the number of faces.

4 Trace and cut flat parts of the box.

T Let's trace all the faces of the box.

P ① Choose a box and trace all the flat parts of the box.

P ② Cut out the traced faces and lay the cut out faces together.

T Let's examine the shapes of faces and count them.
Compare your faces with those of the other pupils.

T/P Talk about the shapes of the box.

TN Have the pupils put the faces over the other faces, or lay those out together in order to better understand the shape of faces.
They also understand the flat part of a box is called face.

5 Arrange the faces to make a figure of a box.

T ③ Let the pupils think about various ways of laying the faces out to make a box when folding all the faces.

T Find arrangements of the faces, by laying them connect the faces using a tape and make a figure out of an open box.

CONCLUSION

6 Summary.

T/P Summarise the lesson by confirming pupils' understanding of the main ideas in the lesson.

Sample Blackboard Plan

Date: **Chapter 17**: Shapes of Boxes **Sub-chapter:** Make a Nice Box **Lesson Number**: 1 of 6

Main Task: **Let's think about how to make a nicely shaped box.**

Pre-discussion

- Discussion points of what the pupils see in the picture.

Activities

1 Let's make a nice box.

1. What kind of shapes make up a box?

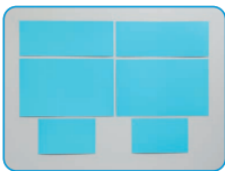
Pupils' Idea here.

The flat part of the box is called **face**.

① Let's trace the flat parts of the box.

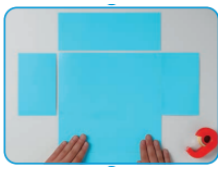


② Let's cut out each face.



The cut out shape has;
- 6 faces
- 3 pairs of the faces with the same size.

③ Let's connect the faces using a tape and make a figure out of the opened box.



Summary

- The 6 faces are connected to make up a figure. (box)

Unit 17

Unit: Shapes of Boxes
Sub-unit: 1. Make a Nice Box
Lesson 2 of 6

Textbook Page : p.205
Actual Lesson 157

Lesson Objectives

- To draw a picture on the faces that are opened up and make a nicely-shaped box.
- Lay out different nets of a box.

Prior Knowledge

- Composing a box.
- Name the elements of composing a box such as shape and number of faces.
- Explain faces that connect to each other to compose a box.

Preparation

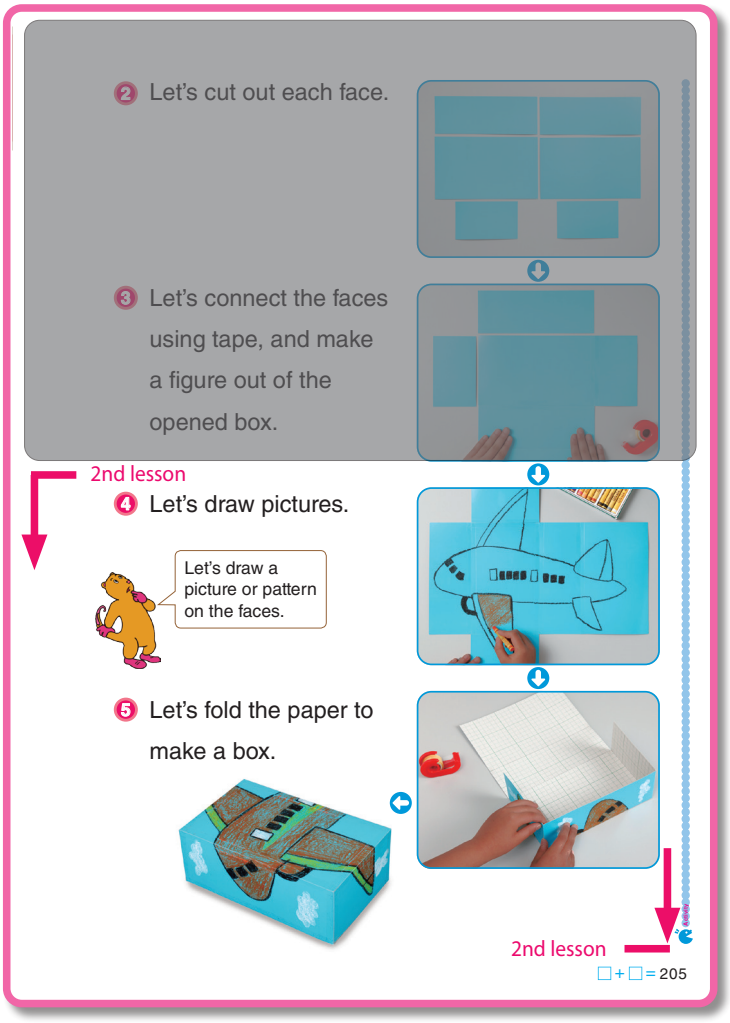
- Boxes, drawing paper, scissors, scotch tape, crayon, 3D/three-dimensional model

Assessment

- Draw a picture on faces of an opened-up box and make a shaped box. F

Teacher's Notes

Teacher should assist pupils to layout their face of the box (cuboid) prior to drawing and encourage the pupils to draw their picture within the 6 faces of the opened-up box. Pupils will have various good points, teacher should pay attention to how well they describe the faces, the shape and sizes that connect to compose a box in regard to the way pupils have laid faces.



Lesson Flow

INTRODUCTION

1 Review.

T/P Review key ideas learnt in the previous lesson.

BODY

2 Introduce the main task.

T Introduce and explain the main task, 'Let's think about how to lay out the 6 faces and draw the picture on the faces.'

3 Draw pictures on the box faces.

T Let's decide what you want to draw, then decide how to lay the 6 faces out so that it is a good shape to draw on.

TN Assist the pupils to lay out the faces of the boxes prior to drawing their picture.

P ④ Draw the picture on the box faces.

TN Advise pupils that when they are drawing their pictures, they will draw an enlarged image to cover the 6 faces and do not draw different pictures on each face.

4 Compose the box.

T Let's fold the faces to make a box.

P ⑤ Fold the faces to make a box.

P Tape the edges of the faces and make sure it becomes a box.

TN Assist pupils to tape the edges of faces when making the box.

5 Observe each other's folded boxes.

T Get the pupils to look carefully at the boxes, and find what is good about the other boxes.

P Look at other's boxes and share the good points about the other boxes.

TN Remind pupils to pay attention not only to pictures and designs but also the shape and size of the faces.

CONCLUSION

6 Summary.

T/P Summarise the lesson by confirming pupils' understanding of the main ideas in the lesson.

Sample Blackboard Plan

Date: **Chapter 17**: Shapes of Boxes **Sub-chapter:** Make a Nice Box **Lesson Number:** 2 of 6

Main Task: **Let's think about how to lay out the 6 faces and draw the picture on the faces.**

Review

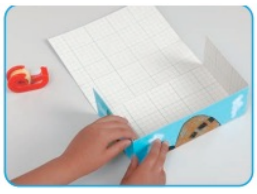
- The flat part of the box is called _____.
- How many faces did we trace, cut and connect?
- What kind of figure did we make?

Activities

④ Let's draw pictures.



⑤ Let's fold the paper to make a box.





Summary

- Draw the pictures within the 6 faces of the opened-up box.
- The 6 faces were connected to have a box shape with the pictures.

Unit 17

Unit: Shapes of Boxes
Sub-unit: 1. Make a Nice Box
Lesson 3 of 6

Textbook Page : p.206
Actual Lesson 158

Lesson Objective

- To think of the characteristics of faces composing a box, and how to lay them out through various activities.

Prior Knowledge

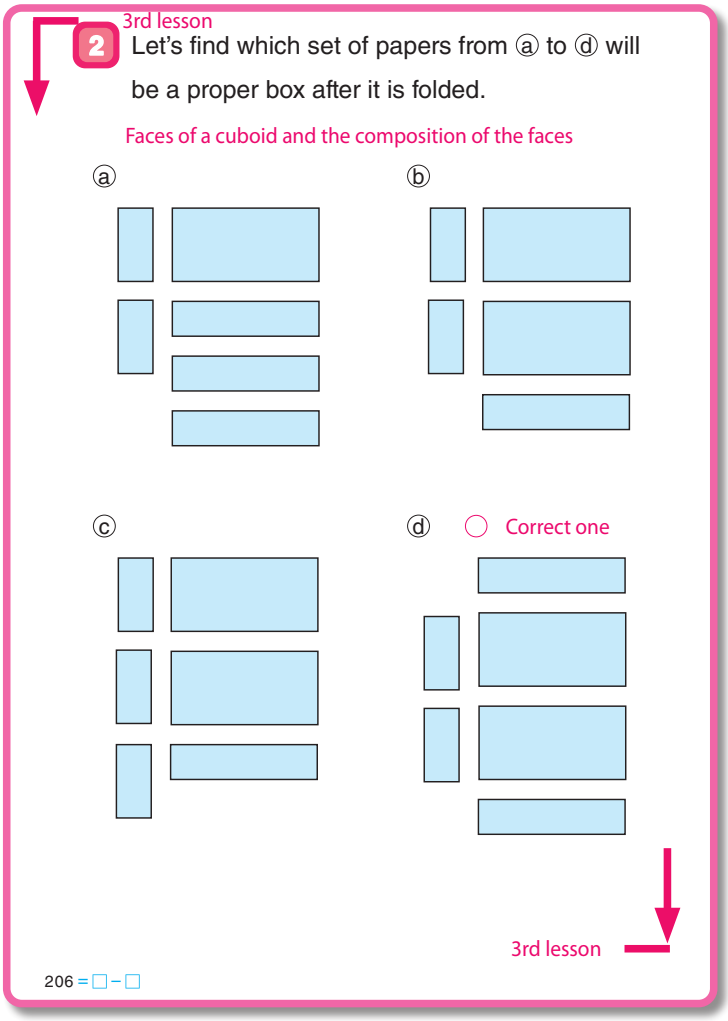
- Draw a picture on the faces that are opened up and make a nicely-shaped box.
- Lay out different nets of a box.

Preparation

- Rectangles for display (same size and numbers with the exercises on p.206), photocopies of the textbook, boxes made by each pupil, scissors.

