Technology and Industrial Arts

Textile Technology

Senior High

Grade 11

Teacher Guide

Standards-Based

Department of Education

'FREE ISSUE
NOT FOR SALE'

Technology and Industrial Arts

Textile Technology

Grade 11

Teacher Guide

Standard Based Curriculum

Department of Education

Issued free to schools by the Department of Education

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Contents

Acronyms

AAL	Assessment As Learning
AFL	Assessment For Learning
AOL	Assessment Of Learning
ARS	Audience Response System.
BoS	Board of Studies
CDD	Curriculum Development Division
CP	Curriculum Panel
DA	Diagnostic Assessment
IHD	Integral Human Development
GoPNG	Government of Papua New Guinea
KSVA	Knowledge Skills Values and Attitudes
MTDG	Medium Term Development Goals
NDoE	National Department of Education
OBC	Outcomes-Based Curriculum
OBE	Outcomes-Based Education
PNG	Papua New Guinea
SAC	Subject Advisory Committee
SBA	Standards-Based Assessment
SBC	Standards-Based Curriculum
SBE	Standards-Based Education
SCG	Subject Curriculum Group
STEAM	Science, Technology, Engineering, Arts and Mathematics
SRS	Student Response System
TIA	Technology and Industrial Arts
UOW	Unit of Work

SECRETARY'S MESSAGE

The ultimate aim of Standards-Based Education in Papua New Guinea (PNG) is to prepare students for careers, higher education, and citizenship. This means that education should focus on developing and equipping students with essential k nowledge, skills, values, and attitudes that they can use in all aspects of their lives. Education must also aim to motivate and prepare students to pursue Science, Technology, Engineering, Arts, and Mathematics (STEAM) courses in higher education institutions and pursue careers in STEAM related fields.

The Technology and Industrial Arts subject has 5 strands, which have their own teacher guides developed. This Textiles Technology teacher guide is one of the four developed for grades 9 to 12. Textiles Technology is a significant curriculum course written to develop skills-based proficiencies and competencies in students to be confident, efficient and effective creators and users of textile through better understanding of the content and incorporating the concepts with other technologies, that will provide career opportunities for students to pursue in the 21st century.

Textiles Technology embraces the historical and cultural diversity of creating various types of fibres and fabrics, textiles and clothing, absorbing key important aspects of safety, blending these into the modern designing and constructions of garments and fashions and other textile products to meet the needs of today's living.

It is equally important for students to understand textile technology on a larger scale, the perspectives of textile products manufacturing industries, and their impacts on the environment as well as the population globally. Students will make decisive and collaborative decisions to further pursue textile technology more to their advantage and interest.
Technology and Industrial Arts as a subject of which Textile Technology is a strand, is envisioned to benefit students in enabling them to utilise textile technology knowledge, skills, values and attitudes, and systems and processes to solve problems using the design process in a methodical and precise manner to innovate and invent design solutions. The integration of STEAM in the teaching and learning of Textile Technology will instill in students the abilities and capabilities to be highly proficient and competent end users and possibly creators of technology as STEAM is an integral component of the core curriculum.

Teachers are encouraged to read this teacher guide carefully to become familiar with the content so that they can be confident to use the new concepts and strategies as well as teach the content well. They can also adjust to suit the needs of the students.

I commend and approve this Grade 11 and 12 Technology and Industrial Arts: Communication Technology Teacher Guide to be used in all high schools throughout Papua New Guinea.

UKE W KOMBRA, PhD
Secretary for Education

INTRODUCTION

The strand Textiles Technology in the Technology and Industrial Arts subject aims to help students become competent and confident users of communication and technology who can make efficient, effective and creative use of basic application software in their everyday activities. It further encourages them to individually and collaboratively apply systems thinking to monitor, analyse, predict and shape the interactions within and between information systems and the impact of these systems on individuals, societies, economies and environments. It embraces the development in technology and emerging technologies using software and applications, safely, ethically and with greater responsibility.

The study of Textile Technology will enhance the students' knowledge to recognize intellectual property, apply creativity and critical thinking skills, collaboration of design process skills, safety practices, and further identify the impacts of textile technology in society. It also aims to provide lifelong skills and opportunities for students to live a productive life as well as a career or pursuing further learning.

In the 21st century, it is important to recognise that textile technology has become part of the educational process for all age levels and should be viewed and taught as a tool for problem solving and decision- making.

Students should be encouraged to analyse, synthesise and evaluate situations at home, and school, thereby, apply textile technology knowledge, skills, values and attitudes to efficiently and effectively prepare for the rapid changes and influences that will and may affect textile technology today and beyond.

Students' employability will be enhanced through the study and application of STEAM principles. STEAM is an integral component of the core curriculum. It is envisioned that the study of STEAM will motivate students to take up academic programs and careers in STEAM related fields. STEAM has been embedded in the Technology and Industrial Arts: Communication Technology curriculum.

Teachers of Textile Technology strands will plan and program the food and textile strands for 13 weeks on a rotational basis with the other 3 strands as they are taught concurrently, hence the total coverage of learning Technology and Industrial Arts as a subject. The learning integration is more relevant including the STEAM approach to teach the essential knowledge, skills, values and attitudes, and processes.

This Technology and Industrial Arts-Textile Technology teacher guide must be used in close consultation with the Technology and Industrial Arts grades 9 and 10 syllabuses. It is to be timetabled for 200 minutes (5 periods) per week in junior high school.

STRUCTURE OF THE TEACHER GUIDE

The Textile Technology Strand Teacher Guide comprises of five main sections that provide essential information that all teachers should know and do to effectively implement the Textile Technology curriculum.

1. General Information of the Subject/Strand

The general information section of the Teacher Guide informs teachers on the Textile Technology Strand under the following headings below;

- Introduction of the Strand Teacher Guide
- Structure of the Strand Teacher Guide
- Purpose of the Strand Teacher Guide
- How to use the Strand Teacher Guide

2. Teaching and Learning Section

The teaching and learning section of the Teacher Guide informs and guides teachers to apply the teaching and learning theories, principles, pedagogies and practices in planning, programing, teaching and assessing students. They are outlined in the headings bulleted below;

- Syllabus and Teacher Guide Alignment
- Learning and Performance Standards
- Core Curriculum
- Science Technology Engineering Arts Mathematics (STEAM)
- Curriculum Integration
- Essential Knowledge, Skills, Values and Attitudes
- Teaching and Learning Strategies
- Strands, Units and Topics
- Sample SBC Lesson Plans

3. Assessment Section

The assessment section of the Teacher Guide informs and guides teachers to plan and program assessment activities, formulate assessment rubrics and apply assessment strategies to assess the course of studies. This section also guides teachers to monitor and report students' progress of learning and performances of the attainment of standards.

4. Glossary, References and Appendices Sections

These sections guide teachers to refer to terms and definitions of the strand/ subject content, references outlined to guide the development of this teacher guide and provides essential information to guide teachers on the content and the delivery of this strand/subject.

PURPOSE OF THE TEACHER GUIDE

This teacher guide describes what teachers should know and do to effectively plan, program, teach and assess grade 11 and Textile Technology content to enable all students to attain the required learning and proficiency standards.

Ample information with thorough guidelines is provided for the teacher to use to achieve the essential Knowledge, Skills, Attitudes and Values (KSAV) embedded in the set national content standards and grade level benchmarks.

The overarching purpose of this teacher guide is to assist teachers to;

- understand the significance of aligning all the elements of standards- based curriculum (SBC) as the basis of achieving the expected level of education quality;
- effectively align all the components of SBC when planning, programming, teaching, and assessing students learning and levels of proficiency;
- effectively translate and align the Technology and Industrial Arts Syllabi and Textile Technology Strand teacher guides to plan, program, teach and assess different Textile Technology Strand Teacher Guide units and topics, and the essential knowledge, skills, attitudes and values (KSAVs) described in the grade – level benchmarks;
- understand the Textile Technology Strand, national content standards, grade-level benchmarks, and evidence outcomes;
- effectively make sense of the content (KSAVs) described in the Textile Technology Strand national content standards and the essential components of the content described in the grade – level benchmarks;
- effectively guide students to progressively learn and demonstrate proficiency on a range of Textile Technology Strand skills, processes, concepts, ideas, principles, practices, values and attitudes;
- confidently interpret, translate and use Textile Technology Strand content standards and benchmarks to determine the learning objectives and performance standards, plan and program appropriately to enable all students to achieve these standards;
- embed the core curriculum in the Textile Technology Strand lesson planning, programming, instruction, and assessment to permit all students to learn and master the core knowledge, skills, values and attitudes required of all students;
- provide opportunities for all students to understand how STEAM has and continues to shape the social, political, economic, cultural, and environment contexts and the consequences, and use STEAM
- principles, skills, processes, ideas and concepts to inquire into and solve problems relating to both the natural and physical worlds (human –made) as well as problems created by STEAM;

- integrate cognitive skills (critical, creative, reasoning, decision-making, and problem solving skills), high level thinking skills (analysis, synthesis and evaluation skills), values (personal, social, work, health, peace, relationship, sustain values), and attitudes in lesson planning, programming, instruction and assessment;

- meaningfully connect what students learn in Textile Technology Strand with what is learnt in other subjects to add values and enhance students learning so they can integrate what they learn and develop in-depth vertical and horizontal understanding of subject content;

- formulate effective SBC lesson plans using learning objectives identified for each of the topics;

- employ SBC assessment approaches to develop performance assessments to assess students' proficiency on a content standard or a component of the content standard described in the grade –level benchmark;

- effectively score and evaluate students' performance in relation to a core set of learning standards or criteria, and make sense of the data to ascertain status of progress towards meeting grade-level and nationally expected proficiency standards,

- use evidence from the assessment of students' performance to develop effective evidence – based intervention strategies to help students making inadequate or slow progress towards meeting the grade-level and national expectations to improve their learning performances.

HOW TO USE THE TEACHER GUIDE

The Grade 11 Textile Technology Strand Teacher Guide is an expansion of the content in the Technology and Industrial Art Syllabus. The Syllabus contains the content standards, benchmarks and evidence outcomes which are expanded into teaching and learning Activities in the Teacher Guide.

The Teacher Guide provides essential information about what the teacher needs to know and do to effectively plan, teach and assess students' learning and proficiency on learning and performance standards. It should be read in conjunction with the syllabus in order to understand what is expected of teachers and students to achieve the envisaged quality of education outcomes.

Teachers must read and understand each of the sections of the Teacher Guide to help them understand the SBC concepts and ideas. A thorough understanding of these components will help teachers meet the teacher expectations for implementing the SBC curriculum, and therefore the effective implementation of Grade 11 Textile Technology Strand in TIA Curriculum.

The scope of learning is translated and programmed according to the four terms. The suggested teaching and learning strategies and the key important instructions provided for teachers can be used to design and manage teaching and learning activities for the students in the classroom.

Assessment methods, assessment samples, reporting and recording strategies contained in this guide will assist teachers to plan assessment in Strands for the school year.

Based on this understanding, teachers should be able to effectively use the teacher guide to do the following:
The strand teacher guide can be used for developing both classroom learning and professional development activities. The document is a useful resource for developing school and community based in-service programs. Teachers must thoroughly read the contents of the documents in order to develop an understanding and do the following;

Determine Learning Objectives and Lesson Topics

- The teaching and learning Standards are derived from the Content Standards and Benchmarks in the Syllabus. The Learning Objectives are extracted from the grade-level benchmarks and are used for teaching topics. And lesson objectives are derived from learning objectives and are used for teaching Lessons.

Identify and Teach Grade Appropriate Content

- Grade appropriate content has been identified and scoped and sequenced using appropriate content organisation principles. The content is sequenced using the spiralling sequence principles. The strand, topics and lesson concepts in the Teacher Guide can be spiralled and taught by Strand, by Topics or by lessons using the Benchmarks. Using the Benchmarks, Content Mapping in Programing will enable teacher to see the content from what the students have already learned in line with current to be taught and linked to the next learning content.

Integrate the core curriculum in lesson planning, instruction and assessment

- This sequencing of content will enable students to progressively learn the essential knowledge, skills, values and attitudes as they progress further into their schooling.

Integrate cognitive, high level and 21st century skills in lesson planning, instruction and assessment

- Lesson titles in the teacher guide were drawn out from the benchmarks. From the lesson titles outlined in the planning and programming section, the values, the attitude, the skills and the knowledge is identified.

Integrate Technology and Industrial Arts: Textile Technology Values and Attitudes in lesson planning, instruction and assessment

- When planning a lesson, it is important that, the values, attitudes, skills and knowledge of the lesson are shown in the teaching and learning activities as displayed in the sample lessons.

Identify and use grade and content appropriate, innovative, differentiated and creative teaching and learning methodologies

- At least one value, one attitude, one skill and one knowledge must be captured in a topic.

Integrate Science, Technology, Engineering, Arts and Mathematics (STEAM) principles and skills in lesson planning, instruction and assessment

- STEAM principles and skills must be effectively taught and learned by students. Teachers should use the teacher guide to help them make informed decisions when selecting the types of teaching and learning methodologies to use in their teaching of the subject content, including STEAM principles and skills.

Plan and address the principles of "Inclusive Teaching and Learning"

Teachers are obliged to create an inclusive learning environment to include students with special needs to promote learning for all. These special needs may include students who are gifted or disadvantaged physically,socially,emotionally and intellectually. Students may display combinations of any of these needs and therefore, the teaching and learning activities must have students with special needs to participate to their fullest abilities. The different types of needs in students include;

- Physical disabilities
- Intellectual disabilities
- Hearing impairment
- Sight-vision impairment
- Speech impairment
- Behavioural and emotional disorders

It is important that the learning activities for TIA,Textile Technology are inclusive and foster the learning needs of all students.

SYLLABUS AND TEACHER GUIDE ALIGNMENT

The Grade 11 Textile Technology Strand Teacher Guide are closely aligned and complementary to Technology and Industrial Art Syllabus.
They are the essential focus points for teaching and learning the essential knowledge, skills, values and attitudes.

Syllabus and Teacher Guide Alignment	
Syllabus Outlines the ultimate aim and goals, and what to teach and why teach it	**Teacher Guide** Describes how to plan, teach, and assess students' performance
• Overarching and SBC principles • Content overview • Core curriculum • Essential knowledge, skills, values and attitudes • Strands and units • Evidence outcomes • Content standards and grade-level benchmarks • Overview of assessment, evaluation, and Reporting	• Determine topics for lesson planning, instruction and assessment • Formulate learning objectives • Plan SBC lesson plans • Select teaching and learning strategies • Implement SBC assessment and evaluation • Implement SBC reporting and monitoring

The syllabus outlines the ultimate aim and goals of SBE and SBC, what is to be taught and why it should be learned by students, the underlying principles and articulates the learning and proficiency standards that all students are expected to attain. On the other hand, the teacher guide expands on what is outlined in the syllabus by describing the approaches or the how of planning, teaching, learning, and assessing the content so that the intended learning outcomes are achieved.

This teacher guide should be used in conjunction with the syllabus. Teachers should use these documents when planning, teaching and assessing Grade10 Textile Technology Strand content. Teachers will extract information from the syllabus (e.g., content standards and grade-level benchmarks) for lesson planning, instruction and is for measuring students' attainment of a content standard as well as progress to the next grade of schooling.

Learning and Performance Standards Alignment

Content Standards, Benchmarks and Evidence Outcomes are linked to Learning Objectives, Lesson Objectives and Performance Standards in the Teacher Guide. (see table). There is a close linear relationship between these standards. Students' performance on a significant aspect of a benchmark (KSVA) is measured against a set of performance standards or criteria to determine their level of proficiency using performance assessment. Using the evidence from the performance assessment, individual student's proficiency on the aspect of the benchmark assessed and progression towards meeting the benchmark and hence the content standard are then determined.

Standards Alignment	
Standards in Syllabus	**Standards in Teacher Guide**
• SBC Aims and Goals • Content Standard • Benchmarks • Evidence Outcomes	• Learning Objectives • Lesson Objectives • Essential Knowledge, Skills, Values and Attitude • Performance Standard

Standard Alignment

Standard Alignment shows the link between different standards in the Syllabus and Teacher Guide. It begins with SBC Aims and Goals which are National Standards in which the Syllabus Standard are derived from. The Content Standards or Subject Standards are expanded into Benchmarks which are Achievable Benchmarks for particular Grade Levels and are translated into the Teacher Guide as Teaching and Learning Standards and Assessment Standards. And they become the components of Unit of Work (UOW).

The UOW consists of the Achievable Standards for a particular Grade Level and is translated into Teaching and Learning Activities and Assessment Tasks.

It is essential that teachers know and can do standards alignment when planning, teaching, and assessing students' performance so that they can effectively guide their students towards meeting the grade-level benchmarks (grade expectations) and subsequently the content standards (national expectations).

Below is a diagram to show the relationship between Standards in the Syllabus and the Teacher Guide.

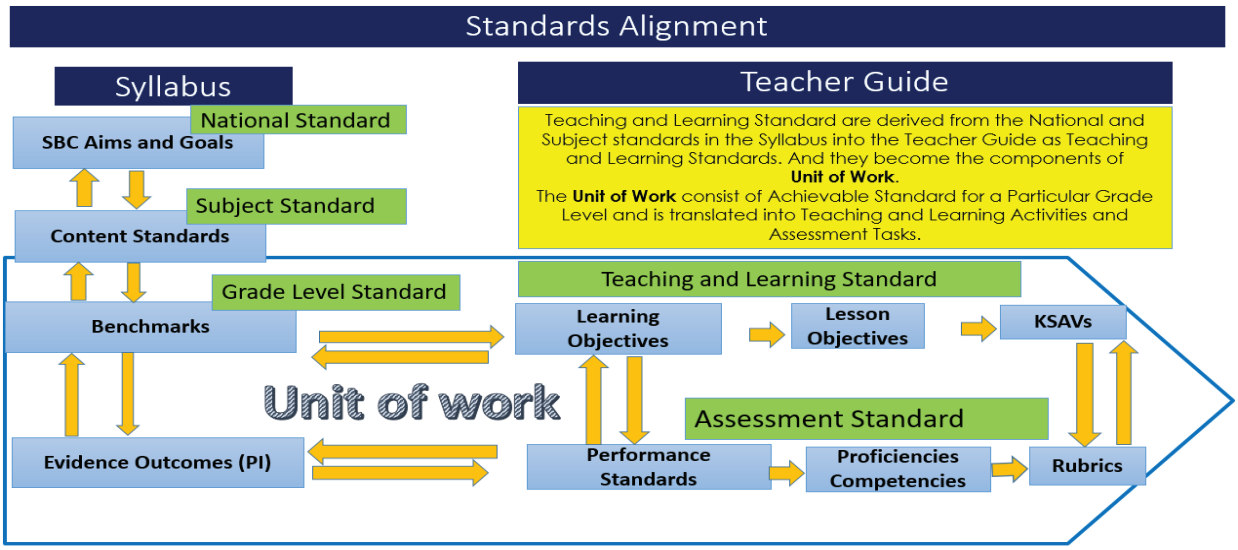


Figure 1 **Standards Alignment that shows the alignment of standards in the syllabus and teacher guide**

LEARNING AND PERFORMANCE STANDARDS

Standards define the expected level of education quality that all students should achieve at a particular point in their schooling.