Assessment

- Draw faces of a box and the composition of the faces. F S
- Identify the characteristics of faces that compose a box. F S



Teacher's Notes

Faces of box (cuboid) and composition.
In this lesson pupils are challenged with the understanding of what elements composes a box (cuboid) and how a box is made when connected or folded.
Teacher should assist pupils to see the shape and size, the number of faces and should be able to lay them out to form a net of a box when it is connected together.

Lesson Flow

INTRODUCTION

1 Review.

T/P Review key ideas from previous lesson.

BODY

2 Introduce the Main task.

T Introduce and explain the main task "Let's find which group of faces ⓐ, ⓑ, ⓒ or ⓓ will be a box after being folded."

3 2 Which set of papers from ⓐ to ⓓ will be a proper box after it is folded?

TN Teacher has pupils first think, then actually do it through folding the paper.

T Let the pupils think about the number of faces needed to make a box.

P Discuss if 5 faces or 6 faces are needed to make a box.

T Let the pupils think about the shape of faces to make a box.

P Discuss how many faces with the same size are necessary to construct a box.

4 Fold the sets of faces to make a box.

T Let the pupils think about the four exercises to make a box.

P Trace the faces of a box, cut them out, and make a box by folding them.

TN Teacher has pupils think and present the way to lay out shapes that will become a box after being folded.

CONCLUSION

5 Summary.

T/P Summarise the lesson by confirming pupils' understanding of the main ideas in the lesson.

Sample Blackboard Plan

Date: **Chapter 17**: Shapes of Boxes **Sub-chapter:** Make a Nice Box **Lesson Number:** 3 of 6

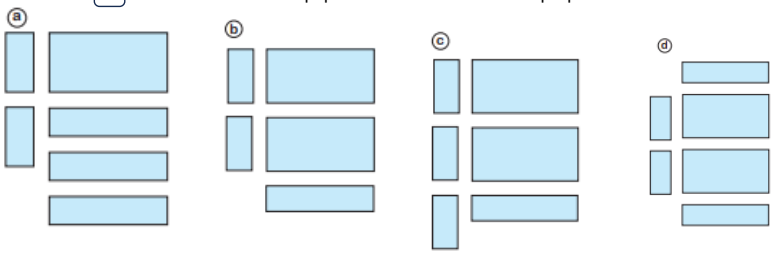
Main Task: Let's find which group of faces a. b, c or d will be a box after being folded.

Review

- Let's share what we did in our previous lesson.

Activities

2 Let's find which set of papers from 'a' to 'd' will be a proper box after it is folded.



Summary

- To be a box there are 6 faces and there are 3 pairs of faces of the same size.

Unit 17

Unit: Shapes of Boxes
Sub-unit: 1. Make a Nice Box
Lesson 4 of 6

Textbook Page : p.207
Actual Lesson 159

Lesson Objectives

- To understand the characteristics of composing elements of a box such as face, edge/side, and vertex.

Prior Knowledge

- Faces of a box and the composition of the faces
- Identify the characteristics of faces that compose a box.

Preparation

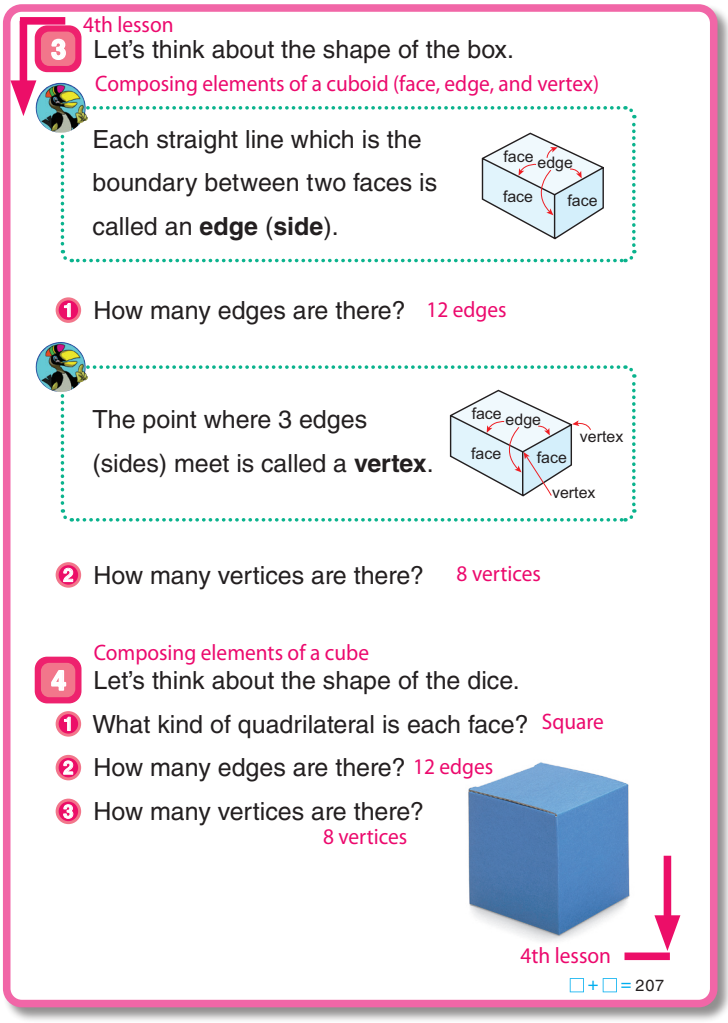
- Boxes made by each pupil, 3D/three-dimensional models for a teacher and pupils.

Assessment

- To compose elements of a cuboid. F S
- To compose elements of a cube (face, edge, vertex). F S

Teacher's Notes.

Instruction on face, edge, and vertex In the 3rd lesson, pupils learn about face, edge, and vertex. The face is introduced as a flat surface. Through several exercises, Teacher has pupils note that a cuboid has 6 faces with three pairs of 2 faces with the same size and shapes that are facing each other, and a cube has 6 faces with the same size. Teacher makes use of actual objects when teaching the meaning of edge and vertex.



Lesson Flow

INTRODUCTION

1 Review.

T/P Review key ideas from previous lesson.

BODY

2 Introduce the Main task.

T Introduce and explain the main task, 'Let's examine the shape of the box you made.'

3 ③ Understand the meaning of edge/side.

T/P Read the important point in the [ ].

P Know that a straight line between two faces is called edge/side.

TN Explain clearly so that the pupils understand the definition of edges.

T ① How many edges are there?

P Identify the number of edges by using the box that they made by themselves.

TN Make sure pupils identify and see that a box has 12 edges.

4 Understand the meaning of vertex.

T/P Read the important point in the [ ].

P Know that the point where 3 edges meet is called vertex.

TN Explain clearly so that the pupils understand the definition of vertex.

T ② How many vertices are there?

P Identify the number of vertices by using the box that they made by themselves.

TN Make sure pupils identify and see that a box has 8 vertices.

5 ④ Examine the shape and the number of faces, and vertices of a die.

T "Let's think about the shape of a dice and find the number of faces, and vertices."

P Pupils examine and present their findings by using the shape of the die or any other model.

6 Compare the shape of faces and the number of faces and vertices between the shape of the dice and other boxes.

T Ask pupils to do activity ①, ② and ③.

P Complete activities.

TN Ensure that pupils find and summarise what the similarities and differences are between boxes and the shape of the dice in terms of faces, edges, and vertices.

CONCLUSION

7 Summary.

T/P Summarise the lesson by confirming pupils' understanding of the main ideas in the lesson.

Sample Blackboard Plan

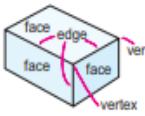
Date: **Chapter 17**: Shapes of Boxes **Sub-chapter:** Make a Nice Box **Lesson Number:** 4 of 6

Main Task: Let's find which group of faces a. b, c or d will be a box after being folded.

Review

- Set of papers are folded to become a box when there are _____ faces and there are 3 pairs of faces of the _____ size.

The point where 3 edges (sides) meet is called **vertex**.



② How many vertices are there? 8 vertices

4 Let's think about the shape of the dice.



① What kind of quadrilateral is each face? square

② How many edges are there? 12 edges

③ How many vertices are there? 8 vertices

Summary

- Similarities.

	CUBE	CUBOID
Faces	6	6
Edges	12	12
Vertices	8	8

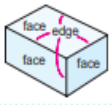
- Differences.

	CUBE	CUBOID
Faces	Square shape	Rectangular shape
Edges	Equal lengths	Different lengths

Activities

3 Let's think about the shape of the box.

Each straight line which is the boundary between two faces is called **edge (side).**



① How many edges are there? 12 edges

Unit 17

Unit: Shapes of Boxes
Sub-unit: 1. Make a Nice Box
Lesson 5 of 6

Textbook Page : p.208
Actual Lesson 160

Lesson Objective

- To find the characteristics and the number of vertices and edges by making a box with sticks and balls of clay.

Prior Knowledge

- Composing elements of a cuboid (face, edge, vertex).
- Composing elements of a cube (face, edge, vertex).

Preparation

- Prepare 1 Set of materials for each small group (Clay, 4 Sticks of 4 cm, 8 cm, and 10 cm, 12 Sticks of 5 cm), boxes made by each pupil, a box with sticks and balls of clay for display

Assessment

- To find the characteristics and the number of vertices and edges by making a box with sticks and balls of clay. F S

Teacher's Notes

Making a Box with Sticks and Balls of Clay

Through the activity of making a box with sticks and balls of clay, pupils pay better attention to the characteristics of "edges" and "vertices".

Making a solid figure with edges and vertices helps pupils better understand the nature of a solid figure (3D figure).

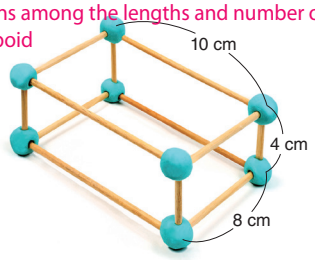
Teacher should let pupils think how to use sticks and balls to make a box, what lengths of sticks and how many of them they need, and how many balls they need to prepare.

It is helpful to use a box with sticks and balls for display.

5th lesson

5 Make a box with sticks and balls of clay.

Relations among the lengths and number of edges and vertices in a cuboid



1 What are the lengths of sticks in cm and how many sticks are needed?

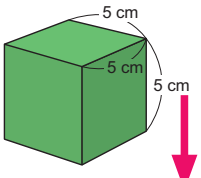
Lengths of sticks (cm)	Number of sticks
10 cm	4 sticks
8 cm	4 sticks
4 cm	4 sticks

2 How many balls of clay do you need? 8 balls

Exercise

The box on the right is made of sticks and balls of clay. How many sticks are needed? How many balls of clay are needed?

12 sticks
8 balls



5th lesson

208 = □ − □

Lesson Flow

INTRODUCTION

1 Review.

T/P Review key ideas from previous lesson.

BODY

2 Introduce the Main task.

T Introduce and explain the main task, 'Let's make a box with sticks and balls of clay'.

3 5 Think about how to make a box with sticks and clay/plasticine.

T Show a box with sticks and balls of clay, then pupils think about how many sticks and balls they need to make it.

P Think about what kind of materials they need to make a box with sticks and balls of clay.

T Let the pupils think of the lengths of sticks and how many they need.

P 1 Write down the lengths of the sticks in cm and the number of them in the matrix on p.208, then present it.

4 Measures of clay/plasticine

T Let the pupils think about how many balls of clay/ plasticine they need.

P 2 Pupils present the number of balls of clay they think they need.

T Get the pupils to make a box with sticks and balls of clay by paying attention to the relationships between edges and sticks, as well as between vertices and balls of clay.

P Each group makes a box focusing their attention to connecting the sticks (edges) and balls of clay (vertices) and present what they notice while making a box.

5 Make the shape of the die.

T Let the pupils do the exercise to make the shape of the die with sticks and balls of clay.

P Think about how many sticks needed and how many balls of clay or plasticine needed.

TN Teacher has pupils make the shape of the die by comparing the shape of the box.

CONCLUSION

6 Summary.

T/P Summarise the lesson by confirming pupils' understanding of the main ideas in the lesson.

Sample Blackboard Plan

Date: **Chapter 17**: Shapes of Boxes **Sub-chapter:** Make a Nice Box **Lesson Number:** 5 of 6

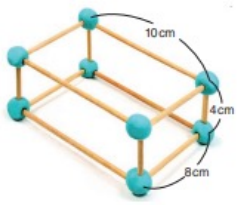
Main Task: Let's make a box with sticks and balls of clay.

Review

- Each straight line which is the boundary between two faces is called _____(side).

Activities

5 Make a box with sticks and balls of clay..



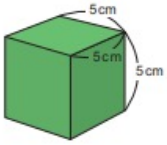
1 What are lengths of sticks in cm and how many sticks are needed?

Lengths of sticks	Number of sticks
cm	sticks
cm	sticks
cm	sticks

2 How many balls of clay do you need?

Exercise

The box on the right is made of sticks and balls of clay. How many sticks are needed? How many balls of clay are needed?



Summary

- **It is easier to make the shape of a die than that of a box because of the sticks with the same length.**

Unit 17

Unit: Shapes of Boxes
Sub-unit: 1. Make a Nice Box
Lesson 6 of 6

Textbook Page : p.209
Actual Lesson 161

Lesson Objective

- To cut out faces from a grid paper to make a box without a top.

Prior Knowledge

- Relations among the lengths and number of edges and vertices in a cuboid, 12 edges, 8 vertices.

Preparation

- Grid sheet/Square paper, scissors, ruler, sticky tape

Assessment

- Cut out faces from a grid paper to make a box without a top. F S

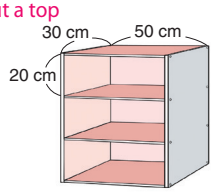
Teacher's Notes

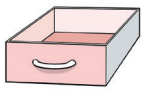
How to cut out faces on the grid paper.
There are 49 cells of 10 cm^2.
We need to cut out faces as follows:
Bottom: $3 \times 5 = 15$ cells
Front/back: $(2 \times 5) \times 2 = 20$ cells
Right/left: $(2 \times 3) \times 2 = 12$ cells
Total: 47 cells of 10 cm^2.
When cutting out faces from this grid paper, 2 cells remain not to be used
(49 cells − 47 cells = 2 cells).
When having pupils draw lines on the grid paper, leaving 2 cells not used is correct way of drawing lines.

6th lesson
Making Drawer

Composition of faces of a box without a top

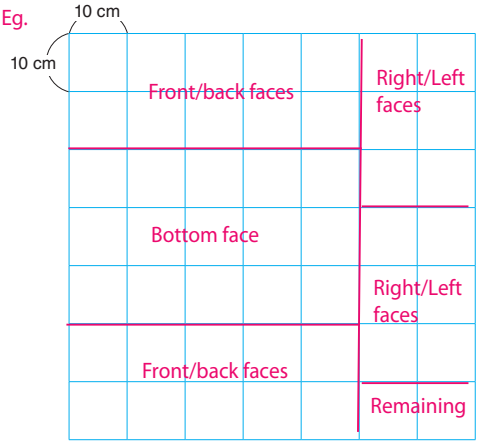
6 There is a chest drawer as shown on the right. Let's think of drawers that will fit in the slots without a top.





How can you cut all the faces needed to make the drawer from the thick paper below? Let's draw the faces that you want to cut out.

Eg.



6th lesson

□ + □ = 209

Lesson Flow

INTRODUCTION

1 Review.

T/P Review key ideas from previous lesson.

BODY

2 Introduce the Main task.

T Introduce and explain the main task, 'Let's make a box without a top.'

3 6 Think about the size of each face composing a box without a top.

T/P Read and understand the task.

T Let's think about the size of each face to compose a box without a top.

P Think about the size of each face to compose a box without a top.

TN Ensure pupils understand that there are 5 faces because this box has no top.

4 Think about the size and the number of faces of the box.

T Get the pupils to think about the size and the number of bottom, front/back sides, and right/left sides.

P Present the number and the size of faces.

- Bottom 30 cm × 50 cm 1 face.
- Front/back 20 cm × 50 cm 2 faces.
- Right/left 20 cm × 30 cm 2 faces.

5 Think about how to cut these 5 faces from the grid paper.

P Think about how to cut out these 5 faces from the grid paper.

P Draw lines on the grid paper in order to cut out the 5 faces.

TN Teacher has pupils draw lines on the grid paper in order to cut out 5 faces.

6 Cut out faces and make a box without a top.

P Cut the grid paper along the lines and make a box using sticky tape.

CONCLUSION

7 Summary.

T/P Summarise the lesson by confirming pupils' understanding of the main ideas in the lesson.

Sample Blackboard Plan

Date: **Chapter 17**: Shapes of Boxes **Sub-chapter:** Make a Nice Box **Lesson Number:** 6 of 6

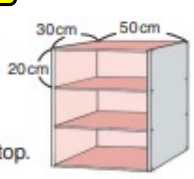
Main Task: Let's make a box without a top.

Review

- How many balls of clay is needed to make a box?

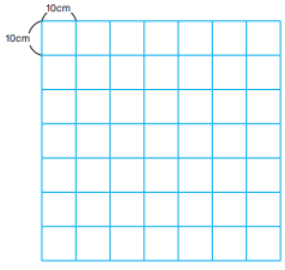
Activities

6 There is a chest drawer as shown on the right. Let's think of drawers that will fit in the slots without a top.





How can you cut all the faces needed to make the drawer from the thick paper below? Let's draw the faces that you want to cut out.



Summary

- **We can make a box without a top by cutting the 5 faces from the grid paper.**

Unit 17

Unit: Shapes of Boxes
Problems
Lesson 1 of 1

Textbook Page : p.210
Actual Lesson 162

Lesson Objectives

- To review what have been learnt.

Prior Knowledge

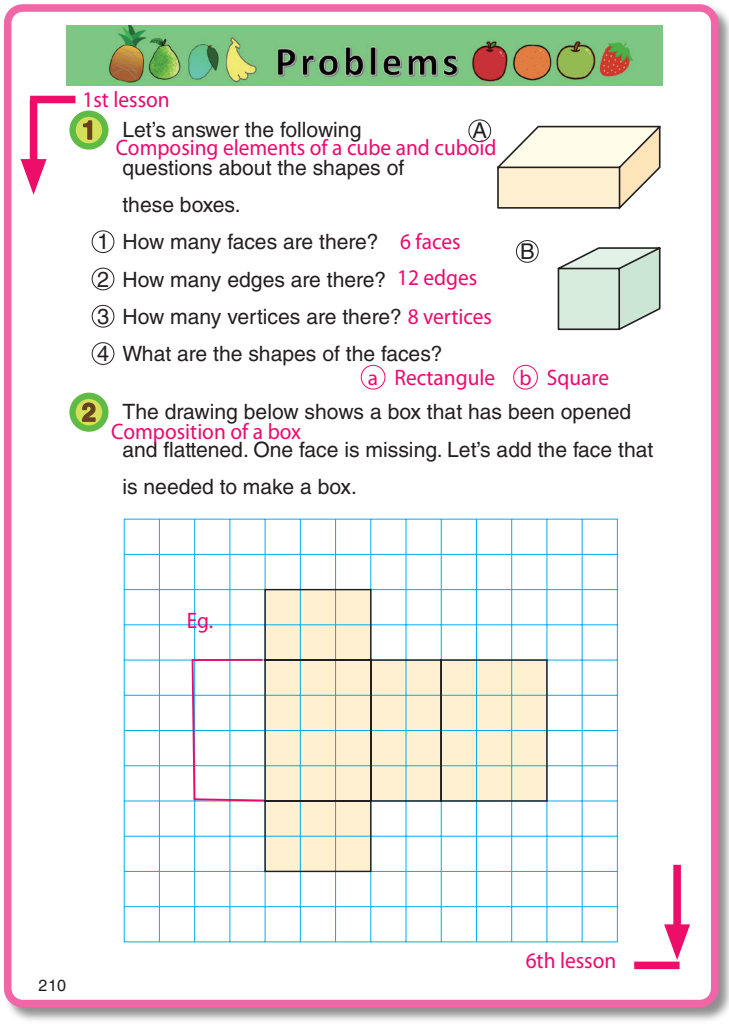
- All the contents in this unit (17).