Content standards, benchmarks, and learning objectives are called learning standards while performance and proficiency standards (evidence outcomes) can be categorised as performance standards. These standards are used to measure students' performance, proficiency, progression and achievement of the desired level of education quality. Teachers are expected to understand and use these standards for programming, lesson planning, instruction and assessment.

Student's progression and achievement of education standard(s) are measured using performance standards or criteria to determine their demonstration or performance on significant aspects of the standards and therefore their levels of proficiency and competency. When they are judged to have attained a proficiency on a content standard or benchmark or components of these standards, they are then deemed to have met the standard(s) that is, achieve the intended level of education quality.

Content Standards

Content standards are evidence-based, rigorous and comparable regionally and globally. They have been formulated to target critical social, economic, political, cultural, environment, and employable skills gaps identified from a situational analysis. They were developed using examples and experiences from other countries and best practice, and contextualized to PNG contexts.

Content standards describe what **(content - knowledge, skills, values, and attitudes)** all students are expected to know and do **(how well students must learn and apply what is set out in the content standards)** at each grade-level before proceeding to the next grade. These standards are set at the national level and thus cannot be edited or changed.

Content Standards:

- are evidenced-based;
- are rigorous and comparable to regional and global standards;
- are set at the national level;
- state or describe the expected levels of quality or achievement;
- are clear, measurable and attainable;
- are linked to and aligned with the ultimate aim and goals of SBE and SBC and overarching and SBC principles;
- delineate what matters, provide clear expectations of what students should progressively learn and achieve in school, and guide lesson planning, instruction, assessment;
- comprise knowledge, skills, values, and attitudes that are the basis for quality education;
- provide teachers a clear basis for planning, teaching, and assessing lessons;

- provide provinces, districts, and schools with a clear focus on how to develop and organise their instruction and assessment programs as well as the content that they will include in their curriculum.

Benchmarks

Benchmarks are derived from the content standards and benchmarked at the grade-level. Benchmarks are specific statements of what students should know (i.e., essential knowledge, skills, values or attitudes) at a specific grade-level or school level. They provide the basis for measuring students' attainment of a content standard as well as progress to the next grade of schooling.

Grade-level benchmarks:

- are evidenced-based;
- are rigorous and comparable to regional and global standards;
- are set at the grade level;
- are linked to the national content standards;
- are clear, measurable, observable and attainable;
- articulate grade level expectations of what students are able to demonstrate to indicate that they are making progress towards attaining the national content standards;
- provide teachers a clear basis for planning, teaching, and assessing lessons;
- state clearly what students can do with what they have learned at the end of each school-level;
- enable students' progress towards the attainment of national content standards to be measured, and
- enable PNG students' performance to be compared with students in other countries.

Learning Objectives

Learning or instructional Objectives are precise statements of educational intent. They are formulated using a significant aspect or a topic derived from the benchmark, and is aligned with the educational goals, content standards, benchmarks, and performance standards. Learning objectives are stated in outcomes language that describes the products or behaviours that will be provided by students. They are stated in terms of measurable and observable student behaviour. For example, students will be able to identify all the main towns of PNG using a map.

Performance Standards

Performance Standards are concrete statements of how well students must learn what is set out in the content standards, often called the **"be able to do"** of "what students should know and be able to do." Performance standards are the indicators of quality that specify how competent a students' demonstration or performance must be. They are explicit definitions of what students must do to demonstrate proficiency or competency at a specific level on the content standards.

Performance standards:

- measure students' performance and proficiency (**using performance indicators**) in the use of a specific knowledge, skill, value, or attitude in real life or related situations.

- provide the basis (**performance indicators**) for evaluating, reporting and monitoring students' level of proficiency in use of a specific knowledge, skills, value, or attitude.
- are used to plan for individual instruction to help students not yet meeting expectations (**desired level of mastery and proficiency**) to make adequate progress towards the full attainment of benchmarks and content standards.
- are used as the basis for measuring students' progress towards meeting grade-level benchmarks and content standards.

Proficiency Standards

Proficiency standards describe what all students in a particular grade or school level can do at the end of a strand, or unit. These standards are sometimes called evidence outcomes because they indicate if students can actually apply or use what they have learnt in real life or similar situations. They are also categorized as benchmarks because that is what all students are expected to do before exiting a grade or are deemed ready for the next grade.

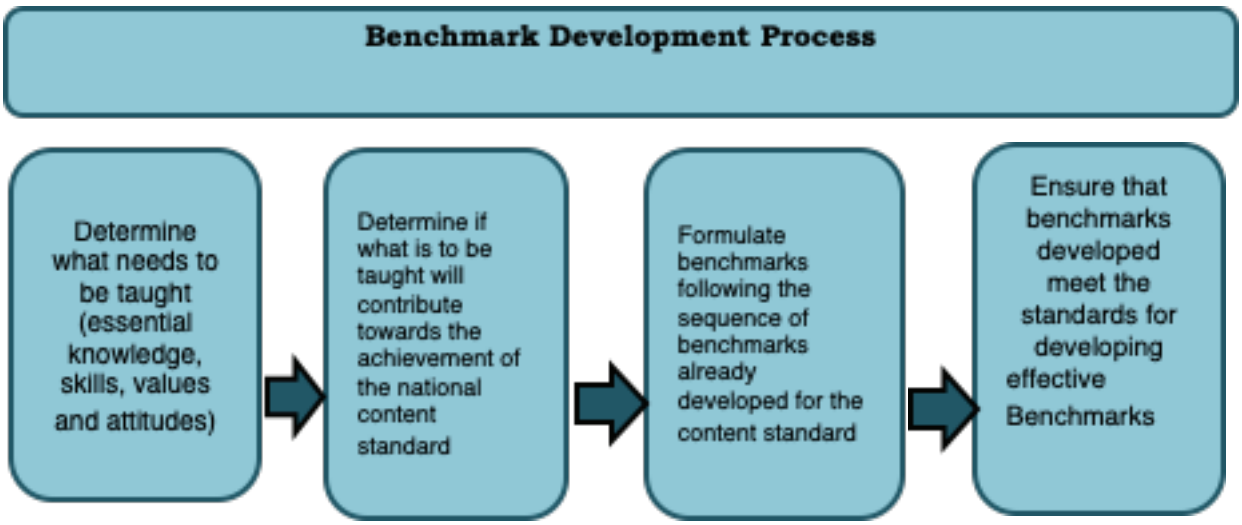
As per presented above, should teachers wish to develop additional benchmarks to cater for their students learning needs. You are encouraged to follow the process below to develop them.

Development of Additional Benchmarks

Teachers should develop additional benchmarks to meet the learning needs of their students. They should engage their students to learn about local, provincial, national and global issues that have not been catered for in the grade-level benchmarks but are important and can enhance students' understanding and application of the content. However, it is important to note that these benchmarks will not be nationally examined as they are not comparable.

Only the benchmarks developed at the national level will be tested. This does not mean that teachers should not develop additional benchmarks. An innovative, reflect, creative and reflexive teacher will continuously reflect on his/her classroom practice and use evidence to provide challenging, relevant, and enjoyable learning opportunities for his/her students to build on the national expectations for students.

Teachers should follow the following process when developing additional grade-level benchmarks.



CORE CURRICULUM

Core curriculum refers to a core set of common learnings (knowledge, skills, values, and attitudes) that are integrated into the content standards and grade-level benchmarks for all subjects. The core curriculum includes:

- Cognitive skills (critical and creative thinking);
- Reasoning, problem-solving and decision-making skills;
- High level thinking skills (analysis, evaluation and synthesis);
- 21st century skills;
- STEAM principles and skills;
- Seven Principles for Teaching Procedural and Technical Skills (Plan ahead, Demonstration, Observation of learner in action, Provide specific feedback, Encourage self-evaluation, Allow learner practice, Prepare to modify approach)
- Working Diagrams (sketching and technical drawing)
- Reading, writing and communication skills, and
- Essential values and attitudes.

Textile Technology teachers are expected to include the core learning's in their lesson planning, teaching and assessment of students in all their lessons. In addition to these are the essential core curriculums; fabrics and fibres and clothing and textiles. Teachers may include other core curriculum concepts in relation to the subject to cater for students learning needs.

A practical example of integrating core curriculum in Teaching and Learning

Teachers can identify a set of core curriculum to teach in one lesson for example; in Textile Technology students may be posed with an opportunity to find solutions on how technology can be used to utilise one of the core concepts of in their area. The core concepts include; marketing, sales, design and manufacturing, technology, services, operations in textile industries.

Students will be required to use what they learnt in Technology and Industrial Arts about textile technology in people's livelihood in terms of marketing as a quicker and cheaper way of advertising and selling textile products.

They can use STEAM principles and skills in finding cause and solutions, use high level thinking skills to analyse and evaluate the effects and how to improve marketing, use decision making and critical thinking skills to find the solutions for marketing a textile product. They can also use textile technology to design a product for an e-marketing model and be able to confidently and boldly communicate their findings and present intelligent and convincing arguments, which we can conclude that l earning of the core curriculum is evident.

If students can be able to demonstrate mastery, proficiency and competency of core curriculum in such a manner, then the learning of core curriculum has been achieved.

SCIENCE, TECHNOLOGY, ENGINEERING, ARTS, MATHEMATICS

STEAM education is an integrated, multidisciplinary approach to learning that uses Science, Technology. Engineering, Arts and Mathematics as the basis for inquiring about how STEAM has and continues to change and impact the social, political, economic, cultural and environments contexts and identifying and solving authentic (real life) natural and physical environment problems by nitrating STEAM- based principles, processes, skills, values and attitudes to prepare them for careers, higher education and citizenship.

Textiles Technology utilises both the goals of STEAM rather than just the goal of problem- solving. This is to ensure that all students are provided opportunities to learn, It integrates and demonstrates proficiency on all essential STEAM principles, processes, skills, values and attitudes to prepare them for careers, higher education and citizenship.

Objectives:

Students will be able to:

- Examine and use evidence to draw conclusions about how STEAM has and continues to change the social, political, economic, cultural and environmental contexts.
- Investigate and draw conclusions on the impact of STEAM solutions to problems on the social, political, economic, cultural and environments contexts.
- Identify and solve problems using STEAM principles, skills, concepts, ideas and process
- Identify, analyze and select the best solution to address a problem.
- Build prototypes or model of solutions to problems.
- Replicate a problem solution by building models and explaining how the problem was or could be solved.
- Test and reflect on the best solution chosen to solve a problem.
- Collaborate with others on a problem and provide a report on the process of problem solving used to solve the problem.
- Use skills and processes learnt from lessons to work on and complete STEAM related projects.
- Demonstrate STEAM principles, skills, processes, concepts and ideas through simulation and modeling.
- Explain the significance of values and attitudes in problem solving.

STEAM Problem -Solving Methods and Approaches

Problem –solving involves the use of problem- solving methods and processes to identify and define a problem, gather information to understand its causes, draw conclusions, and use the evidence to design and implement solutions to address it. Even though, there are many different problems-solving methods and approaches; they share some of the steps of problem-solving, for example:

- Identifying the problem;

- Understanding the problem by collecting data;
- Analyse and interpret the data;
- Draw conclusions;
- Use data to consider possible solutions;
- Select the best solution;
- Test the effectiveness of the solution by trailing and evaluating it, and
- Review and improve the solution.

STEAM problem-solving processes go from simple and technical to advance and knowledge- based processes. However, regardless of the type of process used students should be provided with opportunities to learn the essential principles and processes of problem solving and more significantly, to design and create a product that addressed a real problem and meets a human need.

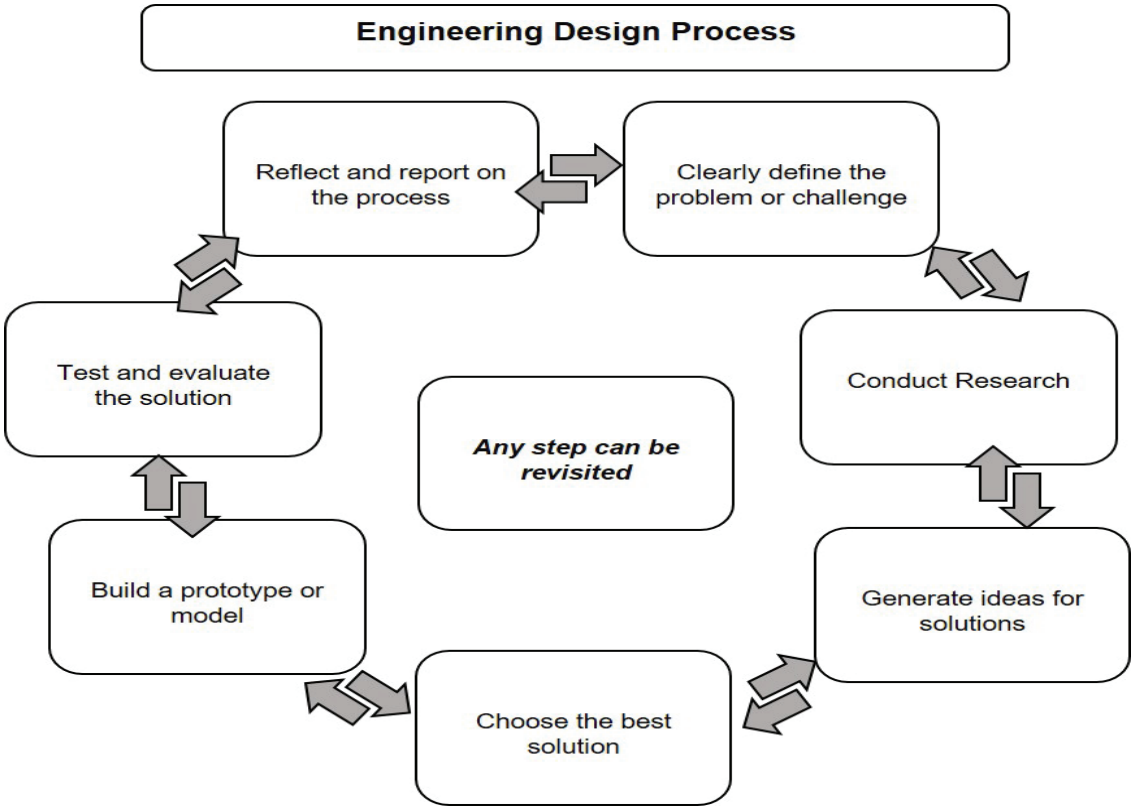
Engineering Design Process

Technological fields use engineering design process to choose the best solution to solve the problem.

It is an open-ended problem solving process that involves the full planning and development of products or services to meet identified needs. It involves the following sequence of steps:

- Analyze the context and background, and clearly define the problem;
- Conduct research to determine design criteria, financial or other constraints, and availability of materials;
- Generate ideas for potential solutions, using processes such as brainstorming and sketching;
- Choose the best solution;
- Build a prototype or model
- Test and evaluate the solution;
- Repeat steps as necessary to modify the design or correct faults;
- Reflect and report on the process.

This sequential engineering design process steps described above are illustrated in the diagram below.



Students should be guided through every step of the process so that they can understand it and explain it and its importance, and use the steps and the whole process proficiently to identify, investigate and solve problems.

They should be provided with opportunities to practice and reflect on each step until they demonstrate the expected level of proficiency before moving on to the next one.

The sequence of steps is given as a guide below:

Step 1: Idea Generation

Step 2: Research

Step 3: Planning (Design Brief)

Step 4: Prototyping

Step 5: Production

Step 6: Costing

Step 7: Marketing

This STEAM sample is using Business Studies.

Step 1: IDEA GENERATION

- Ideation, iteration, and brain storming new product ideas.

Students should be guided and provided opportunities to identify human made, natural and physical environment problems using their five senses and describe what the problem is and its likely causes.

Example: Irregularity of keeping records of stocks of goods and materials

Step 2: RESEARCH

- Questionnaires Feedback from a substantial and unbiased audience for product validation.

After the problem is identified and described, several questions will be derived from a main issue question. The questionnaire will be formulated and then will be answered in the survey. This questionnaire will guide the researcher in conducting research and investigation for the appropriate solution to the problem.
The questions will be targeted towards the usefulness of the product and the interests to purchase the finished product.

Example: Main Question 'How can records of stocks be kept efficiently and managed effectively?'

Step 3: PLANNING (DESIGN BRIEF)

- Bring the product to life through sketching, illustrations and working diagrams.

Creating working sketches, illustrations and working diagrams helps the researcher to better understand his or her research problem, refine the research question and decide on investigation approach before the investigation is conducted.
Example: Description of an Authentic Situation

The researcher may look into the current practices of stock taking in schools, or other subject areas for tips or conduct online search on how to improve the records of stocks on relevant websites. The researchers may even analyse information and past practices or similar but better regarding the stock taking records keeping.

Step 4: PROTOTYPING

- Create a finished prototype product to use as a sample for production.

The researcher will make or develop a prototype of the solution and test how it would be used to solve the problem.

Example: Prototype

The illustration of sketches in the planning stage can be created in the MS Excel and its functions can be identified as the basic solution for Stocking Records.

Step 5: PRODUCTION

- Gather materials and production

This step is the gathering of materials and producing of the product from the best

prototype. This involves the identification of lists of materials, procedural steps with their respective tools or equipment to be used to produce the intended product.

It is obviously known during the production that certain procedural steps are needed to be done in certain order before the others because later steps depend on them being prioritized. In addition, concepts of other subjects needed for producing the product maybe gathered, integrated and utilised in the production of the product.

Example*: *Producing the product

Step 6: COSTING

Total cost of product sold (COGS)to determine retail price and gross margin

This stage is known as product pricing which involves the calculation of the costs of materials used, labour costs mark up and selling prices. The selling price may be influenced by responses to the questions in the survey due to the interest of the buyers which will determine the cost of the product.

The cost for producing the item are;

Material Unit cost K_____
Labour Cost(no of hours spentx your Rate) 10 hrs x K_____= K_____
Selling/Marketing cost K_____

A simple formula to calculate a good mark-up percentage for the project:

MARKUP PERCENTAGE =(SELLING PRICE –UNIT COST)/UNIT COST X 100%

Simply take the sales price minus the unit cost and divide the number by the unit cost. Then multiply by 100 to determine the mark-up percentage.

For example: if the project costs K50.00to make and the selling price is K75.00then the mark-up percentage would be 50%. (K75.00- K50.00=0.50 x 100= 50%.
Example: Pricing the product.

Step 7: MARKETING

- Launch product into market

This stage involves the marketing of the finished product. The potential buyers of the product are the targeted audience that were used in the research.

The finished product can be promoted using flyers, put out on public places and market page can be created on social media networks.

STEAM- Based Lesson Planning

Effective STEAM lesson planning is the key to the achievement of the expected

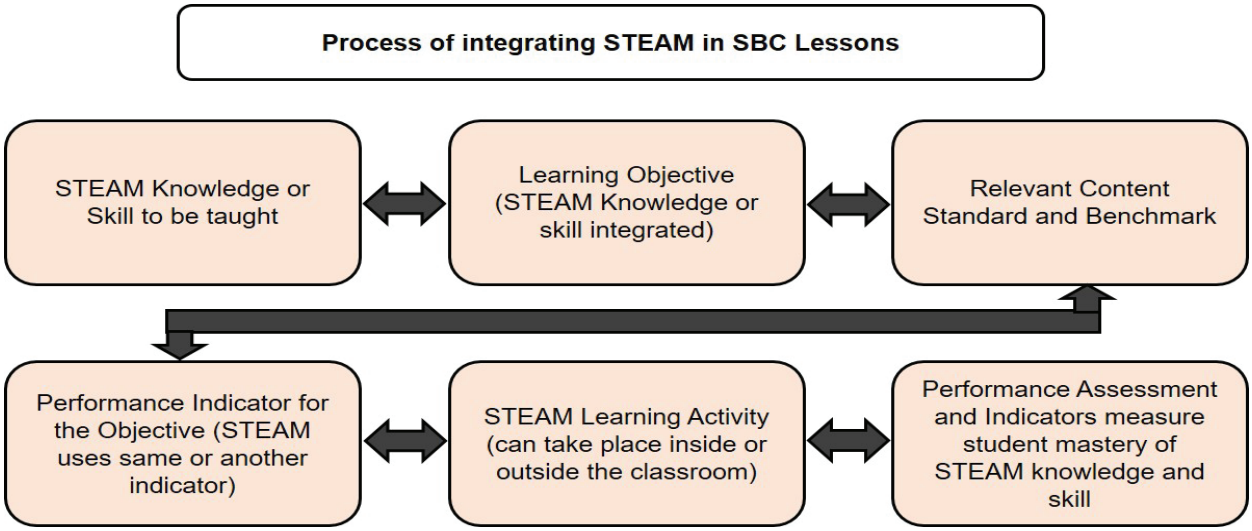
outcomes. STEAM Skills can be planned and taught using separate STEAM- based lesson plans or integrated into the standards- based lesson plans. To effectively do this, teachers should know how to write effective standards and STEAM-based lesson plans.

Developing STEAM-based Lesson Plans

An example of a standards- based lesson is provided below. Teachers should use this to guide them to integrate STEAM content and teaching, learning and assessment strategies into their standards- based lesson plans.

Integration of STEAM problem-solving skills into standards-based lesson plans

Process for Integrating STEAM Principles and Problem-Solving Skills into Standards-Based Lessons



Teachers should follow the steps given below when integrating STEAM problem-solving principles and skills into their standards-based lesson plans.
Teachers should follow the steps given below when integrating STEAM problem-solving principles and skills into their standards-based lesson plans.

Step 1: Identify the STEAM knowledge or skill to be taught (From the table of KSAVs for each content standard and bench mark). *This could be already being captured in the learning objective stated in the standards-based lesson plan.*

Step 2: Develop and include a performance standard or indicator for measuring student mastery of the STEAM knowledge or skill (e.g. level of acceptable competency or proficiency) *if this is different from the one already stated in the lesson plan.*

Step 3: Develop student learning activity (An activity that will provide students the opportunity to apply STEAM knowledge or skill specified by the learning objective and appropriate statement of standards). Activity can take place inside or outside the classroom and during or after school hours.

Step 4: Develop and use performance descriptors (standards or indicators) to analyse student STEAM related behaviours or products (results or outcomes), which provide evidence that the student has acquired and mastered the knowledge or skill of the learning objective specified by the indicator(s) of the standard(s).

STEAM- Based Assessment

STEAM-based assessment is closely linked to standards-based assessment where assessment is used to assess student's level of proficiency or competency of a specific knowledge, skill, value or attitude taught using a set of performance standards (indicators or descriptors). The link also includes the main components such as the purpose, the assessment principles and assessment strategies and tools.

In STEAM-based assessment, assessment is designed for what the students should know and be able to do. In STEAM learning students are assessed in a variety of ways including portfolios, project/problem-based assessment, backward designs, authenticity assessment, or other students centered approaches. When planning and designing the assessment, teachers should consider the authenticity of the assessment by designing an assessment that relates to a real world task or discipline specific attributes (such as simulation, role play, placement assessment, live projects, debates) should make the activity meaningful to the student, and therefore be motivating as well as developing employability skills and discipline specific attributes.

Effective STEAM-Based Assessment strategies

The following six sections describe six assessment tools and strategies shown to impact teaching and learning as well as help teachers foster a 21st century learning environment in their classrooms.

1. Rubrics
2. Performance-based assessment (PBAs)
3. Portfolios
4. Student self-assessment
5. Peer-assessment
6. Students response system (SRS)

Although the list does not include all innovative assessment strategies, it includes what we think are the most common strategies, and ones that may be particularly relevant to the educational context of developing countries in this 21st century. Many of the assessment strategies currently use fit under one or more of the categories discussed. Furthermore, it is important to note that strategies also connect in a variety of ways.

1. Rubrics

Rubrics are both a tool to measure students' knowledge and ability as well as an assessment strategy. A rubric allows teachers to measure certain skills and abilities not measurable by standardized testing systems that assess direct knowledge at a fixed moment in time. Rubrics are also frequently used as part of other assessment

strategies (portfolios, performances, projects, peer-review and self-assessment), they will be discussing in those sections as well.

2. Performance- Based Assessments

Performance- Based Assessments (PBA), also known as authentic assessment are generally used as a summative evaluation strategy to capture not only what students know about a topic, but if they have the skills to apply that knowledge in a; real-world' situation by asking them to create an end product. PBA pushes students to synthesize their knowledge and apply their skills to a potentially unfamiliar set of circumstances that is likely to occur beyond the confines of a controlled classroom setting. The implementation of performance-based assessment strategies can also impact other instructional strategies in the classroom.

3. Portfolio Assessment

Portfolios are a collection of student work gathered over time that is primary used as a summary evaluation method. The most salient characteristic of the portfolio assessment is that rather than being a snap shot of a student's knowledge at one point in time (like a single standardized test) it highlights student effort, development, and achievement over a period of time; portfolios measure as student's ability to apply knowledge rather than simply regurgitate. They are considered both student-centered and authentic assessment of learning.

4. Self-Assessment

Its main purpose is for students to identify their own strengths and weakness and to work to make improvements to meet specific criteria. Self-assessment occurs when students judge their own work to improve performance as they identify discrepancies between current and desired performance. In this way, self-assessment aligns well with standards-based education because it provides clear targets and specific criteria against which students or teachers can measure learning.

Self-assessment is used to promote self-regulation to help students reflect on their progress and to inform revisions and improvements on a project or paper in order for self-assessment to be truly effective, four conditions must be in place, the self-assessment criteria, criteria is negotiated between the teachers and students, students are taught how to apply the criteria, students receive feedback on their self-assessments and teachers help students use assessment data to develop an action plan.

5. Peer Assessment

Peer assessment, much like self-assessment, is a formative assessment strategy that gives students a key role in evaluating learning. Peer assessment approaches can vary greatly but, essentially it is a process for learners to consider and give feedback to other learners about the quality or value of their work. Peer assessments can be used for a variety of products like papers, presentations, projects and or other skills behaviors. Peers assessment is understood as more than only a grading procedure and is also envisioned as teaching strategy since engaging in the process develops both the assessor and the assesses skills and knowledge. The primary goal for using peer assessment is to provide feedback to the learners. This strategy may be particularly relevant in the classrooms with many students per teacher since

student time will be more plentiful than teacher time, although any single student's feedback may not be rich or in-depth as teachers' feedback, the research suggests that peer assessment can improve learning.

6. Students Response system

Students response system (SRS), also known as classroom response (CRS), audience response system (ARS) is a general term that refers to a variety of technology-based formative assessment tools that can be used to gather student- level data instantly in the classroom. Through the combination of hardware, (voice recorders, PC, internet connection, projector and screen) and software.

Teachers can ask students a wide range of questions (both closed and open ended), where students can respond quickly and anonymously, and the teacher can display the data immediately and graphically. The use of technology also includes a use of video which examines how a range of strategies can be used to assess students understanding. The value of SRS comes from the teachers analyzing information quickly and then devising real-time instructional solutions to maximize students learning. This includes a suggested approach to help teachers and trainers assess learning.

ESSENTIAL KNOWLEDGE, SKILLS and ATTITUDES

Students' level of proficiency and progression towards the attainment of content standards for Technology and Industrial Arts subject will depend on their mastery and application of essential knowledge, skills, values, and attitudes in real life or related learning experiences and situations across the secondary curriculum.

Examples of the different types of knowledge, skills, values and attitudes, including processes, that all students are expected to learn and master as they progress through the grades are provided in;

- Technology and Industrial Arts syllabuses for grades 9&10 page 24-27 and
- Technology and Industrial Arts syllabuses for grades 11&12 pages 23-26.

These knowledge, skills, values and attitudes have been integrated into the content standards, benchmarks and performance standards developed for Technology and Industrial Arts subject.

Teachers are expected to plan and teach these in their lessons, and assess students' performance and proficiency, and progression towards the attainment of content standards.

Textile and Industrial Arts

Technology and Industrial Arts provides and insti in students the confidence to use a range of specific knowledge, skills, values and attitudes in various technologies. These are scoped and embedded within the strands curriculum content in the subject, with the intension to create related career pathways. Each strand content encourages students to be proactive, competent, creative, responsible and reflective learners, enabling them to pursue career opportunities in respective fields of technology studied in this subject.
Provided herein are recognised knowledge for the subject which are applicable across the strands.

Types of common knowledge for Technology and Industrial Arts

These are specific content knowledge for the subject. They include;	
• Creativity • Branding • Communication skills • Technical expertise • Industry expertise • Critical thinking- • Information Technology skills • Innovation	• Building and Engineering Knowledge. • Physical Strength and Stamina. • Mathematical formulas in technology • **Technology and Industrial** Language Coordination. • Technology Skills. • Problem Solving Skills. • Prototype

Technology and Industrial Arts is a skills oriented subject, therefore embraces all the commonly recognised skills which can be used across the strands scoped in the content. Listed here for teachers convenience are commonly recognised skills across the strands.

Types of Skills for Technology and Industrial Arts

These are specific content Skills for the strand., They include;	
• Creativity • Critical thinking • Technical knowledge • Commercial awareness of textile industry • Research and data handling capacity • Critical analysis and interpretation of materials • Management skills • Organisational Skills. • Problem solving skills • Mathematical skills • Language Literacy skills • Leadership • Innovative skills • trans formational skills	• Textile construction Skills • Focus Communication skills (approachability, circumstantial awareness, diligence, efficiency, thoroughness • Multitasking skills • Attention to detail skills (multitasking , approachability, • Technical Skills for fashion designing • Decision making skills • Textile technology soft skills • logical thinking • collaboration • teamwork • Textile Design engineering • consumer Service • Modelling

Types of Values

Personal engagement and civic engagement strategies help young people to acquire and apply skills and dispositions that will prepare them to become competent and responsible citizens.

Personal Values (importance, worth, usefulness, etc.)

Core values	Sustaining values
• Sanctity of life • Truth • Aesthetics • Honesty • Human • Dignity • Rationality • Creativity • Courage • Liberty • Affectivity • Individuality	• Self-esteem • Self-reflection • Self-discipline • Self-cultivation • Principal morality • Self-determination • Openness • Independence • Simplicity • Integrity • Enterprise • Sensitivity • Modesty • Perseverance

Social Values

Core Values	Sustaining Values
• Equality • Kindness • Benevolence • Love • Freedom • Common good • Mutuality • Justice • Trust • Interdependence • Sustainability • Betterment of human kind • Empowerment	• Plurality • Due process of law • Democracy • Freedom and liberty • Common will • Patriotism • Tolerance • Gender equity and social inclusion • Equal opportunities • Culture and civilization • Heritage • Human rights and responsibilities • Rationality • Sense of belonging • Solidarity • Peace and harmony • Safe and peaceful communities

Types of Attitudes

Attitudes - Ways of thinking and behaving, points of view	
• Optimistic • Participatory • Critical • Creative • Appreciative • Empathetic • Caring and concern • Positive • Confident • Cooperative	• Responsible • Adaptable to change • Open-minded • Diligent • With a desire to learn • With respect for self, life, equality and excellence, evidence, fair play, rule of law, different ways of life, beliefs and opinions, and the environment.

Textile Technology Strand

The textile technology strand encourages students to “think out of the box”. This simply means to think openly and freely beyond the learning situation to bring about fresh creative ideas into the classroom lessons. This gives opportunity to the students to apply creativity and critical thinking to participate. Teachers must ensure that even students with rudimentary creativity skills end up improvising them

Types of knowledge for Textile Technology

These are specific content knowledge for the subject. They include;	
• technical knowledge of fabric manufacturing, • yarn preparation, • textile dyeing and bleaching, • textile construction methods, • all the basics of fibre, warp, weft, weave etc.	• Manufacturing of textiles. • Procurement of raw materials. • Yarn preparation. • Analysis of materials. • Printing and dyeing. • Painting techniques. • Traditional dyeing techniques like tie and dye, batik, (kalamkari,) screen printing, (stencilling), transfer printing, and block printing. • Application of colour theory. • Knowledge of luminosity and colour spectrum. • Fabric cutting, sewing, weaving techniques. • Analysis and interpretation of materials.

Processes in Technology & Industrial Arts

Technology and Industrial Arts expounds on the classroom practices using processes for effective and evidence based lesson deliveries. The commended/suggested processes are for teachers to use as the starting points planning skills or practice based lessons in any of the strands as presented in the subject syllabus.

Types of Processes- Inquiry processes for Technology & Industrial Arts subject

Technology & Industrial Arts Inquiry processes include: (Accept for the TG)
• Gathering information • Analysing information • Evaluating information • Making judgements • Taking actions • Instructional technology • Integration process • Project planning process • Organisation of learning experiences

Technology & Industrial Arts - Inquiry Processes

Engage and Ask	How will I engage my students in the topic and prompt them to ask questions? • Determine the enduring understandings about the topic being studied. • Engage your students with the topic by grabbing their interest with a hook connected to the enduring understandings. • Allow students to generate questions based upon the topic and hook. • Determine what questions will be essential to achieving the enduring understandings. (Student generated or teacher determined • With students, determine what other information is needed in order to fully answer the questions.
Think **Critically**	How will students access and analyse information about this topic? • Have students think about where they can find answers to the questions posed about the topic. • Gather and organize multiple primary and secondary sources. • Ensure that sources used expose students to different perspectives and viewpoints about the topic. • Students should use sources to collect, analyse, and interpret data. • Ensure students are analysing sources for credibility, bias, and perspective in order to identify gaps in the research.

Draw **Conclusion**	How will students synthesize ideas to answer the questions posed based on sources used? • Students should engage in civic discussion to answer the questions posed while respecting diverse opinions. • Engage students in evaluating possible courses of action and their consequences. • Students should make and justify an informed decision or choice and/or design an action plan supported by evidence from sources. • Have students evaluate the consequences of a decision or choice. • Allow students to make revisions based on feedback and further study.
Communicate **Findings**	How will students demonstrate what they have learned and take action on that learning? • Determine how students will apply what they have learned and share their findings with others. • Explore appropriate audiences for students to present conclusions. • Determine if there is an opportunity for students to take action and influence others to make more informed decisions. • Have students develop strategies to persuade others, including policy makers when applicable. • Prepare students to defend their analysis against alternative.

Below is how the Technology **& Industrial Arts** Inquiry Process will be taught in the classroom. Be specific as you make notes of the activities or prompts you will use to ensure students will have the opportunity to practice these skills as a requirement in the Grade 9 content standards.

Technology & Industrial Arts Enquiry

1. **Developing Questions and Planning Inquiries**

   a. *Constructing Essential Questions*

      - Address essential questions that reflect an enduring issue in the field

   b. *Constructing Supporting Questions*

      - Explain how supporting questions contribute to an enquiry.

   c. *Determining Helpful Sources*

      - Develop new support or essential questions through investigations, collaboration and use diverse sources.

2. Evaluating Sources and Using Evidence

a. Gathering and Evaluating Sources

- Gather and evaluate information from multiple sources while considering the origin, credibility, point

of view, authority, structure, context and corroborative value of the sources.

b. Developing Claims and Using Evidence

Identify evidence that draws information from multiple sources to revise or strengthen claims.

- Communicating Conclusions and Taking Informed Action

c. Communicating Conclusions

- Construct and evaluate explanations and arguments using multiple sources and relevant, verified information.

d. Critiquing Conclusions

- Articulate explanations and arguments to a targeted audience in diverse setting.

e. Taking Informed Action

- Use interdisciplinary lenses to analyse the causes and effects of and identify solutions to local,
regional or global concerns.
- Use deliberative processes and apply democratic strategies and procedures to address local, regional
or concerns and take action in or out of school.

5. Literacy Skills

A strong emphasis must be placed on various types of literacy, from financial to technological, from media to mathematical, from content to cultural. Literacy may be defined as the ability of an individual to use information to function in society, to achieve goals and to develop her or his knowledge and potential.
Teachers emphasize certain aspects of literacy over others, depending on the nature of the content and skills they want students to learn.

The following literacy skills are intended to be exemplary rather than definitive	
• Listens, read, write, and speak with comprehension and clarity • Define and apply discipline-based conceptual vocabulary • Describe people, places, and events, and the connections between and among them • Arrange events in chronological sequence • Differentiate fact from opinion • Determine an author's purpose • Determine and analyse similarities and differences • Analyze cause and effect relationships • Explore complex patterns, interactions and relationships • Differentiate between and among various options	• Listens, read, write, and speak with comprehension and clarity • Define and apply discipline-based conceptual vocabulary • Describe people, places, and events, and the connections between and among them • Arrange events in chronological sequence • Differentiate fact from opinion • Determine an author's purpose • Determine and analyse similarities and differences • Analyse cause and effect relationships • Develop an ability to use and apply abstract principals • Explore and/or observe, identify, and analyse how individuals and/or societies relate to one another

6. High Level Thinking Skills

These skills include analysis, synthesis, and evaluation skills.

i. *Analysis Skills* – Analysis skills involve examining in detail and breaking information into parts by identifying motives or causes, underlying assumptions, hidden messages; making inferences and finding evidence to support generalisations, claims, and conclusions.