Preparation

- Cuboids, cubes and grid papers.

Assessment

- To review what has been learnt in the unit. S



Teacher's Notes

Development Diagram and Preparatory Instruction

Drawing development diagrams and making cubes and rectangles are the contents to be taught to pupils of the upper grade. Thus, in this lesson, pupils only learn about tracing faces, adding a face to an unfinished development diagram.

Through activities such as tracing faces, folding faces, and comparing with original boxes, pupils better understand that the shapes of boxes are composed of flat shapes of squares and rectangles, and notice the shapes and the size of faces that are facing each other as well as its relationships with other parts of boxes. It could be challenging for some pupils to fold traced faces to make a box, it is ideal for Teacher to take enough time to allow pupils to think and better understand the characteristics of the shapes of boxes.

Development Diagram of a Cuboid

A cuboid has 54 ways of figures that are opened up. This lesson does not aim to understand many possible ways of doing so. Instead, this lesson aims for pupils to understand that there are many combinations of arranging faces to make a box.

Lesson Flow

PROBLEMS

1 To review the composing elements of the shapes of boxes.

T "Let's answer the following questions about the shapes of these boxes."

P Answer ①-④

TN Depending on the pupils' level of comprehension, Teacher ask pupils to utilise boxes that they made to better understand the shapes of boxes.

2 To add a face to an unfinished development diagram to make a box.

T Let the pupils to discover that a box has been opened and flattened however one face is missing.

P Add the face to the unfinished development diagram to make a box.

TN It is ideal that Teacher lets pupils think first. For those who have difficulties, the teacher can teach pupils by showing the development diagram of the box and folding it.

P Take note of the possible ways of adding a face to make a box through discussion.

Sample Blackboard Plan

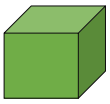
Date: **Chapter 17**: Shapes of Boxes **Sub-chapter:** Problems **Lesson Number:** 1 of 1

Problem

1

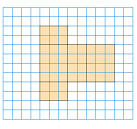


Faces = 6 faces
Edges = 12
Vertices = 8

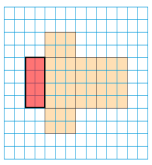


Faces = 6 faces
Edges = 12
Vertices = 8

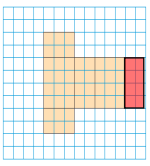
2 Let's add a face that is needed to make a box



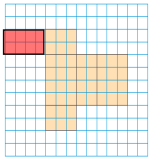
(a)



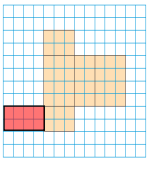
(b)



(c)



(d)



** Note: above a few solution to* 2

End of Chapter Test: Chapter 17 **Date:**

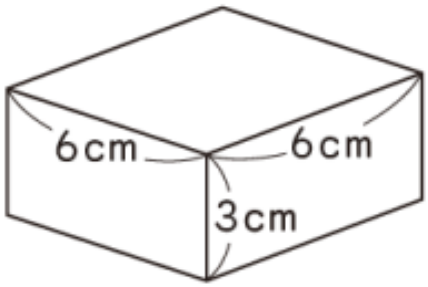
Evaluation: Chapter 17 Shapes of Boxes	Name:	Score /100

[20 points for each question]

1. How many of the following are there in the box below?

(1) Rectangular faces _____

(2) Square faces _____

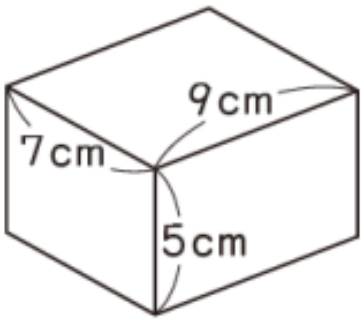


2. Regarding the box on the right, answer the following questions.

(1) How many edges are there ? _____

(2) How many 7 cm edges are there ? _____

(3) How many vertices are there? _____



Chapter 18 Summary of the Grade 2

1. Unit Objectives

To review what pupils have learnt during the grade 2

- To review the composition of 4 digit numbers, the size of numbers, addition and subtraction.
- To review multiplication through problem-making activity
- To review the relations of units in length and amount
- To review the shape of figures

This chapter is a summary of all the contents from Grade 2.
It is important for the students to acquire a procedural fluency in mathematics. That is not just understanding facts or procedures but using various procedures depending on the situation.
Various problems learned in Grade 2 are included in this chapter, so please give sufficient time to students to solve all the problems.











Fractions

Time and Duration

Numbers up to 1000

Tables and Graphs

Thinking about How to Calculate

Numbers up to 10000

Subtraction in Vertical Form



Addition in Vertical Form



Large Numbers

Unit 18

Unit: Summary of the Grade 2

Lesson 1 of 4

Textbook Page : p.211
Actual Lesson 163

Lesson Objectives

- To review the composition of numbers from 1 to 4 digit, and the size of numbers.
- To calculate according to the rules and the patterns identified.

Prior Knowledge

- Composition 4-digit numbers to understand the size of number for numbers larger than 100 and up to 1000
- Addition of 2 and 3-digit numbers.

Preparation

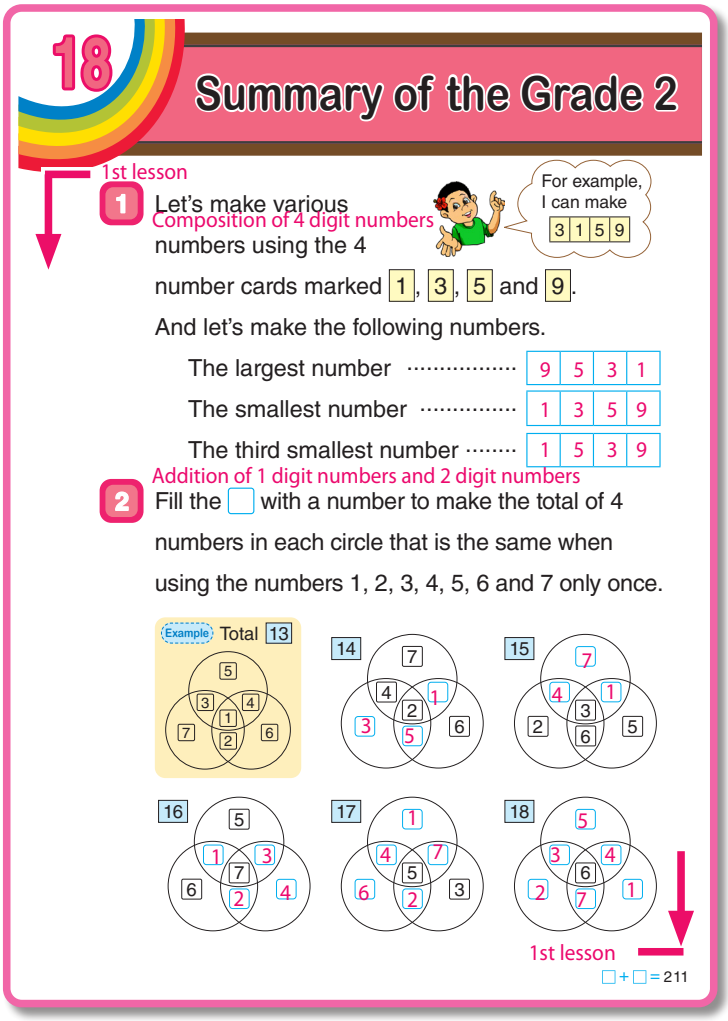
- Cards of numbers, display chart with the venn-diagram with blank squares for placing number cards.

Assessment

- Make composition of numbers from 1 to 4 digit, and the size of numbers. S
- Calculate according to the rules and the patterns identified. S

Teacher's Notes

Teaching tips: Game of 4-Digit Numbers
Two pupils with 4 cards of 1, 3, 6, and 8 each lay their cards face down.
Let's find which 4-digit numbers are bigger than the other. If they turn up the cards from bigger digit (left side), they can soon find who wins. However, if they turn up the cards from the 1st digit, then they get the numbers like below. It is not sure yet who will win.
□ □ □ 8, □ □ □ 1
For tens place digit, it is not yet sure who will win.
□ □ 1 8, □ □ 6 1
Thus, the result of the game depends on the number of hundreds place digit.
Through a game like above, pupils can understand the structure in the decimal positional numeration system.



Lesson Flow

1 Lead-up: Game of 4-digit number.

P Play the game of making 4-digit numbers using number cards 1, 3, 6, and 8

TN Read the tips for teaching the game of making 4-digit number in the teachers note to become familiar with it.

T Get the students to say the 4-digit number as: one thousand, three hundred, thirty-eight and not as one, three, six, eight

2 Introduce summary task 1.

T Let's make 4-digit numbers and compare their sizes.

T/P Read and understand the task.

P Make various 4-digit numbers with number cards 1, 3, 5 and 9 and compare the size numbers with other pupils.

T Ask pupils to say the 4-digit number by its' place value and get them to identify the biggest and smallest 4-digit number.

P Find the biggest or the smallest number from the 4 digit numbers and share the reasons for their choice.

P Find the third smallest number and explain the reasons

TN Guide the pupils to find the third smallest number by helping them arranging the various 4 digit numbers in-order from highest to the lowest

T Ask; (1) what is the largest number? (2) what is the smallest number? (3) What is the third smallest number?

3 Introduce summary task 2.

T/P read the instructions for task 2

T/P Arrange the number cards 1, 2, 3, 4, 5, 6 and 7 on the display chart to show the sum in the example

T/P Put some of the seven number cards on the empty squares ☐ to make the sum of 14 as practice to understand the point of the question of the task.

TN Helps pupils identify the pattern by adding the 3 known numbers and subtracting from then it from the given sum in-order to find the unknown number. Example;

P Continue putting some of the number cards on empty squares ☐ to make the sum of 15, 16, 17, and 18.

T Check and confirm their work and have them write it into their notebook before proceeding to finding the next sum.

4 Summary.

T/P Summarise the lesson by confirming pupils' understanding of the main ideas in this lesson.