Key Words				
Analyse	Differences	Find	List	Similar to
Appraise	Discover	Focus	Motivate	Simplify
Arrange	Discriminate	Function	Omit	Take part in
Assumption	Discussion	Group	Order	Test for
Breakdown	Distinction	Highlight	Organize	Theme
Category	Distinguish	In-depth	Point out	
Cause & effect	Dissect	Inference	Research	
Choose	Divide	Inspect	See	
Classify	Establish	Isolate	Select	
Comparing	Examine	Investigate	Separate	

ii. *Synthesis Skills* – Synthesis skills involve changing or creating something new, compiling information together in a different way by combining elements in a new pattern proposing alternative solutions.

iii. *Evaluation Skills* – Evaluation skills involve justifying and presenting and defending opinions by making judgments about information, validity of ideas or quality of work based on set criteria.

TEACHING AND LEARNING STRATEGIES

Technology & Industrial Arts emphasises and embraces the use of cognitive, reasoning, decision-making, problem solving and higher level thinking skills to teach to enhance students' understanding of inter-disciplinary concepts and issues in relation to environment, geography, history, politics and economic within PNG and globally.

It aims to provide a meaningful pedagogical framework for teaching and learning essential and in demand knowledge, skills, values, and attitudes that are required for the preparation of students for careers, higher education and citizenship in the 21st century.

Students must be prepared to gather and understand information, analyse issues critically, learn independently or collaboratively, organise and communicate information, draw and justify conclusions, create new knowledge, and act ethically.

Teaching and learning is a two-way interactive interaction between teacher and a student, a student to a student/students and occurs in any learning environment in or outdoors depending on the nature of teaching strategies learning activities and performance assessments teachers plan to use in the delivering of the lesson.

Technology and Industrial Arts teaching and learning takes on a **blended perception and practices** of its content delivering with envisioning intentions to reinforce evidence based learning. It embraces these in the classrooms whereby each technology strand content in the form of content standards, benchmarks and performance standards direct or determine the planning of the types of learning situations and activities, assessments throughout the school year.

These standards, including the specific knowledge skills and attitudes, how they are planned for students learning and performance attainment purposes in the respective grade levels are through highly commended teaching, learning and assessing strategies. For example; using blended learning strategies. This is where/when the traditionally recognised strategies (teacher centred) is blended with using e-teaching/learning strategies (online using smart phones) to learn about properties of fabrics, in a Textile Technology strand lesson.

Teaching strategies

Find listed for your convenience are identified teaching strategies commended for TIA subject lesson deliveries lessons However teachers can blend these in with the existing or current teaching practices using technology.

- Use of multimedia for content research.
- Utilisation of social media for fact finding on particular technology.
- Using variety of resources for meaningful teaching.
- Making most of games in electronic devices for learning.
- Use technology to empower students and reach out..

Learning Strategies

These are suggested learning strategies that can be used across the learning of all the five content strands in TIA subject.

1. Using multiple types of instructional materials for learning.
2. Incorporate technology for reinforcement and motivation for learning.
3. Try new learning techniques.
4. Keep your traditional methods.
5. Vary your assessments.
6. Mix up group work styles.
7. Try a digital curriculum.

Classroom assessment strategies

Find for your convenience suggested assessment strategies to assess technology curriculum content.

- Clarifying learning intentions and criteria for success.
- Engineer effective classroom-based questioning and discussions on performance tasks that provoke or draw out evidence of learning.
- Constantly provide feedback that move learners forward.
- Present or address students as instructional resources for each other.
- Computer assisted video-based test.

All Teachers teaching TIA from grades 9-12 are encouraged to also add to this list for the good of their students learning.-

TIA Classroom

This classroom will be a learning environment prepared especially for the teaching and learning of TIA subject. As we are moving through the 21st century technology era TIA classrooms must reflect a shadow image to encourage the teaching and learning of all the strands in the subject content.

It is suggested that teachers and students could work together to ensure that this technology classroom tips could be accommodated. These are;

- Regularly keep updates on new advancements in technology.
- Ongoing effective evaluation on an ongoing Basis.
- Make technology a treat & not an expectation.
- Monitor closely usage of electronic devices.
- Set ground rules for all.
- Share knowledge on how to get technical support.
- Communicate with parents.
- Familiarise yourself with the technology First aid.
- Use of technology by students.

These teaching and learning strategies will help teachers to;

- familiarise themselves with different methods of teaching in the classroom;
- develop an understanding of the role of a teacher for application of various methods in the classroom

Successful teachers always keep in view that teaching must “be dynamic, challenging and in accordance with the learner’s comprehension. He/she does not depend on any single method for making his/her teaching interesting, inspirational and effective”. *Please find a list of the different teaching and learning strategies in the Appendix.*

These strategies;

- make learning more engaging.
- make learning more effective.
- make learning fun.
- encourage higher motivational level.
- improve attention spans.
- develop higher order thinking and reflective skills.
- improve communication skills.
- develop the spirit of teamwork /collaboration.
- develop leadership skills and qualities.
- encourage discovery learning.
-

Therefore, teachers are encouraged to utilise the suggested strategies as well as others.

CURRICULUM INTEGRATION

What is Curriculum Integration?

An integrated curriculum is described as one that connects different areas of study by cutting across subject-matter lines and emphasising unifying concepts. Integration focuses on making connections and linkages in content for students, allowing them to see the importance of all subjects in the curriculum. When students are able to see and understand the linkages between different subject matter, they engage in relevant, meaningful activities that can be connected to real life.

Curriculum integration is a holistic approach to learning thus curriculum integration in SBC will equip students with the essential 21st century knowledge, skills, values and attitudes. Teachers must develop intriguing curriculum by going beyond the traditional teaching of content based or fragmented teaching to the teacher who is knowledge based and who should be perceived as a 21st century innovative educator.

There are three approaches that SBC will engage to foster conducive learning for all children whereby they all can demonstrate proficiency at any point of exit. Adapting these approaches will have an immense impact on the lives of these children as they will not only see themselves as catalyst of change for a competitive PNG but also, comparable to the world standards as global citizens.

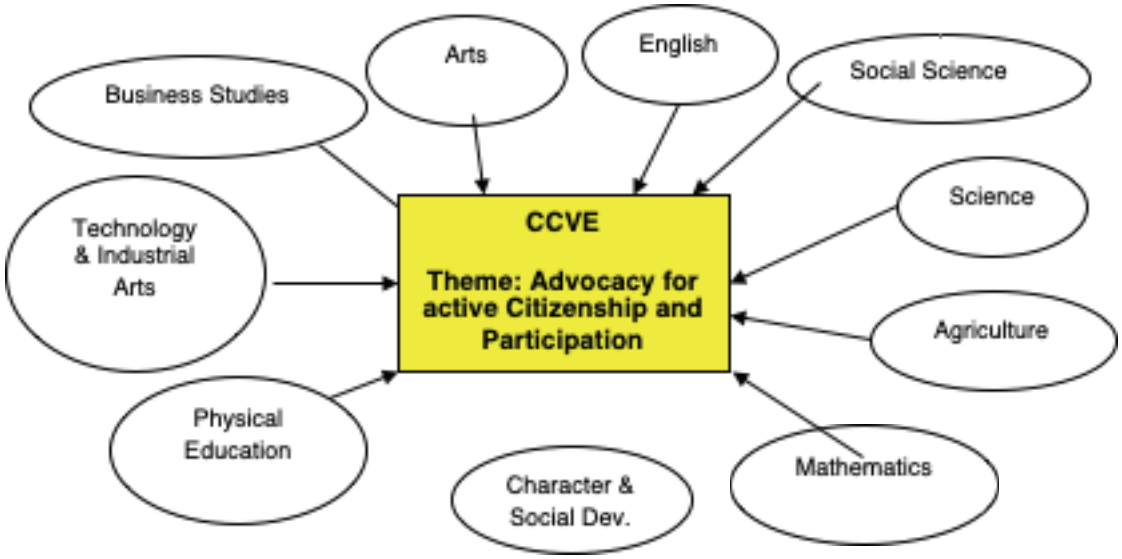
Engaging these three approaches in our curriculum will surely sharpen the knowledge and ability of each child, allowing them to see themselves as assets through their achievements and as agents of change contributing meaningfully to their country.

Integrated learning will bear a generation of knowledge-based populace who can solve problems and make proper decisions based on evidence. Thus, PNG can achieve its goals like the Medium Term Development Goals (MTDG) and aims such as the Vision 2050 for a happy, healthy and wealthy society whereby, all its citizens should have access and fair distribution to income, shelter, health, education and general good and services improving the general standard of living for PNG in the long run.

(i) Multidisciplinary Approach

In this approach, learning involves a theme or concept that will be taught right across all subject area of study by students. For instance, if the theme is “Advocacy for active Citizenship and Participation”, all subject areas create lessons or project-based learning and assessment as per their subjects around this theme.

The content of the theme ““Advocacy for active Citizenship and Participation” will be taught right across all the different subjects through the different Benchmarks as shown in the diagram and table below.



Sample Curriculum Integration Outline of Linkages

THEME: "ADVOCACY FOR ACTIVE CITIZENSHIP AND PARTICIPATION"		
SUBJECT: CHRISTIAN AND CITIZENSHIP VALUES EDUCATION **GRADE: 12**		
STRAND 3: CHRISTIAN CITIZENSHIP AND SOCIETY		
UNIT 1: Christian Civics Systems		
TOPIC: Christian civic organizations use technology to advocate for good health, better education and for protection of the natural environment and its sustainability.		
Subject	**Benchmark**	**Concept of focus to learn and assessed for the Theme**
CCVE	**12.3.1.4** Inquire and discuss how Christian civic Organizations use technology to advocate for good health, better education and for protection of the natural environment and its sustainability.	How Civic Organizations use technology to advocate for protection of the natural environment and its sustainability
Agriculture	**12.3.1.4.3** Suggest ways for improving problems that a□ect conservation in Papua New Guinea	Improving Conservation problems in PNG as Citizens
Arts	**12.3.3.2** Conduct research and create artworks to advocate for social change. **12.1.2.2** Use a range of techniques and technological tools in a variety of applications relating to music to communicate a theme.	Use data from research to create artwork to advocate for active Citizenship Use Music Technological Tools to communicate active Citizenship
Business Studies	**12.4.2.9.** Establish the e-business by creating a website or using a mobile application (apps) using the Apple operating system (App Store) or Google Android operating system (Google Play).	Create a website or a mobile application to as a platform to advocate for active Citizenship[p

Character and Social Development		
English	**12.2.6.2**: Take advantage of technology's capacity to link to other information and to display information flexibly and dynamically. **12.5.4.2:** Give a clearly articulated, well-structured presentation on a complex topic.	How to display Citizenship information flexibly and dynamically with use of technology. Do a clearly articulated, well-structured presentation on active Citizenship
Mathematics	**12.4.4.3** Use appropriate technology to aid concept development as a tool for problem solving. (General Maths) **12.1.1.5** Apply quadratic equations to solve real-world situations and complex number problems. (Advance Math)	Application of quadratic equations to solve real-world situations as part of active citizenship Use appropriate technology as a tool for problem solving when they engage as active citizens in real life situations
Physical Education	**12.2.2.2** Distinguish and illustrate sporting greats of PNG in respect to their contribution in the country	How they can actively participate as sporting greats to model active citizenship participation
Science	**12.2.1.6** Investigate human population growth by comparing recent and future population growth in developed and developing countries (Biology)	Use of data from investigations to compare human population growth and use the information to participate in informed decision making
Social Science	**12.1.4.6.** Critique various national and global strategies, agenda, and actions for addressing climate change. (Geography) **12.2.4.2.** Examine the different ways the United Nations promote change and maintain stability in different regions of the world. (Political Science) **12.3.3.1** Identify and appraise the different ways people from different cultures, religions, and ethnic and ideological backgrounds relate to each other (History)	Use of strategies to actively participate in addressing climate change Understanding of how UN maintains stability to be able to actively advocate for understanding of world peace Learn how common grounds of understanding and relationships minimizes differences in cultures, religions, and ethnic and ideological backgrounds and advocate for tolerance
TIA	**12.5.2.4;** Describe the characteristics of client site scripting and creating interactive menus (Computer Tech)	The use of site scripting to create interactive menus for advocacy on issues of national and global interest as part of active citizenship participation

Note: Assessment Project Planning for the theme

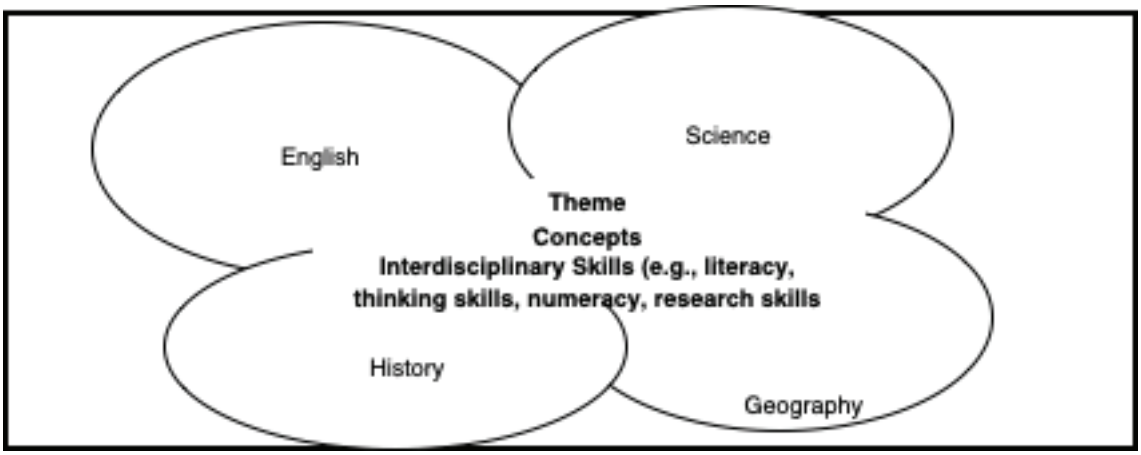
Planning for assessment will be a collaborative effort of all the subject teachers who wish their students to be part of the project with the CCVE subject Teacher as the overall coordinator of the Project and leading the Team. See the process of this assessment in the Assessment Section.

(ii) Interdisciplinary Approach

This approach addresses learning similarly to the multidisciplinary approach of integrated learning whereby learning takes place within the subject area. It is termed interdisciplinary as the core curriculum of learning is interwoven into each subject under study by the students. For instance; in CCVE, under the strand “Governance and Leadership” students will learn the different types of leadership and common governance principles cut across the different leadership styles they will learn.

Apart from learning these, students learning in CCVE are expected to use the application of writing, speaking and communication presentation skills in writing text types in their essay, such as argumentative essay, informative, explanatory, descriptive, expository and narrative essay, oral presentations and speech delivery in debates, advocacies and awareness campaigns. They must be able to capture the mechanics of English skills such as grammar, punctuation etc... Though these skills are studied under English, they are considered as core skills that cut across all subjects under study.

Therefore, essential knowledge, skills, values and attitudes comprising the core curriculum are interwoven and provide an essential and holistic framework for preparing all students for careers, higher education and citizenship in this learning.



(iii) Intra-disciplinary approach

This approach involves teachers integrating sub-disciplines within a subject area. For instance, within the subject CCVE, the four different strands will all be captured studying a particular content for CCVE. For example, under the Civic Systems and Principles, students will learn about civic different identities of different contexts and their participation likewise in the other 3 strands. Thus, children are well aware of their responsibility in active civic participation.

(iv) Trans-disciplinary Approach

In this approach learning goes beyond the subject area of study. Learning is organised around students' questions and concerns. That is, where there is a need for change to improve lives; students develop their own curriculum to effect these needs. The Trans-disciplinary approach addresses real-life situations thus gives the opportunity to students to attain real life skills. This learning approach is more to do with Project–Based Learning also referred to as problem-based learning or place-based learning.

The three steps to planning project-based curriculum (Chard 1998).

1. Teachers and students select a topic of study based on student interests, curriculum standards, and local resources.
2. The teacher finds out what the students already know and helps them generate questions to explore. The teachers will also provide resources for students and opportunities to work in the field.
3. Students share their work with others in a culminating activity. Students display the results of their exploration and review and evaluate the project.

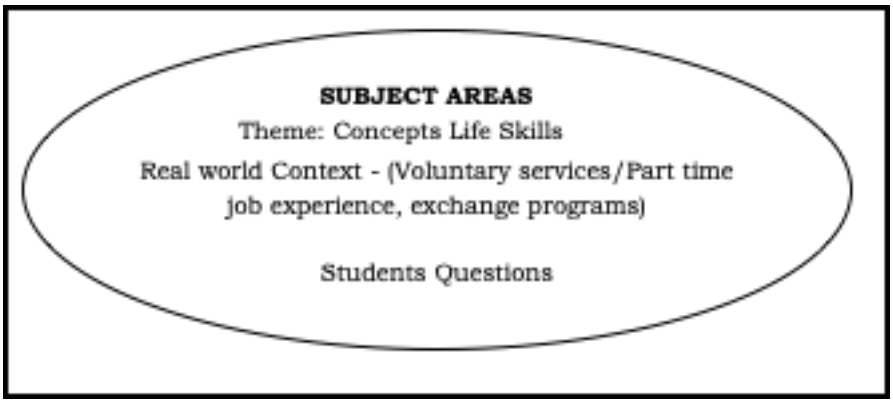
For instance; students may come up with slogans for school programs such as 'Our culture– clean city for a healthier PNG'. The main aim could be to curb betel nut chewing in public areas especially around bus stops and local markets. Here, students draw up their own instructions and criteria for assessment which is, they have to clean the nearest bus stop or local market once a week throughout the year. They also design and create posters to educate the general public as their program continues. They can also involve the town council and media to assist them especially to carry out awareness.

Studies (Susan M. Drake and Rebecca C. Burns) have proven that Project based-programs achievements have led to the following:

- Students go far beyond the minimum effort.
- Make connections among different subject areas to answer open-ended questions.
- Retain what they have learnt.
- Apply learning to real-life problems.

- Have fewer discipline problems.

Lower absenteeism (Curtis, 2002).



These integrated learning approaches will demand for teaches to be more proactive in order to improve students learning and achievements. In order for SBC to serve its purpose fully, these three approaches must be engaged for better learning for the children of Papua New Guinea now and in the future.

Strands, Units and Topics

This section of the teacher guide contains the Technology & Industrial Arts content to be taught in grade 11 to 12. It consists of;

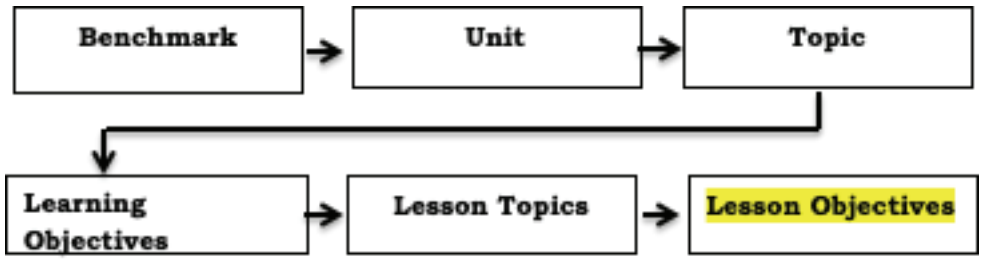
- a brief explanation of how the topics, learning objectives and lesson topics are derived.
- an overview of the content distributed according to the four terms in an academic year;
- the unit of work per strand **Technology & Industrial Arts** is organized around five main strands – Textile Technology, Food Technology, Construction Technology, Communication Technology and Computer Technology.

These strands encompass the content that students are expected to learn and master at each grade and school level. National content standards are benchmarked at each grade level, which allows for essential KSAV's to be reinforced and expanded throughout the grades. Benchmarks show grade level expectations of what students are able do to demonstrate that they are making progress towards attaining the content standard.
These grade-level benchmarks were then unpacked to identify the topics, learning objectives and the lesson topics. Below is a description of how topics were derived from the grade-level benchmarks.

Identifying topics from benchmarks

In order to identify the topic from the benchmark, we need to unpack the benchmark. When we unpack a benchmark, we are identifying what students will know and be able to do when they have mastered the benchmark.

1. Write out the benchmark that you want to unpack.
2. Write the verbs (skills/actions) – Higher order thinking skills
3. Underline or highlight the big idea (content) in the benchmark. The big idea (content) is the topic derived from the benchmark.
4. Write essential questions that would be engaging for students
5. Develop sub-topics from the big idea (topic)
6. Write learning objectives according to the sub-topics
7. Write lesson topics from the learning objectives



Teaching and Learning Concepts and Contents

The table below provides the teachers with what will be taught under each of the four strands in a year. Teachers will use this to develop their own yearly programs by organising these into terms. A sample is provided for teachers to use.

Subject Content - Technology & Industrial Arts

The strand Textile Technology is the first strand in the subject Technology and Industrial Arts (TIA). The overviews given in this guide will provide teachers with a general view of both the subject and the strand if the syllabus is not available.

- **Subject Overview**

Strand	Unit	Content Standard
1. Textile Technology	**1. Fibres and Fabrics**	1.1 Investigate the evolution, characteristics, designs and trends of fabrics and fabric designs, their construction, production, representation, regulation and marketing. Integrate and apply principles and techniques in presenting fashion ideas and illustrations in pattern making and garment construction for a variety of needs and occasions. Integrate
	2. Textile and Clothing	1.2 Integrate and apply principles and techniques in presenting fashion ideas and illustrations in pattern making and garment construction for a variety of needs and occasions.
2. Food Technology	**1. Food and Nutrition**	2.1 Examine and analyse the characteristics and properties of different types of food and the social, economic, political cultural and technological influences on their production and compliance with ethical principles and standards
	2. Food Science	2.2 Investigate and analyse the cultural, physical, chemical, nutritional, biological and sensory characteristics of food and how they influence the development and production of food

3. **Construction Technology**	**1.** **Building** **Technology**	3.1 Investigate the history and theory of buildings and analyse the components and system of buildings occupational health and safety procedures the properties of building materials and the processes in which those materials and equipment and are used according to industry standards.
	2. **Electrical** **Technology**	3.2 Analyse and apply the technological processes, concepts, principles, and practices related to Electrical Technology and its social contribution, with regard to economic growth, entrepreneurship, sustainability and as a tool for change, improving the quality of life responsive to individual, community and industrial needs
	3. **Plumbing** **Technology**	3.3 Investigate and analyse fundamental concepts of plumbing theories, Occupational health and safety regulations and standards, trade drawing , demonstrations and applications of tools and materials specifications instillation of plumbing fittings and accessories of drain, waste and vent(DWV)system, and water distribution system.
	4. **Welding** **Technology**	3.4 Investigate and analyse safety procedures print reading measurement and layout, identify properties of metals the welding techniques, cutting processes according to welding codes, inspections, testing principles and apply foundations of fabrications.
	5. **Engineering** **Technology**	3.5 Investigate and analyse historical and societal influences in Engineering by understanding the engineering principles, practices, the design processes, the management, problem solving and communication skills appropriate to any engineering field.

4. Communication Technology	1. **Data Communication and Network**	4.1 Investigate and analyse communication technology utilising multimedia and the practices and the systems in designing, installing configuring and managing networks.
	2.Computer Security and safety	4.2 Investigate and analyse ergonomics social and ethical issues, and the development of a monitoring and control system for both hardware , software, and information security in society
5. Computer Technology	1. Computer Architecture	5.1 Explore and analyse computer fundamentals the skills to manage and maintain diagnose, trouble shoot, and solve issues that encompass computer, systems networking interfacing and programing as well as electronics and robotics and be aware of related environment and social issues
	2. Computer Software	5.2 Investigate and analyse computer systems and application, software, programing, algorithm, web design and databases, and develop and apply the skills and knowledge in the various software

STRAND: TEXTILES TECHNOLOGY

Content Overview for Unit 1 Fibres and Fabrics

CS1.1 Investigate the evolution, characteristics, designs and trends of fabrics and fabric designs, their construction, production, representation, regulation and marketing.

Units	Benchmarks	Topics	Lesson Titles
Fibres and Fabrics	11.1.1.1 – Display the processes of the fashion design, construction, production and marketing of textiles and clothing.	Textile Design, Production and Marketing	1.Process of fashion design in textile and clothing 2. Production processes of textile and clothing 3. Marketing processes of textile and clothing products.
	11.1.1.2 – Analyze social, economic, cultural, environmental and technological factors influencing consumer selection of textiles and garments.	Factors Influencing Consumer Selection of Textiles and Garments.	1. Climatic and Occasional Factors. 2. Age and Profession Factors.
	11.1.1.3 – Distinguish the various physical, thermal, chemical and biological properties of fabrics.	Textile Consumerism and Awareness	1. Physical and thermal properties of fabric. 2. Chemical and biological properties of fabric.
	11.1.1.4 – Explore and describe a range of fabric construction processes in patterns, garments and accessories.	Fabric Construction Processes	1. Pattern construction and garment construction processes 2. Accessories construction processes
	11.1.1.5 – Investigate and outline the regulation of the construction of fibres and marketing of fabrics and fabric design.	Regulations in the Textile Industry	1. Regulation in the Textile Industry. 2. Assessment criteria and technical work.

UNIT 1: Fibres and Fabrics

Content Standard 1.1; **Investigate the evolution, characteristics, designs and trends of fabrics and fabric design, their construction, production, representation, regulation and marketing**

Benchmarks 11.1.1.1 **Display the process of the fashion design, construction, production and marketing of textiles and clothing.**

TOPIC 1: Textile Design, Production and Marketing

Essential Questions:

1. What is Fashion design?
2. What are the steps in the production process?
3. How are the textile and clothing products marketed?
4. Where are they being marketed?

Essential Knowledge Skills, attitudes and values

Knowledge	Process of fashion design, construction production and marketing
Skills	Display, exhibit, show team mates a fashion design process.
Context	Marketing
Attitudes/Values	Critical thinking, creative self-determination, Inventing

Technology and Industrial Arts Application: Textiles Technology: Fibres and Fabrics

Learning Objectives

By the end of this topic, the students will be able to;

1. Define fashion design
2. Research and display the production processes of textile and clothing
3. Investigate and describe the processes involved in marketing textile and clothing

Content Background

Textile Design, Production and Marketing.

Textile items or products are referring to artifacts (clothing or household) made by weaving, felt or knitting or crocheting natural or synthetic fibres. (Advanced English Dictionary). Textile design is essentially the process of creating designs for woven, knitted or printed fabrics or surface ornamented fabrics. Textile designers are involved with the production of these designs, which are used, sometimes repetitively, in clothing and interior decor items adapt from Wikipedia.

Production process

Production processes begin from the conversion of fibres into yarns and then fabrics. The fibres are twisted or spun into yarn; yarns are woven, knitted or matted/felt into fabric. Weaving is the most common method of making fabrics and there are three types; plain weave, twill weave and the pile weave. Production method also depends on the type of fibre and the kind of textile product desired. That process is progressed through:

Twisting *weaving* *sewing*
FIBRES → *YARNS* → *FABRIC* → *TEXTILE*

Item/Product

Spinning *knitting* *crocheting* *Matting* *knitting etc.*

Process of fashion design

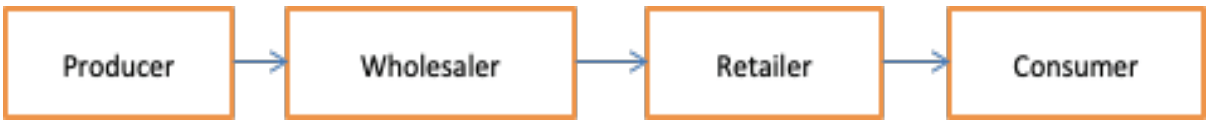
Fashion according to Wikipedia is a popular style or practice, especially in clothing, footwear, accessories, makeup, body piercing or furniture. Fashion is a distinctive and often habitual trend in the style in which a person dresses. Fashion design as defined by the Wikipedia is; the art of applying design aesthetics and natural beauty to clothing and its accessories.

Design processes are done to respond to needs and opportunities that arise. The basic steps in design process source: discovery.org)

Design process is also affected by the elements of design.*(reffer to gr. 9 notes)*

Marketing process of textile and clothing.

Marketing as defined by the Advance English dictionary is the commercial process involved in promoting and selling and distributing a product or service. Marketing creates the desire for consumption of new designs as close as possible to the point of creation, adapt from Wikipedia. This is achieved by promoting fashion consumption as something fast, low price and disposable. [2] Like all products, once the production process is complete it is distributed for sale and consumption. Products undergo the chain of distribution that is:



Teaching and Learning Strategies

Teachers are encouraged to introduce students to simulations to better understand the concepts taught. Therefore, students will learn effectively and master the knowledge prescribed in each topic. Whilst introducing the topic, guided discovery and research will enable students to get a picture of fibres and fabrics. The knowledge prescribed must be taught. It is not only about teaching what students should know but also to interpret that knowledge for students in a way that makes it relevant to them, and enables them to begin to acquire skills of analysis and problem solving, which will support teaching and learning. Students must be given opportunities to apply their knowledge, to be creative and to solve problems.

Lesson 1: Define fashion design

Teaching Strategies

Teacher will identify and elaborate on concepts of fashion and fashion design.

Learning Strategies

Students in groups discuss and outline concepts of fashion and fashion designs. They are then encouraged to research on the above concepts guiding them into defining fashion design.

Activity 1

In groups, discuss and list important aspects or concepts of fashion designs and textiles.

Activity 2

Carry out research and investigation on the process of fashion designs in textile and clothing.

Activity 3

Present findings indifferent forms such as drawings, sketches, models etc.

Resources

https://www.discovery,org
Advanced English Dictionary

Lesson 2: Production processes of textile and clothing

Teaching Strategies

Engage students in investigating local and international fibre to fabric construction processes.
Allow students to present findings and do report write up on their findings.

Learning Strategies

Discover the different processes involved in the production process of textile and clothing.

Activity 1

Investigate local and international fibre to fabric construction processes.

Activity 2

Compile findings and present the common production processes of textile and clothing

Activity 3

Compile a scrap book on the production process of local fibre to fabric construction process.

Resources
https://www.discovery,org
Advanced English Dictionary

UNIT 1: Fibres and Fabrics

Content Standard 1.1; **Investigate the evolution, characteristics, designs and trends of fabrics and fabric design, their construction, production, representation, regulation and marketing.**

Benchmark 11.1.1.2; **Analyze social, economic, cultural, environmental and technological factors influencing consumer selection of textiles and garments.**

TOPIC 2: Factors Influencing Consumer Selection Of Textile and Garments.

Essential Questions:

1. How do climatic factors influence consumer selection?
2. How does occasion influence consumer selection?
3. How does age influence consumer selection?
4. How does profession influence consumer selection?

Essential Knowledge Skills, attitudes and values

Knowledge	Consumer selection of textiles and garments
Skills	Analyze, examine in detail, and break down information
Context	Social, economic and cultural
Attitudes/Values	Empowerment, open minded and respect

Technology and Industrial Arts Application: Textiles Technology: Fibres and Fabrics **Learning Objectives**

By the end of this topic, the students will be able to;

1. List the factors influencing consumer selection of textile and garments.
2. Discuss how these factors influence consumer selection of textile and garments.

Content Background : Factors Influencing Consumer Selection- Textile and Garments.

The clothes that you choose to buy and wear are influenced by several factors such as climate, age, occasion, activity and occupation. This selection of garments or textile products as an individual or for a family, a certain group of people in a field, same age and of employment or corporation

1. Climatic Factors

You wear cottons in summers and woollens in winters. As you know woollen clothes are expensive and proper care is needed for their maintenance. People living in cold climate need to wear woolen clothes to keep warm. People living in very hot climates as in desserts need to wear turbans of thick cloth to protect their heads and wear long robes to stay cool.

2. Occasion

When you are attending a marriage you wear dresses in bright colours like lehnga cholis, ghagras and shararas often accompanied by bright accessories like bangles, chain and earrings. Do you think these elaborate dresses could be worn on busy routine days? You would rather feel comfortable in a dress which fits you well and allows for ease of movement. Simple clothing with minimum accessories like a formal salwar kameez will give a more professional look for an interview. Sari, formal trousers, shirt, tie would be a good option that will make you feel active and confident.

3. Age

You must have noticed that the type of clothes worn change with age. Clothes worn by an adult–woman are definitely not the same as those worn by a college going girl. Similarly, men will prefer to wear light and comfortable clothes rather than fashionable ones. Let us see how the type of clothes worn change with age.

Infant Wear

The clothing requirements from birth to 12 months of age are few. The major requirements of the newborn are for warmth, comfort and cleanliness. Clothes should be soft and light as babies have tender and delicate skin. Since they are sleeping most of the time their clothes should be simple to put on and take off. It is also important that they should be easy to maintain.

Cotton shirts that slip on or that have double-breasted front opening with snaps are some easy to wear styles. The diapers should be made of absorbent and soft cotton material.

School going children

Children of this age group are in the growing stage. They like to run about and play and are very active. Hence, their clothes must be made of strong and durable fabrics which can take a lot of wear and tear.

While selecting, do take care to see that there is adequate cloth inside the seams which can be opened up to fit rapidly growing children. The clothes must also be easy to launder as they get dirty frequently. The later Teen Years–is when one starts going to college. Teenagers are very conscious about clothes and want to wear the 'latest' styles. They like to have variety in their clothes because they do not want to repeat the same dress every day. For them, fit and style are important qualities of clothes and construction is not often considered.

It is advisable to select clothes which they can mix and match so that they can achieve variety with few clothes e.g. few colours of churidars or salwars can be combined with few 'Kameez' which can go with all legwears. Similarly, if a teenager boy gets a couple of pair of jeans and a few T-shirts, he can combine them to achieve variety in his wardrobe.

Adults–Selection of clothes for adults depends to a large extent upon the type of work that a person is engaged in. A working woman will need clothes which are easy to launder and which do not need much ironing because she has very limited time. She will also prefer to wear clothes which do not easily wrinkle as she must look good till the end of the day. Do you remember which the fabrics which do not wrinkle easily are?

Old age - Old age brings its own problems. The body becomes stiff, the eye sight becomes weak and energy level is considerably reduced. You must have also observed that normally old people wear light material. The clothes they wear must be loose and comfortable rather than fashionable. Also, it would be advisable for the clothes to have front openings which are easy to see and manipulate and large buttons and button holes.

4. Profession / Occupation

You must have seen doctor and nurses in white or light coloured simple clothing. Such a dress gives a neat and clean look to the wearer and also has a soothing effect on the patient. What is the uniform of a soldier? Many professions have a specific dress code which gives them a special identity for example people working in the hotel industry, airlines, traffic policemen, security guards and so on.

Sportsmen especially athletes and tennis players wear tiny shorts and snug tops of highly absorbent fabric. Such a dress may look out of place when worn on other occasion. Similarly, a swim suit would look appropriate only near a swimming pool. Clubs, hotels and often formal parties have their own dress regulations.

What kind of clothes should you wear when you have to take a long bus or train journey? Clothes for travelling should preferably of dark colours and should not crumple easily. Certain specialized activities require special apparel for example special overalls are worn in the laboratory, during mixing chemicals for pest control by people or by those who work in nuclear power plants. They protect the workers against radiation hazards.

Workers in mines wear mining suits and special helmets fitted with torches. Divers wear wet suits with slippers that help them move easily under water. Do you know astronauts wear space suits fitted with total life support system to sustain and protect them from the harmful effects of outer space? Firemen wear apparel made of fireproof fabrics. What should you wear while working in the kitchen? Yes, go in for snug cotton clothing. Avoid loose fitting clothes and hanging dupattas and shawls.

Teaching and Learning Strategies

Teachers are encouraged to introduce students to simulations to better understand the concepts taught. Therefore, students will learn effectively and master the knowledge prescribed in each topic. Whilst introducing the topic, guided discovery and research will enable students to get a picture of fibres and fabrics. The knowledge prescribed must be taught. It is not only about teaching what students should know but also to interpret that knowledge for students in a way that makes it relevant to them, and enables them to begin to acquire skills of analysis and problem solving, which will support teaching and learning. Students must be given opportunities to apply their knowledge, to be creative and to solve problems.

Lesson 1: Climatic Factors and Occasion

Teaching Strategies

Delivery of these lessons will use enquiry approach in teaching. Guide questions to establish a starting point and lead into taking on the activities.

Learning Strategies

Student are given the opportunity to explore and conduct simple research and decide on the best method to either individually or in pairs or small groups of 3 to work on the assigned activities for each lesson title.

Activity 1

In 3 sentences each, describe how ‘climate and occasions’ your selection as a consumer of textile and garments.

Activity 2

State true or false and correct the false statement.

1. Synthetic fibres are ideal for babies under garments.
2. Doctors wear white coats to look fashionable.
3. Clothing for travelling should preferably be of light colours.
4. Delicate fabrics like silk are ideal for a long train journey.
5. Cotton shirts that are easy to slip on or that have double breasted front openings with snaps are some easy to wear styles for infants.

Resources

https://www.nios.ac.in/media/documents/srsec321...

Lesson 2: Age and Profession (Occasion)

Teaching Strategies

Delivery of these lessons will be in the enquiry approach in teaching. Teacher guided questions to establish in the students a starting point and guide them into achieving the objectives in the identified lesson topic.

Learning Strategies

Student are given the opportunity to explore and conduct simple research and decide on the best method to either individually or in pairs or small groups of 3 to work on the assigned activities for each lesson title.

Activity 1

In 3 sentences each, describe how 'age and profession' your selection as a consumer of textile and garments.

Activity 2

Match column I with column II

Column I	Column II
1. Baby garments	a) variety to mix -n- match
2. Teenagers	b) denim
3. Active children	c) made of absorbent cottons
4. School going children	d) glamorous
5. Grandmother	e) strong and durable
	f) bright clothes
	g) dresses with front opening

Resources

https://www.nios.ac.in/media/documents/srsec321...