Sample Blackboard Plan

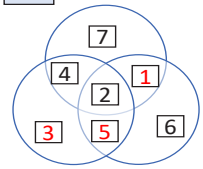
Date: **Chapter 18**: Summary of the Grade 2 **Lesson** 1 of 4

1 Let's make the following numbers

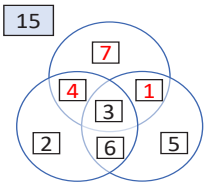
Largest number	9	5	3	1
Smallest number	1	3	5	9
Third smallest number	1	5	3	9

2 Let's make the total of 4 numbers in each circles

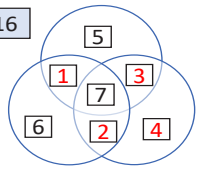
Total 14



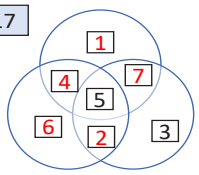
Total 15



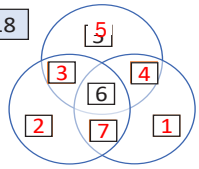
Total 16



Total 17



Total 18



Unit 18

Unit: Summary of the Grade 2

Lesson 2 of 4

Textbook Page : p.212
Actual Lesson 164

Lesson Objectives

- To calculate according to the rules and patterns identified.
- To think of multiplication that has answers with different numbers.

Prior Knowledge

- Additions and Subtraction of (2-digit)-(2-digit) numbers and (2-digit)-(1-digit) numbers
- Multiplication of 2, 3, 4, 5, 6, 7 and 9

Preparation

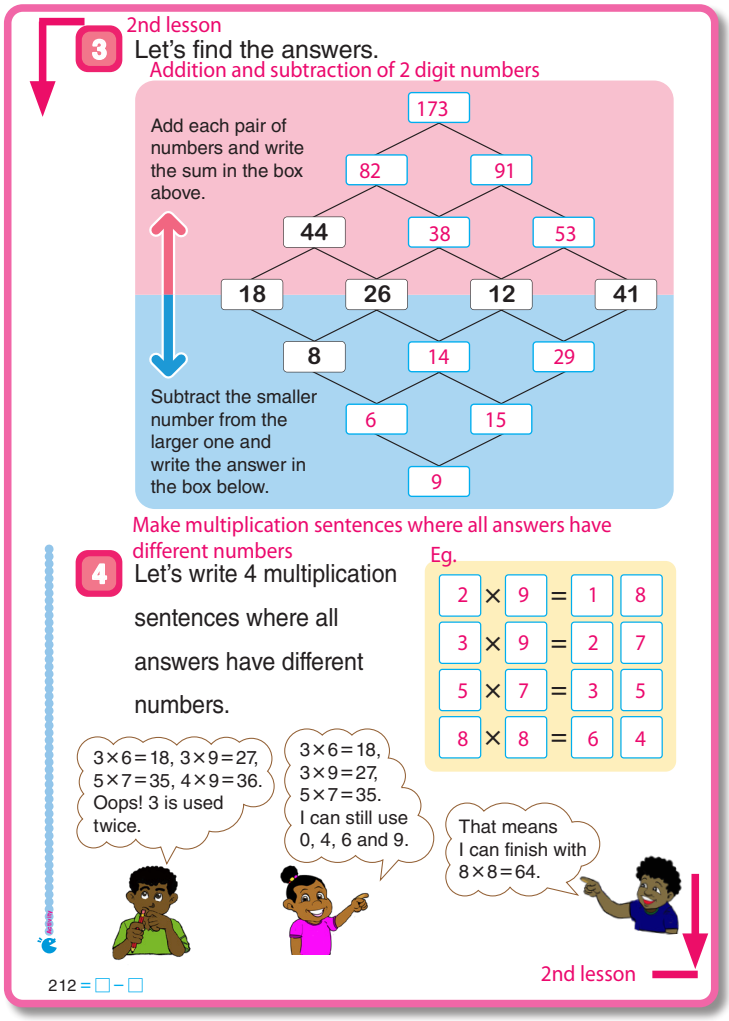
- Display chart.

Assessment

- Calculate according to the rules and patterns in additions and subtraction of 2-digit numbers. S
- Write out multiplication sentences that has answers with different numbers. S

Teacher's Notes

Supplementary Exercise
With 4 cards of 0, 2, 5, and 9, make various numbers. Then, make the following numbers
① The biggest number
② The 2nd biggest number
③ The smallest number
④ The 2nd smallest number
Answers;
① 9620 ② 9502 ③ 2059 ④ 2095



Lesson Flow

1 Introduce summary task 3.

T/P Read and understand summary task.

T Let's find the answers

P Do addition and subtraction according to rules.

P Identify and understand the rules and the patterns through the examples.

P Calculate by following such rules and find the answers for the top and the bottom of the diagram.

TN Teacher makes sure that pupils can do all the calculations: addition of each pair of 2-digit numbers with carrying, subtraction of a 2-digit number from a 2-digit number, and subtraction of a 1-digit number from a 2-digit number.

P Change the 4 numbers in the middle of the diagram, and calculate to have answers of the top and the bottom.

2 Introduce task 4.

T Let's write multiplication sentences where all answers have different answers

P Think of the rules of multiplication, then find 4 multiplication sentences that have answers with different numbers.

P Put one number in one empty square ☐, and understand that all the answers are 2-digit numbers.

P think of multiplication sentences whose answers are 2-digit numbers, and find if each number used in answer square ☐ is overlapping each other.

P Combine 2 numbers that they have not yet used in other mathematics sentences, and make 2 digit numbers of answers that they can find in the multiplication table.

P Explain what they understand that is there are only one multiplication sentence (7×7) that has an answer using 9, and two sentences (3×9 and 8×9 vice versa) that have answers using 7.

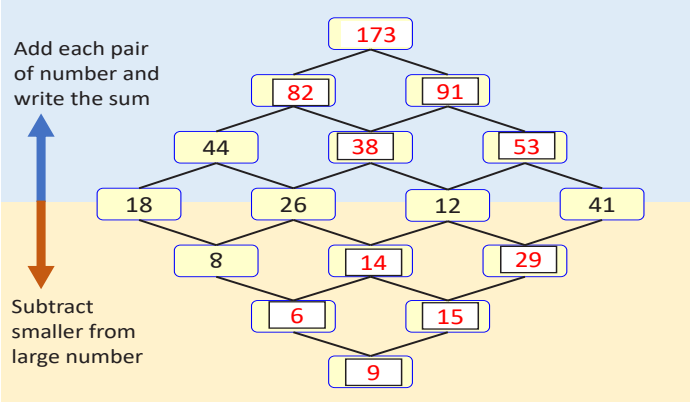
3 Summary.

T/P Summarise the lesson by confirming pupils' understanding of the main ideas in the lesson.

Sample Blackboard Plan

Date: Chapter Name: Summary Sub-Chapter/Topic: Review Lesson number 2 of 4

3 Let's find answers



4 Let's write 4 multiplication sentences

2 X 9 = 18
3 X 9 = 27
5 X 7 = 35
8 X 8 = 64

Unit 18

Unit: Summary of the Grade 2

Lesson 3 of 4

Textbook Page : p.213
Actual Lesson 165

Lesson Objectives

- To review the meaning of multiplication through problem-making activity.

Prior Knowledge

- Write and read math expressions of multiplication.

Preparation

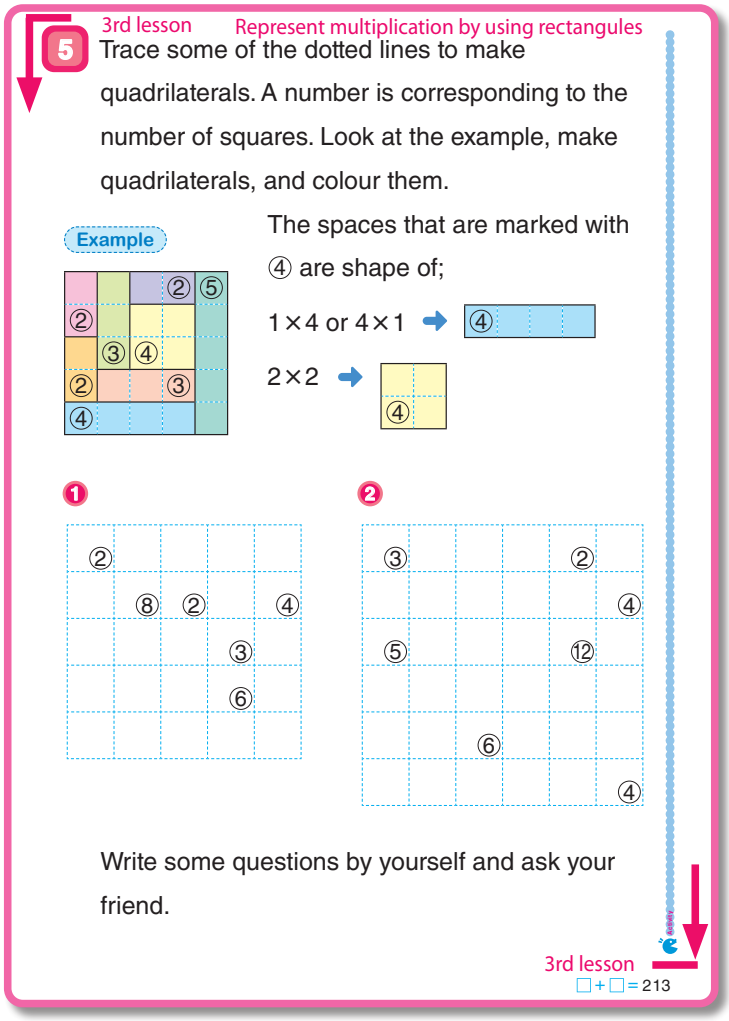
- Textbook page.

Assessment

- Represent multiplication by using rectangles. S

Teacher's Notes

Pupils will solve problems based on the knowledge learnt from the units of Multiplication and drawing rectangles and squares.