UNIT 1: Fibres and Fabrics

Content Standard 1.1 Investigate the evolution, characteristics, designs and trends of fabrics and fabric design, their construction, production, representation, regulation and marketing

Benchmark 11.1.1.3 Distinguish the various physical, thermal, chemical and biological properties of fabrics.

Topic 3: `Properties Of Fabric

Essential Questions:

1. What are physical and thermal properties of fabric?
2. What are chemical properties and how it affects fabric products?
3. What are the biological properties and how it affects fabric product?

Essential Knowledge Skills, attitudes and values

Knowledge	Various properties of fabric
Skills	Distinguish, differentiate and compare
Context	Types of fabrics
Attitudes/Values	Appreciate, Value/ adapt

Technology and Industrial Arts Application*:* Textiles Technology: Fibres and Fabrics

Learning Objectives

By the end of this topic, the students will be able to;

1. Differentiate the physical and thermal properties of fabric
2. Describe the chemical properties of fabric
3. Identify and explain biological properties of fabric

Content Background Properties of Fabric

Properties of fabrics refer to the characteristics or features or qualities of the fabric. The properties of the fabrics are actual properties of the fibres by which they were made from. Most fabrics fall into two categories when it comes to their construction properties; woven and knitted, adapted from contrado.com.

Physical properties of Fabrics

Physical properties are the static physical dimensions of fabric. The following physical properties are used to define the static physical dimensions of strand fabrics:

- Fiber or filament: type, size, length
- Yarn: diameter, twist, weight or size, count, fiber content for mixed yarns, ply.
- Weight: ounces per squared or yards per pound.
- Thickness: vertical depth.
- Fabric structure
- Woven fabrics: weave type, warp and filling yarn count per linear inch
- Knitted fabric: knit type, wale and course count per inch
- Finishes: chemicals such as resins, starches, waxes and mechanical effects such as
- Calendaring and napping applied to the woven fabric to yield or enhance style, durability, and utility values.
- Fabric width: The length of the filling or course
- Color: Hue, value, and intensity (degree of brilliance)
- Fabric density: weight per unit of volume.
- Surface contour: the geometric dimension of the surface plane.

1. Physical characteristics of fabrics

Physical characteristics are the dynamic physical parameters of fabric. They are physical changes in the fabric that result from applying outside forces on the fabric. Most of the durability and utility values of fabric are characteristics and not properties. There are four major categories of fabric characteristics that interest the apparel manufacturer. They are:

* Style characteristics
* Utility characteristics
* Durability characteristics
* Product production characteristics

There are often correlations among the four types of characteristics. A utility characteristic such as fabric elongation will be correlated to a working character Stylistic such as sewing without stretching. (**Source Adapted from textileschool. com.)** (https://www.textileschool.com)

2. Thermal properties

Thermal is relating to or caused by heat or by changes in temperature. (Wikipedia). Thermal is used for different clothing. This means the clothing which feels cool in warm weather and warm in cool weather when worn. (adapt contrado.com)

3. Chemical and Biological properties of fabric

The chemical and Biological properties of fabric depend on the composition of the fabric, that is; the fiber in which they were made from. Therefore, chemical and biological properties of fibers like cotton, wool, nylon etc.

Teaching and Learning Strategies

Teachers are encouraged to introduce students to simulations to better understand the concepts taught. Therefore, students will learn effectively and master the knowledge prescribed in each topic. Whilst introducing the topic, guided discovery and research will enable students to get a picture of fibres and fabrics. T

he knowledge prescribed must be taught. It is not only about teaching what students should know but also to interpret that knowledge for students in a way that makes it relevant to them, and enables them to begin to acquire skills of analysis and problem solving, which will support teaching and learning. Students must be given opportunities to apply their knowledge, to be creative and to solve problems.

Lesson 1: Physical and thermal properties of fabric

Teaching Strategies

Delivery of these lessons will be in the enquiry approach in teaching. Teacher guided questions to establish in the students a starting point and guide them into achieving the objectives in the identified lesson topic.

Learning Strategies

Student are given the opportunity to explore and conduct simple research and decide on the best method to either individually or in pairs or small groups of 3 to work on the assigned activities for each lesson title.

Activity 1

Identify and list the physical properties of fabric

Activity 2

Define thermal and explain what they are in relation to fabric

Resources

https://www.wikipedia.properties –of-fabric

Lesson 2: Chemical and biological properties of fabric

Teaching Strategies

Delivery of these lessons will be in the enquiry approach in teaching. Teacher guided questions to establish in the students a starting point and guide them into achieving the objectives in the identified lesson topic.

Learning Strategies

Student are given the opportunity to explore and conduct simple research and decide on the best method to either individually or in pairs or small groups of 3 to work on the assigned activities for each lesson title.

Activity 1

Investigate and list chemical properties in fabric

Activity 2

Demonstrate chemical reactions that affect fabric and construction methods

Resources

https://www.wikipedia.properties –of-fabric

Lesson 3: Biological properties of fabric

Teaching Strategies

Display a biological reaction (e.g. mould on clothes) on fabric to introduce biological properties of fabric.

Learning Strategies

Displaying of a cloth with a black mould forming on it will stimulate questions and discussions as to why it has appeared on the fabric or textile item.

Activity 1

Brainstorm exercise on defining biological properties of fabric.

Activity 2

Discuss how these properties affect or influence fabric construction.

Resources

https://www.wikipedia.properties –of-fabric

UNIT 1: Fibres and Fabrics

Content Standard 1.1 Investigate the evolution, characteristics, designs and trends of fabrics and fabric design, their construction, production, representation, regulation and marketing

Benchmark 11.1.1.4 Explore and describe a range of fabric construction processes in patterns, garments and accessories.

Topic 4: Fabric Construction Processes

Essential Questions:

1. What are the necessary requirements in pattern construction?
2. How are garments/fabrics made?
3. When and where does garment construction begin?
4. What are accessories?

Essential Knowledge Skills, attitudes and values

Knowledge	Processes in fabric construction
Skills	Explore and describe
Context	Garments and accessories
Attitudes/Values	Appreciating, openness, creativeness

Technology and Industrial Arts Application: Textiles Technology: Fibres and Fabrics

Learning Objectives

By the end of this topic, the students will be able to;

1. Investigate and identify various pattern construction techniques
2. Describe a range of garment construction processes
3. Define accessories and describe construction methods

Content Background Fabric Construction Processes

Fabric construction refers to the processes or methods in which fabrics are made. That is the conversion of fibres into yarns or fibres into fabric. Most fabrics are produced by the process of weaving and knitting.
Fabric construction methods are; weaving, knitting, matting, crocheting, macramé and embroidery, non- woven, braiding, nets and laces.

Pattern construction *(Drafting)*

Pattern is a hard paper which is made by following each individual component for a style of garment or apparel. Actually pattern is a template from which the parts of a garment are traced onto fabric before being cut out and assembled. **Pattern making** is a highly skilled technique which calls for technical ability, sensitivity for design interpretation and a practical understanding of **garment construction**. Pattern making is a bridge function between design and production. (source: clothingindustry.blogspot.com)

Pattern drafts are individual patterns made from own body measurements and drafts.

A basic or foundation pattern can be created by any of the two methods, namely, by drafting or by draping fabric on a model. Pattern drafting is defined as a technique or method of drawing patterns on brown paper with accuracy and precision, based on the body measurements or standard measurement chart. This is an efficient and economical method and can be manipulated to create the pattern for different styles by a technique known as flat pattern designing.

The tools required for pattern making are given below, based on the order of their usage (Figure-1).

1. Measuring devices (tape measure, T-square)
2. Drafting devices (drafting paper, pencil, square, ruler, eraser, French curve)
3. Marking devices (tailor's chalk)
4. Cutting devices (scissors)
5. Sewing devices (manual/electrical machines, needles)
6. Finishing or pressing devices (iron, ironing board)
7. Miscellaneous or general tools (pins, tracing wheel, thread unpicker)

Garment construction

Garment as defined by the Advanced English dictionary is an article of clothing. In other words garment simply refers to clothes. There different ways of constructing a garment. The most common method of construction will be sewing, knitting and crocheting. Textile industries have technologically advanced machines that construct garments in mass numbers.

Accessories

Accessory is clothing that is worn or carried but it is not part of your main clothing, by Advance English dictionary. It is worn to complement, contrast or match clothing that is worn, such as; hats, bags, shoes, jewellery etc.

Construction of accessories vary according to the type like bags are most sewn while necklaces are threaded or even under go complex techniques using technologically advanced equipment to construct them as in jewellery.

Teaching and Learning Strategies

Teachers are encouraged to introduce students to simulations to better understand the concepts taught. Therefore, students will learn effectively and master the knowledge prescribed in each topic. Whilst introducing the topic, guided discovery and research will enable students to get a picture of fibres and fabrics.

The knowledge prescribed must be taught. It is not only about teaching what students should know but also to interpret that knowledge for students in a way that makes it relevant to them, and enables them to begin to acquire skills of analysis and problem solving, which will support teaching and learning. Students must be given opportunities to apply their knowledge, to be creative and to solve problems.

Lesson 1: Pattern construction processes

Teaching Strategies

Delivery of these lessons will be in the enquiry approach in teaching. Teacher guided questions to establish in the students a starting point and guide them into achieving the objectives in the identified lesson topic.

Learning Strategies

Student are given the opportunity to explore and conduct simple research and decide on the best method to either individually or in pairs or small groups of 3 to work on the assigned activities for each lesson title.

Activity 1

The importance of patterns and how they evolve

Activity 2

Demonstrate simple to complex pattern drafting skills.

Resources

https://www.clothingindustry.blogspot.com

Lesson 2: Garment construction processes

Teaching Strategies

Delivery of these lessons will be in the enquiry approach in teaching. Teacher guided questions to establish in the students a starting point and guide them into achieving the objectives in the identified lesson topic.

Learning Strategies

Student are given the opportunity to explore and conduct simple research and decide on the best method to either individually or in pairs or small groups of 3 to work on the assigned activities for each lesson title.

Activity 1

Using the pattern in lesson 1, layout and cut the fabric.

Activity 2

Construct garment according to their pattern

Resources

https://www.clothingindustry.blogspot.com

UNIT 1: Fibres and Fabrics

Content Standard 1.1 **Investigate the evolution, characteristics, designs and trends of fabrics and fabric design, their construction, production, representation, regulation and marketing.**

Benchmark 11.1.1.5 **Investigate and outline the regulation of the construction of fibres and marketing of fabrics and fabric design**

TOPIC 5: Regulations In The Textile Industry

Essential Questions:

1. What is the government's regulation on textile industries in PNG?
2. Are there regulations governing fibre construction in PNG?
3. What are the Global regulations protecting Textile industries?

Essential Knowledge Skills, attitudes and values

Knowledge	Fibres construction, marketing of fabrics and fabric design
Skills	Investigate, outline, specify
Context	Marketing fabrics
Attitudes/Values	Appreciate the laws in fabric industries

Technology and Industrial Arts Application: Textiles Technology: Fibres and Fabrics

Learning Objectives

By the end of this topic, the students will be able to;

1. Investigate and outline fibre construction regulations
2. Research and identify marketing regulations of fabric
3. Explain Global regulations of fabric design and construction

Content Background

TOPIC 5: Regulations in The Textile Industry

Like any other organization, textile and clothing is guided by a set of rules and regulations under the UN (United Nations) called the Textile Regulations (EU) No 1007/2011. This was done purposely to protect consumer interest and eliminate fraudulent behaviours. In this lesson, we will specifically look at these regulations.

Textiles and Clothing Legislation

The EU has aligned laws in all member countries with Textile Regulation (EU) No 1007/2011 on fibre names and related labeling and marking of the fibre composition of textile products. This was done to protect consumer interests and eliminate potential obstacles to the proper functioning of the internal market.

What's in the Regulation?

The Regulation was adopted to ensure that citizens, businesses, and public authorities can readily identify their rights and obligations can readily identify their rights and obligations.

Background

As far back as the 1970s, the need to align legislation on textile names in Member States was recognised by the European Commission.

Differences in textile fibre names across Member States created a technical barrier to trade in the European single market and hindered consumer interests.

In 1971, a Directive was adopted to harmonise the names of textile products and their labelling on the items themselves and in marketing documents.

In 2006, the Commission decided to revise legislation on textile names again to introduce more flexibility to keep up with the technological developments expected in the industry. In 2009, the Commission adopted a proposal for a new regulation on textile names that would replace the Textile Directives.

The new Textile Regulation (EU) No 1007/2011 on textile fibre names and related labelling and marking of the fibre composition of textile products was adopted in September 2011 and became applicable on 8 May 2012. It repealed and replaced the previous Textile Directives

Applying for a new fibre name

Adding a new fibre name requires that there be some sort of amendment to the existing textile regulations. The European Commission will only initiate this process if the amendment appears inevitable due to the need to improve consumer information and/or the proper functioning of the European single market.

Applications may be submitted by manufacturers or a person on their behalf. A new name is justified only if the fibre cannot be classified into any of the existing groups.

Companies are advised to contact the relevant European industry federation before launching an application. While not formally required, it is helpful if the application is supported by the industry. It is also helpful if a request is supported by consumer organisations.

The Regulation does not foresee that a temporary fibre name will be granted during the transition period, pending the amendment of the Regulation. According to Article 9.5 of the Regulation, fibres not yet listed in Annex I may, however, be designated by the term ‘other fibres’.

Assessment Criteria and Technical Work

Each application and its technical file will be evaluated against the following criteria:

1. The fibre is radically different from other fibres by chemical composition and/or by fibre properties;
2. The fibre is detectable and distinguishable from other fibres by standardized test methods;
3. The fibre is commercially available from at least two independent producers;
4. A new generic name is justified as the fibre cannot be classified into an existing generic name.

When the applicant proposes one or more methods (applicable to mixtures of the new fibre with other fibres), which are not listed in Annex VIII of the Regulation, validation is required of the proposed new identification and quantification method(s). The purpose is to assess the quality and coherence of results obtained in different laboratories with the same test method(s).

If deemed necessary, samples of the fibre (yarns and/or fabrics) provided by the applicant will undergo a technical analysis of the proposed fibre parameters, such as agreed allowance, correction d factors for loss in mass (to be applied for each method) etc. The purpose is to assess whether the fibre is identifiable and distinguishable from other already existing fibres.

The main elements are*

- general obligation to state the full fibre composition of textile products;
- minimum technical requirements for applications for a new fibre name;
- requirement to indicate the presence of non-textile parts of animal origin;
- exemption applicable to customized products made by self-employed tailors;
- Empowerment of the European Commission to adopt delegated acts amending the technical Annexes of the Regulation, in line with Article290 of the Treaty on the Functioning of the European Union;
- Reporting on the implementation, review clause, and study on hazardous substances to be undertaken by the Commission.

Scope of Regulation 1007/2011

According to the Regulation, textile products have to be labeled or marked whenever they are available on the market.

The indication of the fibre composition of a product is mandatory at all stages of the industrial processing and commercial distribution of that product.

All products containing at least 80% by weight of textile fibres, including raw, semi-worked, worked, semi-manufactured, semi-made, and made-up products are covered by the Regulation.

The Regulation does not cover size, country of origin, or wash/care labeling.

Teaching and Learning Strategies

Teachers are encouraged to introduce students to simulations to better understand the concepts taught. Therefore, students will learn effectively and master the knowledge prescribed in each topic. Whilst introducing the topic, guided discovery and research will enable students to get a picture of fibres and fabrics.

The knowledge prescribed must be taught. It is not only about teaching what students should know but also to interpret that knowledge for students in a way that makes it relevant to them, and enables them to begin to acquire skills of analysis and problem solving, which will support teaching and learning. Students must be given opportunities to apply their knowledge, to be creative and to solve problems.

Lesson 1: Regulations in the Textile Industry

Teaching Strategies

Delivery of these lessons will be in the enquiry approach in teaching. Teacher guided questions to establish in the students a starting point and guide them into achieving the objectives in the identified lesson topic.

Learning Strategies

Student are given the opportunity to explore and conduct simple research and decide on the best method to either individually or in pairs or small groups of 3 to work on the assigned activities for each lesson title.

Activity 1

Brainstorm the concept “regulations in textile industry”. Record brainstormed views and discuss the importance and the function of the of the concept.

Activity 2

Identify strategies that fibre producers use to give the fibres name through the textile industry regulations

Resources

*https://***ec.europa.eu***/growth/sectors/fashion/***textiles***-clothing/legislation_en*

Lesson 2: Assessment Criteria and Technical Work

Teaching Strategies

Delivery of these lessons will be in the enquiry approach in teaching. Teacher guided questions to establish in the students a starting point and guide them into achieving the objectives in the identified lesson topic.

Learning Strategies

Student are given the opportunity to explore and conduct simple research and decide on the best method to either individually or in pairs or small groups of 3 to work on the assigned activities for each lesson title.

Activity 1

Define the the following phrases with a friend or in threes. Report to the class the group view and how they are applied in textile industries.

Assessment Criteria

Technical Work

Activity 2

Read the section 'Scope of Regulation 1007/2011, and answer the following questions

- List 2 negative points you have about this information
- List 2 positive points you have about this information.

As amateur fashion designer in the textile industry what is one thing you would like to change in this Scope of Regulation.

Activity 3:

Share your Reponses in class. May be you could decide on a class debate in the near future

Resources

https://ec.europa.eu/growth/sectors/fashion/textiles-clothing/legislation_en

STRAND: TEXTILES TECHNOLOGY

Content Overview for Unit 2: Textiles and Clothing

CS1.2 Integrate and apply principles and techniques in presenting fashion ideas and illustrations in pattern making and garment construction for a variety of needs and occasions

Unit	Benchmark	Topic	Lesson Titles
Textiles and Clothing	11.1.2.1. Evaluate the historical influences, technological progression and emerging trends as inspirational sources for design.	Evaluating the Sources of Design	1. Evaluating historical influences and technological progressions 2. Evaluating emerging trends
	11.1.2.2 Design a variety of garments incorporating the trends in fashion.	Elements of Design	1. Functions, Aesthetics, Shapes, Proportion and Colour.
	11.1.2.3 Apply appropriate principles and techniques in designing fashion ideas.	Finishing, Caring for and Maintaining Fabrics	1. Fabric finishes, Care and maintenance of Textile products. 2. Laundering processes.
	11.1.2.4 Present fashion ideas and illustrations in pattern and garment construction for specific requirements and occasions.	Famous Fashion Designers	1. Coco Chanel, Georgia Armani and Calvin Klein. 2. Donatella Versace and Rohit Bal.
	11.1.2.5 Develop an aesthetic sense and creativity through the design and production processes of fashion, clothing and textile products.	Designing a Textile Product to meet a Design Brief.	1. Design process 2. Design brief

UNIT 2: Textiles and Clothing

Content Standard 1.2 Integrate and apply principles and techniques in presenting fashion ideas and illustrations in pattern making and garment construction for a variety of needs and occasions

Benchmark 11.1.2.1 Evaluate the historical influences, technological progression and emerging trends as inspirational sources for design

TOPIC 1: Evaluating The Sources Of Design

Essential Questions:

1. What are the factors influencing textile designs?
2. What are the positive and negative influences?
3. How have styles and designs evolved with the use of technology?

Is there any resemblance of the historic designs in the current trend of clothing?

Essential Knowledge Skills, attitudes and values

Knowledge	Design sources
Skills	Evaluate, analyse, and investigate
Context	Marketing fabrics
Attitudes/Values	Critical thinking, creating self determination

Technology and Industrial Arts Application: Textiles Technology: Textile and Clothing

Learning Objectives

1. By the end of this topic, the students will be able to;
2. Define textile design
3. Evaluate positive and negative influences on textile design

Content Background Sources of Design

In grade 10 we learnt about the 'Impacts as sources of design and fabric construction.' Here we had the opportunity of identifying three factors that acted as inspirational sources of design and fabric construction. The factors included:

1. Historical influences,
2. Technological progression, and
3. Emerging trends

Here is a recap of the lesson thought in grade 10;

Factors Influencing Textile Design

There are so many factors that influence the design and style of clothing and other textile item today.

Historical factors- in the past traditional clothing were obtained from the surrounding environment. Designs or styles of clothing varied from place to place according to the climatic conditions, environment etc. However, clothing styles of today are evolved versions of clothes from the past such as; a grass skirts, the style is used in wrap around or circular skirts. Even traditional designs or art such as Motuan tattoos and Oro tapa cloth designs are printed on fabric today.

Technological progression- has also had a major influence on design styles. Today fashion designers use computer software called **Edraw** to design clothing faster and accurately. Even increases production rate with mass production. Sewing machines and other textile producing gadgets and equipment have improved inefficiency thus causing designs to evolve with them.

Emerging trends are captured by designers through observing consumers. Most fashions styles today are copied from famous people or celebrity stars etc. All these factors have both positive and negative influences on designs.

Having revisited the three factors, let us now make an evaluation of the sources of design.

EVALUATION 1 – HISTORICAL INFLUENCES

The creation of textiles, or cloth and fabric materials, is one of humanity's oldest activities. Despite the great advances in production and manufacturing of clothing, the creation of natural textiles still to this day relies on the effective conversion of fibre into yarn and then yarn to fabric. As such, there are four primary steps in the manufacturing of textiles which have remained the same.

- The first is the harvest and cleaning of the fibre or wool.
- The second is carding and spinning into threads.
- The third is to weave the threads into cloth.
- The fourth and final step is to fashion and sew the cloth into clothes.

Early Production

Like food and shelter, clothing is a basic human requirement for survival.
When settled Neolithic cultures discovered the advantages of woven fibers over animal hides, the making of cloth emerged as one of humankind's fundamental technologies drawing on existing basketry techniques. From the earliest hand-held spindle and distaff and basic handloom to the highly automated spinning machines and power looms of today, the principles of turning vegetable fibre into cloth have remained constant: Plants are cultivated and the fibre harvested.
The fibers are cleaned and aligned, then spun into yarn or thread. Finally, the yarns are interwoven to produce cloth. Today we also spin complex synthetic fibers, but they are still woven together using the same process as cotton and flax were millennia ago.

Evaluation 2 – Technological Progression

What is Technological Progress?

Technological progress refers to the discovery of new and improved methods of producing goods. Changes in technology lead to an increase in productivity of labour, capital, and other factors of production. Technology refers to the process through which inputs are transformed into outputs.

A technological change involves the invention of technologies and their release as open source via research and development, the continual improvement of the technologies, and the diffusion of the technologies throughout the industry or society.

Phases of Technological Progress

1. Invention
2. Innovation
3. Diffusion

How to Measure Technological Progress
One of the most common methods used to measure technological progress is through the Solow Residual method. The Solow Residual method works under the assumption that all changes in output that can't be explained by changes in the capital stock or changes in the number of workers must be due to technological progress.

EVALUATION 3 – EMERGING TRENDS

Emerging Trends in Textile Supply Chain
We find there are so many new techniques coming up in the textile industry with respect to different types of textiles, finishes given to the textiles, dyeing processes, new technologies and the information technology.

Figure 2; Shows the emerging trends in Textiles.
(Source: Anumala, K., 2012)

Because of the ever increasing emerging trends in the fashion industry that exist today, the designs will change every time to meet the demands of the trends just to keep up to date. Fashion is part of everyone's lives today, people want to keep up with the rest of the world and so when something is trending, people go for that look and production is boosted to meet the demands.

Teaching and Learning Strategies

Teachers are encouraged to introduce students to simulations to better understand the concepts taught. Therefore, students will learn effectively and master the knowledge prescribed in each topic. Whilst introducing the topic, guided discovery and research will enable students to get a picture of textiles and clothing.

The knowledge prescribed must be taught. It is not only about teaching what students should know but also to interpret that knowledge for students in a way that makes it relevant to them, and enables them to begin to acquire skills of analysis and problem solving, which will support teaching and learning. Students must be given opportunities to apply their knowledge, to be creative and to solve problems.

Lesson 1: Historical Influences and Technological Progression

Teaching Strategies

Delivery of these lessons will be in the enquiry approach in teaching. Teacher guided questions to establish in the students a starting point and guide them into achieving the objectives in the identified lesson topic.

Learning Strategies

Student are given the opportunity to explore and conduct simple research and decide on the best method to either individually or in pairs or small groups of 3 to work on the assigned activities for each lesson title.

Activity 1

In your own words, describe how you think historical influences is a source of design

Activity 2

In your own words, describe how you think technological progresion is a source of design

Resources

https://www.thoughtco.com/history-of-textile-production-1991659
https://www.corporatefinanceinstitute.com/resources/knowledge/economics/techno-logical-pr…

Lesson 2: Emerging Trends in Textile Supply Chain

Teaching Strategies

Delivery of these lessons will be in the enquiry approach in teaching. Teacher guided questions to establish in the students a starting point and guide them into achieving the objectives in the identified lesson topic.

Learning Strategies

Student are given the opportunity to explore and conduct simple research and decide on the best method to either individually or in pairs or small groups of 3 to work on the assigned activities for each lesson title.

Activity 1

In your own words, describe how you think emerging trends in the textile industry is a source of design

Activity 2

Investigate and define what a supply chain is.

Resources

https://www.thoughtco.com/history-of-textile-production-1991659
https://www.corporatefinanceinstitute.com/resources/knowledge/economics/techno-logical-pr…

UNIT 2: Textiles and Clothing

Content Standard 1.2; Integrate and apply principles and techniques in presenting fashion ideas and illustrations in pattern making and garment construction for a variety of needs and occasions

Benchmark 11.1.2.2; Design a variety of patterns and garments incorporating the trends in fashion, textile and clothing

TOPIC 2: Elements Of Design

Essential Questions:

1. What is an element of design?
2. Why do we have to know about the elements of design?
3. How do these elements affect the design process?

Essential Knowledge Skills, attitudes and values

Knowledge	Garments and patterns
Skills	Design, make, create, develop
Context	Fashion and clothing
Attitudes/Values	Appraise, appreciate

Technology and Industrial Arts Application: Textiles Technology: Textile and Clothing

Learning Objectives

By the end of this topic, the students will be able to;

1. Define the term elements of design
2. Identify the element of design
3. Describe each element of design

Content Background; **Elements of Design**

Every product used in the home has been designed by someone. Designing is about identifying, exploring, developing, applying and communicating and evaluating ideas. There I no secret formula for making something that everyone likes and agrees is a good design. It is up to people to make a choice and decide what they like and dislike and what works best.

Here are 10 elements of design and how they apply to a product which you are familiar.

1. Function

How effectively and efficiently does the product carry out the task for which it I designed?

2. Aesthetics

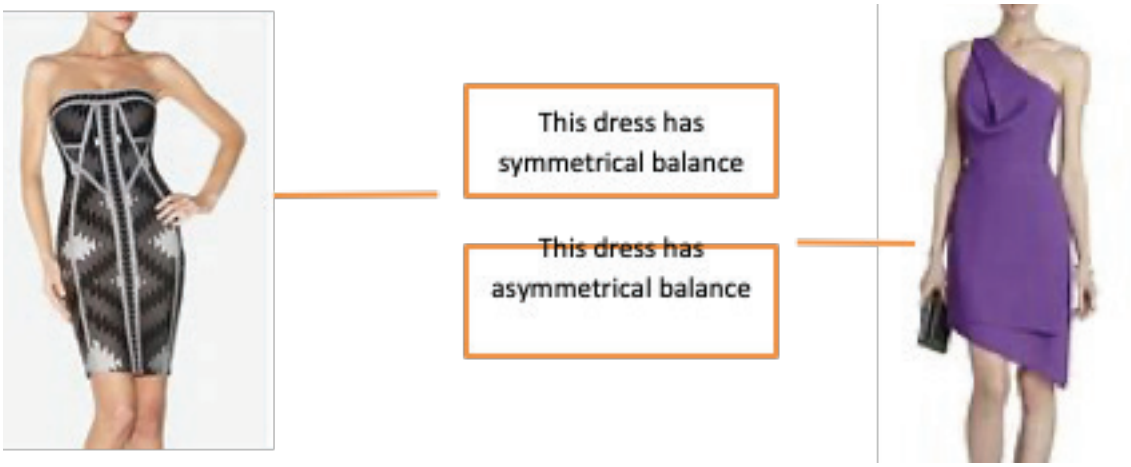
How pleasing is the appearance of the product to the person who will use it? Qualities such a visual appeal, proportion, colour and texture help determine whether or not an item is judged to be aesthetically pleasing.

3. Shape or form

What I the external or outward shape or form of the product? Note that colour and material are not relevant to a product's shape or form.

4. Proportion or balance

If a product is well proportioned, its design is balanced. **Symmetrical balance** means one side looks the same as the other. **Asymmetrical balance** mean one side is different from the other. Either approach can be used in good design.



5. Colour

The colour of a product can affect whether or not it is aesthetically pleasing.

6. Ergonomics

This is how comfortable the form of a product is. Ergonomic aspects of design take into account the bodily needs of the person who will use the product. An ironing board, for example, may have an adjustable stand that can be raised or lowered to suit the height at which different people can work easily and comfortably.

7. Safety

Being able to operate a product safely is an essential consideration when designing products. All products need to be assessed for risk, and any potential dangers mut be removed or at least minimized. This is especially important in the design of products for young children or where electricity is involved.

8. Durability

This refers to how long a product will last in workable conditions. Durability will depend on the quality of the materials and how well the product is made.

9. Ecology

Designers are becoming very aware of the need to reduce waste and care for the environment to ensure sustainable resources for the future. Many products today are developed using eco-design considerations (for example, recycling rice bags to make handbags or backpacks)

10. Equitable and intuitive use

Products are designed for ease of understanding by users regardless of their experience, knowledge, language or physical abilities.

Teaching and Learning Strategies

Teachers are encouraged to introduce students to simulations to better understand the concepts taught. Therefore, students will learn effectively and master the knowledge prescribed in each topic. Whilst introducing the topic, guided discovery and research will enable students to get a picture of textiles and clothing. The knowledge prescribed must be taught. It is not only about teaching what students should know but also to interpret that knowledge for students in a way that makes it relevant to them, and enables them to begin to acquire skills of analysis and problem solving, which will support teaching and learning. Students must be given opportunities to apply their knowledge, to be creative and to solve problems.

Lesson 1: Function, Aesthetic, Shape, Proportion and Colour

Teaching Strategies

Delivery of these lessons will be in the enquiry approach in teaching. Teacher guided questions to establish in the students a starting point and guide them into achieving the objectives in the identified lesson topic.

Learning Strategies

Student are given the opportunity to explore and conduct simple research and decide on the best method to either individually or in pairs or small groups of 3 to work on the assigned activities for each lesson title.

Activity 1

Look at the chair and study the elements of design for the chair. How would you rate or judge each of the elements for that chair: function, aesthetic, shape, proportion, colour, ergonomics, durability, ecology and equitable and intuitive use? Explain each of your rating.

Activity 2

Identify and discuss different types of chairs found in home. Reflect on the process of designing and making the chair. Decide which elements of design influence you most in deciding whether the chairs have a good design.

Resources

Pamela Norman and Kikising G Salley, Outcomes Edition, Home Economics, Book 1, Grade 9/10, (pages 28 – 29)https://www.bing.com/images

Lesson 2: Ergonomics, Safety, Durability, Ecology and Equitability and Intuitive Use.

Teaching Strategies

Delivery of these lessons will be in the enquiry approach in teaching. Teacher guided questions to establish in the students a starting point and guide them into achieving the objectives in the identified lesson topic.

Learning Strategies

Student are given the opportunity to explore and conduct simple research and decide on the best method to either individually or in pairs or small groups of 3 to work on the assigned activities for each lesson title.

Activity 1

Investigate three chairs in your school environment and your home (house). Draw a picture of each type. Consider how and why they have different design elements.

Activity 2

Investigate three tables in your school environment. Draw a picture of each type. Consider how and why they have different design elements.

Resources

Pamela Norman and Kikising G Salley, Outcomes Edition, Home Economics, Book 1, Grade 9/10, (pages 28 – 29)
https://www.bing.com/images

UNIT 2: Textiles and Clothing

Content Standard 1.2; Integrate and apply principles and techniques in presenting fashion ideas and illustrations in pattern making and garment construction for a variety of needs and occasions

Benchmark 11.1.2.3; Apply appropriate principals and techniques in designing fashion ideas.

TOPIC 3: Finishing, Caring for and Maintaining Fabrics.

Essential Questions:

1. What is fabric finishing?
2. Why use fabric finishes?
3. How does the laundry process work?
4. Why must we take care of fabrics and maintain them?

Essential Knowledge Skills, attitudes and values

Knowledge	Design principles and techniques
Skills	Apply, demonstrate, practice
Context	Fashion
Attitudes/Values	Being responsible and open minded

Technology and Industrial Arts Application: Textiles Technology: Textile and Clothing

Learning Objectives

By the end of this topic, the students will be able to;

1. Define fabric finishing
2. Explain why fabric finishes are used
3. Identify the laundry processes

Content Background; **Finishing, Caring For and Maintaining Fabrics. Fabric Finishes**

Look at the fabric of an umbrella. It looks just like ordinary fabric. Feel it. Does it feel the same as a dress fabric? Have you ever wondered why the rain does not come through the umbrella fabric? It does not come through because a special 'finish' of silicone chemicals has been applied to the fabric to make it waterproof.

There are dozens of different finishes that can be given to fibres and fabrics. Five of the finishes are:

- Mercerisation
- Sanforisation
- Crease Resistance
- Water Repellency
- Napping

Why give fabrics finishes?

Fibres and fabrics are given finishes to make them:

- Better quality
- More attractive
- Easier to care for
- More suitable for a variety of purpose

Care And Maintanence of Textile Products

If you want your clothes and fabric household items to last long and well and remain attractive, you need to treat them kindly. Consider the characteristics of the fibres and the fabrics that were used to make the product when deciding on laundering procedures.

Why should fabric be well cared for and maintained?

- Fabric is laundered to remove dust, dirt, grease, germs and sweat.
- Laundering keeps colours bright.
- Clean fabric hangs softly and attractively.
- Dirty, sweaty clothes rot more quickly, go mouldy, become stiff and smelly, tear more easily, and look dull and unattractive.
- Dirty fabric products attract pests such cockroaches, flies, ants, rats, lice and fleas. These pests spoil fabric products and carry germs that can cause sicknesses and skin infections.
- Clean fabric products are nice to wear or use.
- Clean fabric products look attractive and last long and well.

The laundering processes

There are various ways people in PNG wash their fabric clothes and household items. Some people wash their fabric production rivers and spread them out on the ground to dry. Others wash their clothes in electric twin-tub or automatic washing machines and put them in a drying machine to dry. Whatever method people use, there is a range of laundering to choose from, as appropriate, for the fabric products you have.

Below are steps followed in the laundering processes:

- Collecting
- Mending
- Stain removal
- Sorting soaking
- Boiling
- Washing
- Rinsing
- Wringing and spin-drying
- Pegging
- Folding
- Ironing
- Store

Teaching and Learning Strategies

Teachers are encouraged to introduce students to simulations to better understand the concepts taught. Therefore, students will learn effectively and master the knowledge prescribed in each topic. Whilst introducing the topic, guided discovery and research will enable students to get a picture of textiles and clothing.

The knowledge prescribed must be taught. It is not only about teaching what students should know but also to interpret that knowledge for students in a way that makes it relevant to them, and enables them to begin to acquire skills of analysis and problem solving, which will support teaching and learning. Students must be given opportunities to apply their knowledge, to be creative and to solve problems.

Lesson 1: Principals of/in designing fashion ideas

Teaching Strategies

Delivery of these lessons will be in the enquiry approach in teaching. Teacher guided questions to establish in the students a starting point and guide them into achieving the objectives in the identified lesson topic.

Learning Strategies

Student are given the opportunity to explore and conduct simple research and decide on the best method to either individually or in pairs or small groups of 3 to work on the assigned activities for each lesson title.

Activity 1

Write out the instructions for caring for your school uniform.

Activity 2

Investigate laundry products sold in local shops near you and describe their use.

Resources

Pamela Norman and Kikising G Salley, Outcomes Edition, Home Economics, Book 1, Grade 9/10, (pages 128 – 130)

Lesson 2: The Laundering Processes

Teaching Strategies

Delivery of these lessons will be in the enquiry approach in teaching. Teacher guided questions to establish in the students a starting point and guide them into achieving the objectives in the identified lesson topic.

Learning Strategies

Student are given the opportunity to explore and conduct simple research and decide on the best method to either individually or in pairs or small groups of 3 to work on the assigned activities for each lesson title.

Activity 1

The class will be divided into 3 big groups.

- One group discusses and reports on appropriate care of traditional clothing worn for special occasions in a selected province or region.
- Another group discusses and reports on appropriate care of fabric clothing worn by people living in a remote village.
- The third group discusses and reports on appropriate care of fabric clothing worn by people living in a modern house in a large town.

Activity 2

Each group gives an oral report to the rest of the last. Consider the differences and why those differences exist.

Resources

Pamela Norman and Kikising G Salley, Outcomes Edition, Home Economics, Book 1, Grade 9/10, (pages 128 – 130)

UNIT 2: Textiles and Clothing

Content Standard 1.2; Integrate and apply principles and techniques in presenting fashion ideas and illustrations in pattern making and garment construction for a variety of needs and occasions

Benchmark 11.1.2.4; Present fashion ideas and illustrations in patterns and garment construction for specific requirements and occasion

TOPIC 4: Famous Fashion Designers

Essential Questions:

1. Who are the top 5 fashion designers in the world?
2. How did they become famous?
3. What inspired them to venture into fashion?
4. Why is it important to know about this group of people?