3rd lesson Represent multiplication by using rectangles

5 Trace some of the dotted lines to make quadrilaterals. A number is corresponding to the number of squares. Look at the example, make quadrilaterals, and colour them.

Example

The spaces that are marked with ④ are shape of;

1×4 or 4×1 ➜ ④

2×2 ➜ ④

1

2

Write some questions by yourself and ask your friend.

3rd lesson
□+□=213

Lesson Flow

1 Introduce summary task 5.

T/P Read and understand the situation on multiplication sentences

P Express multiplication sentences by making rectangles.

P Understand the meaning of the problem through the instruction and the example.

2 Problems ① and ②.

T Explain to pupils how they will solve the problems.

P Work on the problems ① and ②.

T/P Do the corrections

T Tell pupils to develop similar problems by themselves or with a friend.

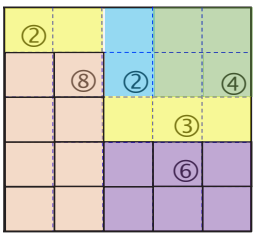
P Develop similar problems by themselves and work on them with other pupils.

Sample Blackboard Plan

Date: Chapter Name: Summary Sub-Chapter/Topic: Review Lesson number 3 of 4

5 Let's connect the dots to make quadrilaterals

1



Spaces marked with

② 2 × 1
1 × 2

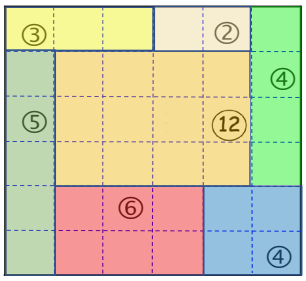
③ 3 × 1
1 × 3

④ 2 × 2
4 × 1

⑥ 3 × 2
2 × 3
6 × 1

⑧ 2 × 4
4 × 2
8 × 1

2



Spaces marked with

② 2 × 1
1 × 2

③ 3 × 1
1 × 3

④ 2 × 2

④ 4 × 1

⑤ 5 × 1

⑥ 3 × 2
2 × 3
6 × 1

⑫ 4 × 3
3 × 4

Unit 18

Unit: Summary of the Grade 2

Lesson 4 of 4

Textbook Page : p.214
Actual Lesson 166

Lesson Objectives

- To draw triangles and quadrilaterals by connecting dots.

Prior Knowledge

- Trace dotted lines to make rectangles that correspond to multiplication sentences
- Chapter 10 to 13 on Multiplication.
- Measurement of amounts.

Preparation

- Ruler.

Assessment

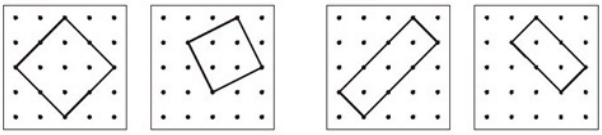
- Draw triangles and quadrilaterals by connecting dots with straight lines. S
- Represents measurement of lengths and amounts correctly. S

Teacher's Notes

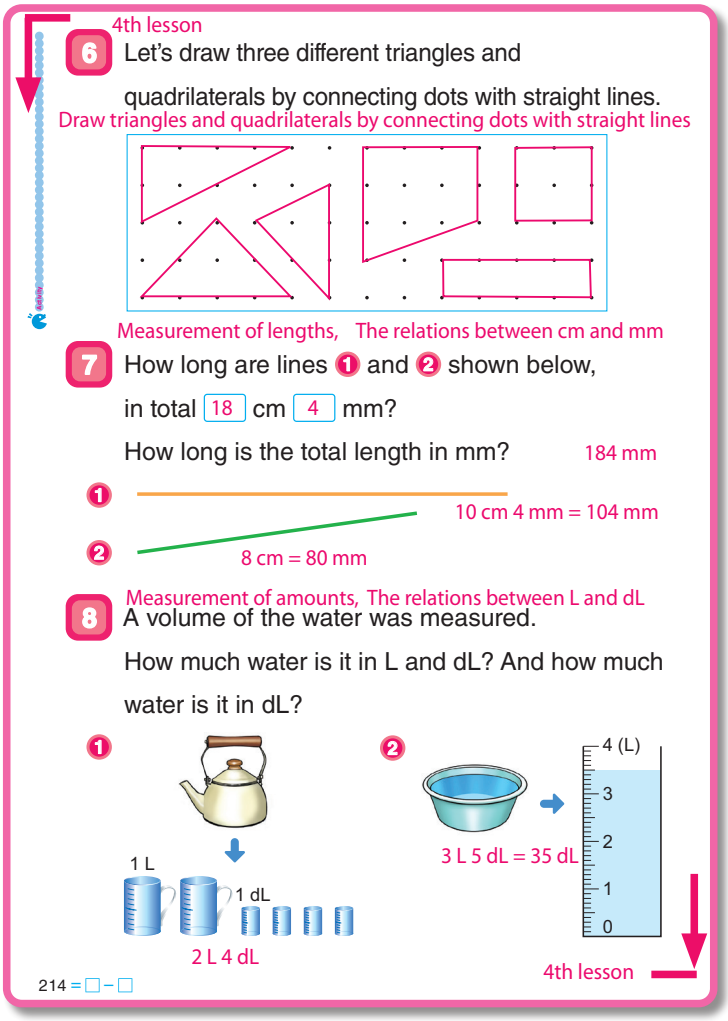
Connecting Dots

In this lesson, pupils can draw lines by connecting dots to make triangles and quadrilaterals.

Here are some examples.



They will also apply their knowledge of the relations of cm and mm to represent length and relations of L and dL to represent amounts of liquid.



Lesson Flow

1 Introduce summary task 6.

T/P Read and understand the situation on multiplication sentences

P Recall what kind of shapes are triangles and quadrilaterals.

TN Get pupils describe that the shapes are surrounded by straight lines and the vertices are all connecting each other.

2 Draw various triangles and quadrilaterals.

P Pupils draw various triangles and quadrilaterals by connecting dots.

TN Teacher has pupils review their drawing by making sure if all the lines are straight, and the vertices are well connected.

T/P Allow pupils to describe their triangles and quadrilaterals freely.

3 Introduce summary task 7.

T/P Read and understand the situation on measurement of length.

P Read and write measurement of lengths and explain the relations of cm and mm.

T/P Confirm and correct the answers.

4 Introduce summary task 8.

T/P Read and understand the situation on measurement of amounts.

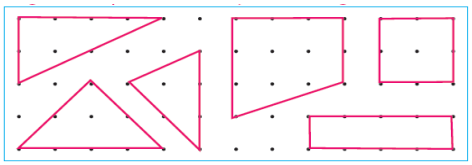
P Read and write measurement of amounts and explain the relations of Litres and dL.

T/P Confirm and correct the answers.

Sample Blackboard Plan

Date: Chapter Name: Summary Sub-Chapter/Topic: Review Lesson number 4 of 4

6 Let's connect the dots to make quadrilaterals



7 How long are lines ① and ②?

① 10 cm 4 mm = 104 mm

② 8 cm = 80 mm

Total length: 18 cm 4 mm

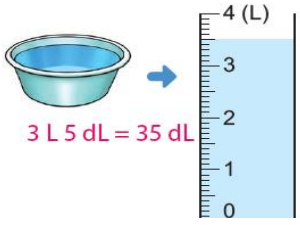
Total length in mm: 18 cm .....180 mm

180 mm + 4 mm

8 How much water in L and dL and how much in dL?

① 

2 L 4 dL

② 

3 L 5 dL = 35 dL

Answers for the End of Unit Test

Unit 1 - Unit 4

Evaluation: Chapter 1 Numbers up to 1000	Name:	Score /100

[10 points for each question]

1. Find the answers.

(1) What number is in the hundreds place in 350? 3

(2) What number is in the tens place in 640? 4

(3) How many tens are needed to make 260? 26 tens

2. Please write the numbers in numeral.

(1) Three hundred forty two 342

(2) Six hundred and five 605

3. Fill in the blank.

(1) 700 − 800 − 900 − 1000

(2) 401 − 400 − 399 − 398

4. Let's calculate.

(1) 30 + 70 = 100 (2) 150 − 60 = 90 (3) 200 + 400 = 600

Evaluation: Chapter 2 Thinking about How to Calculate	Name:	Score /100

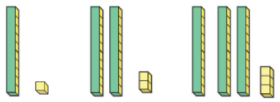
[10 points for each blank]

1. Fill in the blank.

David has 11 cookies, and Ana has 22 cookies. How may cookies are there altogether?

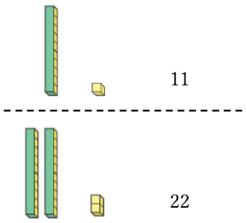
(1) Michelle's idea

11 + 22



3 sets of 10 and 3 ones blocks makes 33. 11 + 22 = 33

(2) Bob's idea



It is easier to count if you place the blocks vertical to each other.

3 sets of 10 and 3 single blocks makes 33.

11+22= 33

Evaluation: Chapter 3 Time and Duration	Name:	Score /100

[10 points for each question]

1. What time is it?

(1) 6 : 58



(2) 7 : 10



(3) 2 : 44



2. Fill in the blank.

(1) 1 hour 5 minutes = 65 minutes.

(2) 65 minutes = 1 hours 5 minutes.

(3) 1 hour 30 minutes = 90 minutes

3. Answer the following questions. What is the ;

(1) time 4 hours after 5:00 AM. 9:00 AM

(2) time 3 hours before 6:00 PM. 3:00 AM

(3) duration from 7:00 PM to 11:00 PM. 4 hours

Evaluation: Chapter 4 Addition in Vertical Form	Name:	Score /100

1. Let's find the answers using vertical form. [10 points for each question]

(1) 41 + 35

$$\begin{array}{r} 41 \\ +\ 35 \\ \hline 76 \end{array}$$

(2) 34 + 3

$$\begin{array}{r} 34 \\ +\ 3 \\ \hline 37 \end{array}$$

(3) 27 + 65

$$\begin{array}{r} {\scriptstyle 1}\,27 \\ +\ 65 \\ \hline 92 \end{array}$$

(4) 48 + 32

$$\begin{array}{r} {\scriptstyle 1}\,48 \\ +\ 32 \\ \hline 80 \end{array}$$

(5) 57+84

$$\begin{array}{r} {\scriptstyle 1}\,57 \\ +\ 84 \\ \hline 141 \end{array}$$

(6) 300 + 400

$$\begin{array}{r} 300 \\ +\ 400 \\ \hline 700 \end{array}$$

(7) 443 + 38

$$\begin{array}{r} {\scriptstyle 1}\,443 \\ +\ 38 \\ \hline 481 \end{array}$$

(8) 379 + 248

$$\begin{array}{r} {\scriptstyle 1\ 1}\,379 \\ +\ 248 \\ \hline 627 \end{array}$$

2. Make a math sentence and find the answer.

[5 points for math sentence and 5 points for answer]

(1) There are 36 picture books and 29 reference books in a classroom. How many books are there altogether?

Math sentence 36 + 29 = 65 Answer 65 books

(2) Emily had 123 kina. Her mother gave her 149 kina. How many kina does she have now?

Math sentence 123 + 149 = 272 Answer 272 kina

Unit 5 - Unit 8

Evaluation: Chapter 5 Subtraction in Vertical Form	Name:	Score /100

1. Let's find the answers using vertical form. [10 points for each question]

(1) 38 − 15 → 38 - 15 = 23

(2) 26 − 3 → 26 - 3 = 23

(3) 65 − 17 → 65 - 17 = 48

(4) 30 − 13 → 30 - 13 = 17

(5) 145 − 127 → 145 - 127 = 18

(6) 207 − 139 → 207 - 139 = 68

(7) 236 − 38 → 236 - 38 = 98

(8) 224 − 149 → 224 + 149 = 75

2. Make a math sentence and find the answer.
[5 points for math sentence and 5 points for answer]

(1) There were 43 postage stamps. I used 28 of them. How many are left?

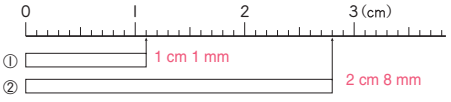
Math sentence 43 - 28 = 15 Answer 15 postage stamps

(2) The school shoes cost 65 kina and the school bag costs 124 kina. Which is more expensive, and by how much?

Math sentence 124 - 65 = 59 Answer School bag and by K59

Evaluation: Chapter 6 Lengths	Name:	Score /100

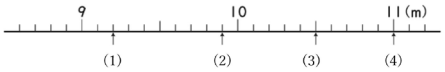
1. What are the lengths of the following lines? [10 points each for all correct answers]



① 1 cm 1 mm or 11 mm

② 2 cm 8 mm or 28 mm

2. Read the scale. [10 points each for all correct answers]



(1) 9 m 20 cm (2) 9 m 90 cm (3) 10 m 50 cm (4) 11 m

3. Calculate the length [10 points for each]

(1) 4 m 20 cm + 50 cm = 4 m 70 cm

(2) 5 m 30 cm − 80 cm = 5 m 50 cm

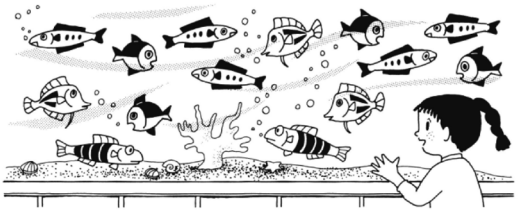
4. Make a math sentence and find the answer. [10 points for math sentence and 10 points for answer]

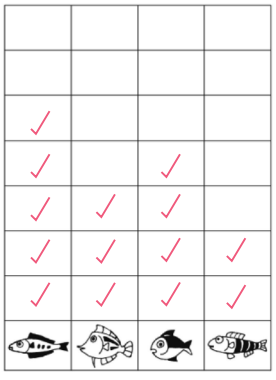
There is a string which is 10cm 3mm long. I used 7 cm. How many cm is left?

Math sentence 10 cm 3 mm - 7 cm = 3 cm 3 mm Answer 3 cm 3 mm

Evaluation: Chapter 7 Tables and Graphs	Name:	Score /100

1. Answer the following questions.





(1) Represent the number of each fish by using ✓ in the box.
[10 points for each fish]

[20 points for each question]

(2) How many  are there?

5

(3) How many  are there?

3

(4) How many more  are there than  ?

2 more

Evaluation: Chapter 8 Amount of Water	Name:	Score /100

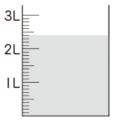
1. What is the volume of the water? [10 points each for all correct answers]

(1)

1 L 3 dL or 13 dL

(2) 

2 L 1 dL or 21 dL

(3) 

2 L 4 dL or 24 dL

2. Fill in the blank. [10 points each for all correct answers]

(1) 2 L = 20 dL (2) 37 dL = 3 L 7 dL (3) 3000 mL = 3 L

3. Calculate. [10 points for each question]

(1) 1 L 5 dL + 3 dL = 1 L 8 dL

(2) 3 L 4 dL − 1 L 2 dL = 2 L 2 dL

4. Make a math sentence and find the answer.
[10 points for math sentence and 10 points for answer]

There is 1 litre and 5 decilitres of lemon juice. The family drank 1 litre and 2 decilitres. How much is left?

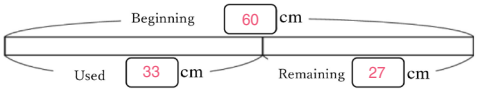
Math sentence 1 L 5 dL - 1 L 2 dL = 3 dL Answer 3 dL

Unit 9 - Unit 12

Evaluation: Chapter 9 Addition and Subtraction	Name:	Score /100

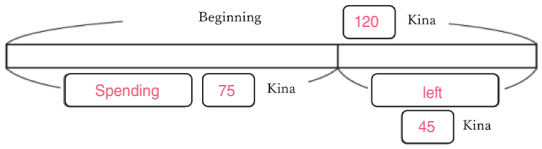
1. Fill in the box, make mathematical sentence and find the answer. [5 points for each]

(1) If you used 33 cm of tape and 27 cm remained, how many centimeters of tape were there to begin with?



Math sentence 33 + 27 = 60 Answer 60 cm

(2) Wesley had 120 kina. After spending some amount, he was left with 45 kina.
How much did he spend?



Math sentence 120 - 45 = 75 Answer 75 Kina (spent)

2. Fill in the box, make mathematical sentence and find the answer. [10 points for each]

(1) Skylar has 3 people behind her and 18 people in front of her. How many people are there in total?



Math sentence 18 + 1 + 3 =22 Answer 22 people

Evaluation: Chapter 10 Multiplication (1)	Name:	Score /100

[10 points for math sentence and 10 points for answer]

1. How many candies are there? Write the multiplication math sentence and answer it.

(1)



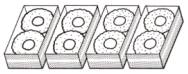
Math sentence: 3×2 = 6 Answer: 6 candies

(2)



Math sentence: 4×3 = 12 Answer: 12 candies

2. How many doughnuts are there? Write the multiplication math sentence and answer it.



Math sentence: 4×2 = 8 Answer: 8 doughnuts

3. There are 5 boats. Each can carry 2 people. How many people can be carried in total?

Math sentence: 5×2 = 10 Answer: 10 people

4. There are 4 tapes, each is 3 cm long. How long will the total length be?

Math sentence: 4×3 = 12 Answer: 12 cm

Evaluation: Chapter 11 Multiplication (2)	Name:	Score /100

1. Do multiplications. [5 points for each question]

(1) 4×5= 20 (2) 2×7= 14 (3) 5×6= 30 (4) 3×1= 3

(5) 5×2= 10 (6) 4×8= 32 (7) 2×9= 18 (8) 3×8= 24

[10 points for math sentence and 10 points for answer]

2. Each bag contains 3 apples, how many apples are there in 4 bags?

Math sentence: 3×4 = 12 Answer: 12 apples

3. There are 7 tapes. Each tape is 5 cm long, how long will the tape be if all of them are connected?

Math sentence: 5×7 = 35 Answer: 35 cm

4. 4 eggs make up one pack, how many eggs are there in 9 packs? Math sentence

Math sentence: 4×9 = 36 Answer: 36 eggs

Evaluation: Chapter 12 Multiplication (3)	Name:	Score /100

1. Do multiplications. [5 points for each question]

(1) 8×5= 40 (2) 1×6= 6 (3) 8×6= 48 (4) 9×7= 63

(5) 6×5= 30 (6) 7×8= 56 (7) 6×9= 54 (8) 7×2= 14

[10 points for math sentence and 10 points for answer]

2. You give 6 pens to 8 people. How many pens are needed in total?

Math sentence: 6×8 = 48 Answer: 48 pens

3. One team consists of 7 players playing rugby. How many players are there in 8 teams?

Math sentence: 7×8 = 56 Answer: 56 players

4. There are 4 bags of candies. Each bag contains 8 candies. How many candies are there in total?

Math sentence: 8×4 = 32 Answer: 32 candies

Unit 13 - Unit 16

Evaluation: **Chapter 13** **Multiplication (4)**	Name:	Score /100

1. Fill in the blanks. [10 points for each blank]

(1) For the answer of the multiplication of 5, the number 0 and 5 appear in ones place.

(2) If you add 4 to the answer of 4×2, it becomes the answer to 4× 3 .

2. Fill in the blanks. [10 points for each question]

(1) 5×6= 6 × 5 (2) 8× 9 =9×8

(3) 8 × 7 = 7 × 8 (4) 4 × 8 = 8 × 4

[5 points for each]

3. Write the multiplication that results in the following numbers.

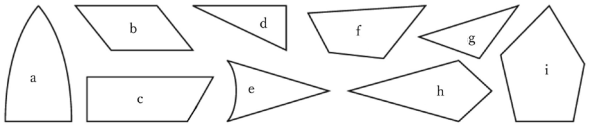
(1) 16 1×16 , 2×8 , 4×4

(2) 18 1×18 , 2×9 , 3×6

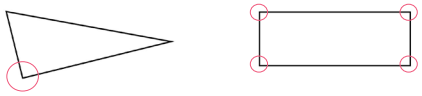
Evaluation: **Chapter 14** Triangles and Quadrilaterals	Name:	Score /100

1. Classify them into triangles, quadrilaterals, and others. [10 points for each]

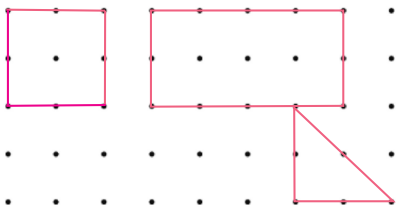
Triangles d, g Quadrilaterals d, g, c, h Others a, e, i



2. For the triangles and quadrilaterals below, circle the place of right angles. [5 points for each]



3. Connect the dots to draw rectangles, squares, and right triangles. [20 points for each]



Evaluation: **Chapter 15** **Large Numbers**	Name:	Score /100

[10 points for each question]

1. Write the following sets of numbers in numerals.

(1) A number contains 5 sets of 1000, 3 sets of 100, 9 sets of 10, and 1 set of 1.

5391

(2) A number contains 10 sets of 1000.

10000

(3) A number contains 65 sets of 100.

6500

2. Which number is larger? Show it by using > or <.

(1) 9329 < 9351 (2) 5232 < 5322 (3) 8045 < 8054

3. Write in numerals

(1) Three thousand seven hundred and forty-five 3745

(2) Six thousand and twenty-eight 6028

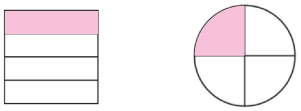
(3) Five thousand and one 5001

(4) Six thousand 6000

Evaluation: **Chapter 16** Triangles and Quadrilaterals Fractions	Name:	Score /100

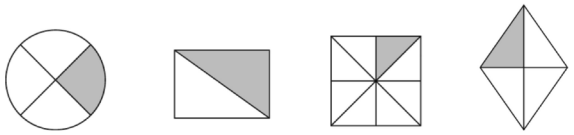
1. Shade a quarter of the original size. [10 points for each question]

(1) (2)



2. What fraction of the whole is the coloured area? [10 points for each question]

(1) (2) (3) (4)



$\frac{1}{4}$ $\frac{1}{2}$ $\frac{1}{8}$ $\frac{1}{4}$

3. Let's divide into quarter two different ways? [20 points for each question]

Way 1 Way2



Unit 17

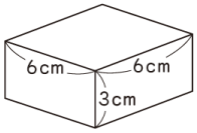
Evaluation: **Chapter 17** Shapes of Boxes	Name:	Score /100

[20 points for each question]

1. How many of the following are there in the box below?

(1) Rectangular faces 4

(2) Square faces 2

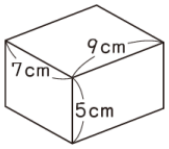


2. Regarding the box on the right, answer the following questions.

(1) How many edges are there ? 12

(2) How many 7 cm edges are there ? 4

(3) How many vertices are there? 8



Structure of learning contents in Mathematics from Elementary Prep to Grade 8

Number and Operation

Elementary Prep – Elementary 2

Elementary Prep

- Natural numbers up to 120

- Natural numbers up to 120
- Additions and subtraction of one-digit numbers
- Additions and subtractions of simple 2-digit numbers

Elementary 1

- Natural numbers up to 1000

- Simple fractions

- Additions and subtractions of 2-digit numbers
- Additions and subtractions of simple 3-digit numbers

Elementary 2

- Natural numbers up to 10000

- Meaning of multiplication
- Multiplication table
- Multiplication of simple 2-digit numbers

Grade 3 – Grade 4

Grade 3

- Natural numbers less than 100 000
- Addition and subtraction of natural numbers (with carrying & borrowing)
- Multiplication of natural numbers
- Meaning of division
- Division in the simple case where divisors are 1-digit numbers

- The meaning and the representations of decimal numbers
- Addition and subtraction of decimal numbers (the tenths place)
- The meaning and the representation of fractions
- Simple addition and subtraction of fractions with same denominator less than 1

Grade 4

- Natural numbers less than billion
- Round numbers, round up and round down
- Division in the case where divisors are 2-digit numbers
- Acquisition and utilization of 4 operations of natural numbers

- Addition and subtraction of decimal numbers (the tenths and the hundredths places)
- Multiplication and division of decimals by whole numbers
- Addition and subtraction of fractions with same denominators (proper fraction, mixed numbers)

Grade 5 – Grade 6

Grade 5

- Even and odd numbers, prime numbers, multiples and whole numbers

- Multiplications and divisions by decimal (tenths and hundredths pace, etc)
- Addition and subtraction of fractions with different denominators

Grade 6

- Multiplication and division of fractions
- Calculations that involve both fractions and decimals
- Consolidation and utilization of the 4 basic operations of decimals and

Grade 7 – Grade 8

Grade 7

Positive numbers, negative numbers

- Necessity and meaning of positive and negative numbers (set of numbers and the 4 fundamental operations)
- Four basic operations with positive and negative numbers

Algebraic expressions using letters

- Necessity and meaning of using letter
- How to express multiplication and division
- Additional and subtraction with linear expressions
- Representing with algebraic expressions with letters (representations in inequality)

Linear equations with one unknown

- Meaning of equations and their solutions
- Property of equality and how to solve equations
- Solving and using linear equations (proportional expressions)

Grade 8

Calculations of 4 basic operations with expressions using letters

- Calculations of addition and subtractions with simple polynomials, as well as multiplication and division with monomials

Simultaneous linear equations with unknowns

- Necessity and meaning of simultaneous linear equations with two unknowns and the meaning of their solutions
- Meaning of simultaneous equations and their solutions
- Solving simultaneous equations and applying them

Quantities and Measurements

Elementary Prep – Elementary 2	Grade 3 – Grade 4	Grade 5 – Grade 6	Grade 7 – Grade 8
Elementary Prep • Comparing amount of length, area, volume (arbitrary) • Telling clock times (O'clock)	**Grade 3** • Unit of length (km) • Unit of weight (g, kg, t) • Calculations with time	**Grade 5** • Area of triangles, rectangles, parallelograms, trapeziums and rhombi • Unit of volume (cubic cm, cubic m, mL, kL) • Volumes of cuboids and cubes • Mean of measurements • Per unit quantity	**Grade 7** • Volume cylinders
Elementary 1 • Unit of length (cm, mm, m) • Reading times • Additions and subtractions of 2-digit numbers • Additions and subtractions of simple 3-digit numbers	**Grade 4** • Unit of area (square cm, square m, square km, a, ha) • Finding area of rectangle and square • Unit of angle (degree)	**Grade 6** • Area of approximate shape • Area of circle • Volume of prisms • Metric system • Speed	
Elementary 2 • Unit of volume (L, dL, mL) • Unit of time (day, hour, minute, second)			

Geometrical figure

Elementary Prep – Elementary 2	Grade 3 – Grade 4	Grade 5 – Grade 6	Grade 7 – Grade 8
Elementary Prep • Observing and composing the shapes of planer figures and solid figures	**Grade 3** • Isosceles triangle, equilateral triangles • Angle	**Grade 5** • Polygons and regular polygons (irregular polygons) • Congruence of triangles and quadrilaterals • Circular constant • Prism, cylinders, sketches, nets	**Grade 7** Plane figures • Fundamental methods for constructing of figures and their applications • Moving figures (parallel translation, symmetric transformation, rotation) Space figures • Positional relationship between straight lines and planes • Structure of space figures and their representation on the plane (sketches, nets, projection drawings) • Length of arc of a sector and area of the sector • Surface area and volume of prisms, cones and spheres
Elementary 1 • Triangles, quadrilaterals, rectangles, squares, right triangles • Shape of a box	**Grade 4** • Perpendicular and parallel • Parallelogram, rhombus, trapezium • Cube, cuboid		
Elementary 2 • Circle, sphere		**Grade 6** • Line symmetry, point symmetry • Enlarged and reduced figures	**Grade 8** Basic plane figures and properties of parallel lines • Properties of parallel lines and angles • Properties of angles of polygons Congruence of plane figures • Congruence of plane figures and conditions of congruence of triangles • Necessity, meaning and methods of proof • Basic properties of triangles and parallelograms

Mathematical Relations

Elementary Prep – Elementary 2	Grade 3 – Grade 4	Grade 5 – Grade 6	Grade 7 – Grade 8
Elementary Prep • Representing the number of objects using pictures and figures	**Grade 3** • Representing the situations where divisions are used by algebraic expressions • Making connections between algebraic expressions and diagrams, Algebraic expressions that use empty boxes • Tables and graphs (Bar + Columns) in numerical representation	**Grade 5** • Simple proportional relations • Relations of two quantities that are expressed by simple algebraic relations • Percentage, pie charts	**Grade 7** Direct proportion and Inverse proportion • Meaning of functional relationship • Application of direct proportion and inverse proportion Dispersion of data and representative value of data • Necessity and meaning of histogram and representative values • Applying histogram and representative values
Elementary 1 • Relationship between addition and subtraction • Basic table and graphs	**Grade 4** • Algebraic expressions that contain some of the 4 basic operations and expressions with brackets and formulas • Expression with empty boxes and empty triangles • Relationship between two number/quantities as they vary simultaneously • Points, broken line graphs	**Grade 6** • Algebraic expressions using letters such as x or a • Proportional relationship • Proportion and inverse proportion • The average of data, frequency distribution, histgram	**Grade 8** Linear functions • Phenomena and linear functions • Tables, algebraic expressions and graphs of linear functions • Linear equations with two unknowns and functions • Using linear functions Probability • Necessary and meaning of probability and finding the probability
Elementary 2 • Representing situations where multiplication is used • Tables and bar graphs in pictorial/ symbols			

Mathematics Grade 2 Teacher's Manual Development Committee

The Mathematics Teacher's Manual was produced under the Department of Education and Gakkotosho Joint Project for the development of Mathematics teaching materials. The teacher's manual was developed by Curriculum Development Division (CDD) under Department of Education in partnership with Global Partnership for Education (GPE) - Save the Children as Grant Agent through the Program for Boosting Education Standards Together in PNG (BEST PNG Program). The following stakeholders have contributed to develop, manage, write, validate and make quality assurance for development and quality of the Textbook and Teacher's Manual for the students and teachers of Papua New Guinea.

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