Essential Knowledge Skills, attitudes and values

Knowledge	Fashion ideas and illustrations
Skills	Communicate, display, present
Context	Special occasions
Attitudes/Values	Appreciate fashion

Technology and Industrial Arts Application: Textiles Technology: Textile and clothing

Learning Objectives

By the end of this topic, the students will be able to;

1. Identify the top 5 fashion designers in the world
2. Explain how they became famous
3. Discuss the story behind their success
4. Understand why it is important to know about the

Content Background Famous Fashion Designers

Some much have taught and learnt about fashion since your grade 9 years studying this subject. In this lesson will look at some of the famous fashion designers well known in the world.

1. Coco Chanel

Famous for timeless designs, trademark suits and little black dresses, the famous fashion designer, Coco Chanel is a true epitome of creativity. She is a self-made woman.
Chanel was raised in an orphanage and taught to sew. She had a diminutive career as a singer before opening her first clothes shop in 1910.
In the year 1920s, she launched her first perfume made of natural extracts and artificial essence named Chanel No. 5 worldwide and in the year 1926, she designed and introduced the “Little Black Dress” which was later named as “Chanel’s Ford” by French Vogue.
Coco Chanel is majorly known for introducing the concept of using jersey fabric to create and embellish clothing for women’ undergarments.
Chanel is the only fashion designer who features on Time magazine’s list of the 100 most influential people of the 20th century. Today, Chanel stands among one of the world’s top brands in fashion.

2. Georgio Armani

Georgio Armani, the Italian fashion designer, is popularly known for the uniqueness, elegance and style in the fashion line. Apart from clothing, he has expanded the company’s horizons into perfumes with unique fragrances, hotels, restaurants, and cafes worldwide.

He started his career from a garments shop, La Rinascente, where he assisted a photographer in arranging the window. Thereafter, in 1970s, after mastering the craft, Giorgio started freelancing in designing new fashion and sending them to other garment manufacturers. With due course of time, he established his own brand in the year 1975.

Later, in 1979,Georgio established Giorgio Armani Corporation. Starting with clothing, underwear, swimwear and accessories for men and women, the company expanded into introducing Armani Junior, Armani Jeans, and Emporio Armani that consisted of more stylish products at affordable prices.
Armani also made a great impact on Hollywood by designing costumes for actors like Penelope Cruz, Anne Hathaway, and Megan Fox etc. in more than 100 films.

3. Calvin Klein

The youngest fashion designer to be listed on the International best-dressed list, Calvin Klein is known worldwide for his extravagancy in the fashion industry.
He owes it all to his mother who instilled in him a love of art and fashion. Calvin started his career as a loner who taught himself how to sketch and sew.
Calvin always knew that he wanted to be a fashion designer. He always dreamt of starting his own fashion company.

For that, he even worked at his father's grocery store to make extra money.
In the year 1968, Klein founded his own company, Calvin Klein Ltd., with his friend as his business partner. In the year 1973, Klein diversified his company's line of manufacturing and got engrossed in other sections like sportswear etc. and giving birth to American leisurewear.

He is also known for his line of menswear and women's swear. He also designs home collections, fragrances and cosmetics.

Calvin Klein has received a couple of recognitions and:

* Was awarded the Coty award by the fashion press in 1973, 1974, and 1975
* Struck a hat-trick with the prestigious Coty Awards from 1973 to 1975, becoming the youngest designer ever to achieve the feat
* Received three awards from the Councils of Fashion Designs of America in 1981, 1983 and 1993
* In 1983, Klein was listed on the International Best Dressed List
* In 1996, he made it to the list of 25 most influential Americans, published by Times Magazine.

4. Donatella Versace

Donatella Versace, fashion designer

The renowned fashion designer Donatella Versace inherited the Versace Empire from her brother and later gave her own label -- Versus. In February 2001, Donatella launched her own fragrance called Versace Woman.

Under her arena, Versace moved beyond clothing to include accessories, home furnishings, and hotels, morphing Versace into a complete lifestyle brand.

In the year 2008, she was made the honorary chairman for London's Fashion Fringe, judging upcoming designer talent. In November 2012, she appointed flourishing Irish designer JW Anderson to create a capsule collection for the Versus label.

Versace has achieved a lot in the fashion industry. Some of her achievements are listed below:

* In the year 2007, Versace was inducted into the 'Rodeo Drive Walk of Style'. In October that year, pop star Prince presented her with the 'Fashion Group International Superstar Award'
* In 2010, 'Versace' was nominated for the 'VH1 Do Something With Style Award' for providing art supplies to children

5. Rohit Bal

The famous fashion designer Rohit Bal, started his career with his brother Rajiv Bal in New Delhi in 1986 and later started his own first independent collection in the year 1990.'
Bal's clientele list includes Uma Thurman, Cindy Crawford, Pamela Anderson, Naomi Campbell and Anna Kournikova. The Swatch Group sponsors most of Bal's fashion shows in India, New York, Paris and Singapore.

He has also been the brand ambassador for Omega SA since 2001. He is best known for his use of Lotus and Peacock motifs.
Rohit Bal has won numerous awards for his eminence in the fashion industry. He won the 'Designer of the Year' award at the Indian Fashion Awards in the year 2006 and also 'Designer of the Year' at the Kingfisher Fashion Achievement Awards in the year 2001.

Here are few illustrations of the designers' work and brands.

VERSACE

Donatella Versace

Calvin Klein

Calvin Klein

Rohit Bal

Teaching and Learning Strategies

Teachers are encouraged to introduce students to simulations to better understand the concepts taught. Therefore, students will learn effectively and master the knowledge prescribed in each topic. Whilst introducing the topic, guided discovery and research will enable students to get a picture of textiles and clothing.

The knowledge prescribed must be taught. It is not only about teaching what students should know but also to interpret that knowledge for students in a way that makes it relevant to them, and enables them to begin to acquire skills of analysis and

problem solving, which will support teaching and learning. Students must be given opportunities to apply their knowledge, to be creative and to solve problems.

Lesson 1: Coco Chanel, Georgia Armani and Calvin Klein

Teaching Strategies

Delivery of these lessons will be in the enquiry approach in teaching. Teacher guided questions to establish in the students a starting point and guide them into achieving the objectives in the identified lesson topic.

Learning Strategies

Student are given the opportunity to explore and conduct simple research and decide

on the best method to either individually or in pairs or small groups of 3 to work on the assigned activities for each lesson title.

Activity 1

Write a short auto biography of each of the designers

Activity 2

What inspired each of these designers to venture into fashion?

Resources

https://www.indiatoday.in/education-today/gk.

Lesson 2: Donatella Versace and Rohit Bal

Teaching Strategies

Delivery of these lessons will be in the enquiry approach in teaching. Teacher guided questions to establish in the students a starting point and guide them into achieving the objectives in the identified lesson topic.

Learning Strategies

Student are given the opportunity to explore and conduct simple research and decide on the best method to either individually or in pairs or small groups of 3 to work on the assigned activities for each lesson title.

Activity 1

Write a short auto biography of each of the designers

Activity 2

What inspired each of these designers to venture into fashion?

Resources

https://www.indiatoday.in/education-today/gk.

UNIT 2: Textiles and Clothing

Content Standard 1.2; Integrate and apply principles and techniques in presenting fashion ideas and illustrations in pattern making and garment construction for a variety of needs and occasions

Benchmark 11.1.2.5; Develop an aesthetic sense and creatively through the design and production processes of fashion, clothing and textile products

TOPIC 5: Creating A Textile Product To Meet A Design Brief

Essential Questions:

1. What are the production stages in textile?
2. What are the skills and techniques required in the production process?

Essential Knowledge Skills, attitudes and values

Knowledge	Fashion clothing and textile product
Skills	Develop, make, produce and design
Context	
Attitudes/Values	Be encouraging towards others designs and creations

Technology and Industrial Arts Application: Textiles Technology: Textile and clothing

Learning Objectives

By the end of this topic, the students will be able to;

1. Define textile production
2. Research and describe textile production process
3. Develop a textile product/item

Content Background; **Creating A Textile Product To Meet A Design Brief - Instructions and project planning**

Instructions;

Create one or more products to meet a design brief and demonstrate that you can:

- Apply safe and appropriate codes and practices in the classroom.
- Apply knowledge and understanding through identifying, selecting and using various fibres and fabrics.
- Demonstrate practical skills and techniques.
- Use the design process to produce appropriate solutions. Evaluate the appropriateness of the fibres or fabrics used to produce a product.

Produce a design portfolio showing all the steps undertaken in the making of the products. The design portfolio might include:

- Results of investigations
- Rough notes or sketches of design ideas
- Final drawing or patterns
- Samples
- Instructions for making a product
- Instructions for making the product
- A list of materials and equipment used
- Evaluation notes or a report

Project planning

Context

What is the context where the product will be used?

Problem

What is the problem for which a solution is needed?

Design Brief

What is the product to be made as a possible solution to the problem?

Specification

What are the qualities required, and constrains on size, time, cost and materials?

Investigation

What investigations should you undertake to help you get ideas for a fabric product to make? Decide on the appropriate fibre, yarns and fabric to use and from where you could obtain them.

Drawings

Make multiple ketches and choose the best one to draw neatly. Make drawings of construction processes. Label drawing.

Making

Make a pattern. Lay the pattern on a piece of fabric and cut out the required pieces. Join the pieces with appropriate joining stitches and processes.

Make judgements about the standards of the products and its suitability for its purpose. Get the reaction of your classmates to your product.

Teaching and Learning Strategies

Teachers are encouraged to introduce students to simulations to better understand the concepts taught. Therefore, students will learn effectively and master the knowledge prescribed in each topic. Whilst introducing the topic, guided discovery and research will enable students to get a picture of data textiles and clothing.

The knowledge prescribed must be taught. It is not only about teaching what students should know but also to interpret that knowledge for students in a way that makes it relevant to them, and enables them to begin to acquire skills of analysis and problem solving, which will support teaching and learning. Students must be given opportunities to apply their knowledge, to be creative and to solve problems.

Lesson 1: What is textile production?

Teaching Strategies

Delivery of these lessons will be in the enquiry approach in teaching. Teacher guided questions to establish in the students a starting point and guide them into achieving the objectives in the identified lesson topic.

Learning Strategies

Student are given the opportunity to explore and conduct simple research and decide on the best method to either individually or in pairs or small groups of 3 to work on the assigned activities for each lesson title.

Activity 1

Design and make a fabric item (for example, an apron, a children's, a pot holder, sports short, a purse or a pillowcase). These are suggestions only. Three sample designs are provided (starting on page 150):

- One for an apron
- One for a children's toy
- One for a pot holder

The class can select one of these design briefs, or-in consultation with the teacher-create one of their own. All students in a class must work from the same design brief.

Activity 2

Display the finished product began in Activity 1. Do a presentation on what, how and why you produced that textile product?

Resources

Pamela Norman and Kikising G Salley, Outcomes Edition, Home Economics, Book 1, Grade 9/10, (pages 148 – 149)

Lesson 2: Design Brief

Teaching Strategies

Delivery of these lessons will be ~~in the~~ enquiry ~~approach in~~ based teaching.
Teacher guided questions to establish in the students a starting point and guide them into achieving the objectives in the identified lesson topic.

Learning Strategies

Student are given the opportunity to explore and conduct simple research and decide on the best method to either individually or in pairs or small groups of 3 to work on the assigned activities for each lesson title.

Activity 1

In pairs, brainstorm and list fabrics products that students could make for personal use or for sale. Make your list as complete as you can. Compare your ideas with those of other pairs.

Activity 2

Produce a design brief of the product you chosen and make a prototype for the product.

Resources

Pamela Norman and Kikising G Salley, Outcomes Edition, Home Economics, Book 1, Grade 9/10, (pages 148 – 149)

PLANNING AND PROGRAMING

TEXTILE TECHNOLOGY - PLANNING AND PROGRAMMING

Planning and Programming Process

The Planning and Programming Process used by the Business and Technology Subjects is a 8 step process. This process begins from Unpacking the Content Standards and Benchmarks and ends with planning a daily lesson plan.

Step 1: Identify the number of Strands and Units in the subject Syllabus

Step 2: Identify the total number of Content Standards, Benchmarks and Number of Topics (Syllabus and Teacher Guide)

Step 3: Consider the Facts and Considerations in the Planning and Programming Process (subject related)

Step 4: Distribute the Content evenly across the 4 school terms in a Matrix (Proposed Template)

Step 5: Expand and plot the distributed content into the complete Yearly Content Overview for the subject for the grade (Proposed Template)

Step 6: Develop the Termly Programs (Proposed Template – 3 part programme)

Step 7: Develop the Weekly Teaching Program (Proposed Template) Daily Lesson Plan (SBC Template)

Step 8: Review, Evaluate and Re-plan the yearly, termly, weekly Programs

TEXTILE TECHNOLOGY -PLANNING AND PROGRAMMING PROCESS

Planning and Programming Process involves 8 steps. The steps are outlined and described with samples provided to assist and guide you.

Step 1: Identify the number of Units in the subject Syllabus (Grade 11&12 TIA Syllabus Page 30-32)

It is important to first identify the strand and unit names for familiarisation and also the number of units in the Grade 11 Textile Technology strand /subject.

The table below outlines the units for grade11 Textile Technology strand/subject. This helps teachers understand how to deal with units when they are expanded into evidence outcomes and benchmarks at each grade.

The strands and units of content standards explain the progression from Grade 9 to Grade 10, linking to senior high school Technology and Industrial Arts content. The order and linkage of units signifies what the students will achieve from one grade to the next.

Technology and Industrial Arts is organised around five strands – Textile Technology, Food Technology, Construction Technology, Communication Technology and Computer Technology. These strands are comparable with the strands used internationally. The Content Standard of each Strand is based on units. The Strands, Units and Content Standards are outlined in the table below:

Step 1: Identify the Strand, Units Content Standards and Benchmarks in the TIA subject Syllabus (Grade 11&12 TIA Syllabus Page 30-32)

STRAND	UNITS	Content Standards	Benchmarks
Textile Technology	Fibres and Fabrics	Investigate the evolution, characteristics, designs and trends of fabrics and fabric designs, their construction, production, representation, regulation and marketing.	11.1.1.1
			11.1.1.2
			11.1.1.3
			11.1.1.4
			11.1.1.5
	Textiles and Clothing	1.2 Integrate and apply principles and techniques in presenting fashion ideas and illustrations in pattern making and garment construction for a variety of needs and occasions	11.1.2.1
			11.1.2.2
			11.1.2.3
			11.1.2.4
			11.1.2.5

Step 2: Identify the total number of units, content Standards and benchmarks Textile Technology in the grade 11 and 12 syllabus

Table of units, content Standards and benchmarks

Subject/ Strand	Units	Content Standards	Benchmarks
1	**2**	**2**	**10**

- ► Use the Syllabus to derive the total number of Content Standards and total number of Benchmarks
- ► Use the unpacking tool to derive your topics and the total number of topics
- ► Place or slot them in a matrix as in the sample shown below so you are knowledgeable and made aware of the total number of content standards,

benchmarks and topics that you will be working with in the planning and programming of teaching and learning for the subject in a school year for that grade.

Grade 11 Textile Technology Content Matrix

Consult the Grade 11 Technology and Industrial Arts Content Matrix showing the strand, units, content standards, Benchmarks and topics to be covered in Grade 11. Note that this would be in the teacher Guide but because the teacher guides are not available, we have provided this matrix for you to use to program.

Step 3: Consider the Facts and Considerations in the Planning and Programming Process (subject related)

It is important to consider and analyse facts that are worth considering if these facts will help or if these facts will pause a challenge to the planning and programming process.

Facts and Considerations about the Grade 11 Technology and Industrial Arts

1. As per the Matrix, there are a total of 10 Benchmarks and Topics which must be programmed and taught in a school year.
2. Textile Technology is now a subject which requires all students to take as a sub ject
3. There are specialist teachers who are trained to teach the specialist content in the Textile Technology strand/ subject.
4. Current practice has one teacher who can teach Food and Textile (Currently Home Economics), one teacher who can teach Construction Technology (currently Practical Skills) and one teacher who can teach Communication and computer Technology (currently Computer Studies and ICT).

5. With consideration #4, there are 3 personnel who will be required to teach TIA together to deliver the subject. ***Thus, this fact is considered to propose the Planning and Programming Process for TIA subject into a 3-part Teaching and Learning Planning and Programming Process.*** Which means TIA Subject Program is made up of 3 sub-programs

6. Time Allocation for Grade 11 Technology and Industrial Arts is 200 minutes per week which means it has 5 periods/5 lessons a week: 1 block of 40 minutes (2periods) periods and 1 x 160 minutes (4 periods blocked)

7. There is a total of 40 teaching weeks in a school year (4 Terms x 10 Weeks each)

8. In a term, there are about 8 weeks of actual teaching weeks which gives us 40 periods/40 lessons of actual teaching in a term (5 periods a week x 8 actual teaching weeks in a term)

9. Using these facts and considerations, we can Plan and Program the Textile Technology according to this understanding:

Understanding 1:

There are 3 x Teachers who are required to teach the TIA subjects in 40 weeks. Therefore teaching and learning must be programmed using the 3 parts (40 /3 = 13.3 weeks per part).

Understanding 2:

There are 77 Benchmarks for TIA that must be planned and programed for 40 weeks but distributed equally according to the 3-parts: Textile & Food =34 BMs; Construction = 33 BMs; Communication &Computer = 33. (use the strand with the highest BMS to determine the number of BMS per week = 34 /16 = 2.1 BMS week)

Understanding 3:

The 3-factor plan and program for TIA becomes the Yearly plan and Program (meaning to say, the plan and program will be utilized by the teacher for 3 lots of students taking TIA in a rotation approach for a year. The TIA Content distribution will be determined by the 3 parts (3 available personnel) and therefore the content will be distributed.

Understanding 4:

In the instance where the school decides to deliver the Food Technology, Textile Technology, Communication Technology and Computer Technology from term 1-3, then the Construction Technology gets to be taught in Term 4. This allows for the school to acquired or make available the necessary requirements for the construction technology strand. Otherwise, it becomes school-based and students are awarded an attainment certificate- for the strands they have learnt and NOT TIA. TIA is externally examined and certified.

- *These understandings may not directly affect your planning and programing as you are now required to plan Textile Technology as a subject or standalone strand.*

Grade 11 Textile Technology Content distribution for the Teaching Year

This is a suggested distribution of Grade 11 Textile Technology content opted for delivery in a school year for an overview of the Textile Technology Content for Grade 11.

STRAND	UNITS	Content Standards	Benchmarks	Topics
Textile Technology	Fibres and Fabrics	Investigate the evolution, characteristics, designs and trends of fabrics and fabric designs, their construction, production, representation, regulation and marketing.	11.1.1.1	Textile Design, Production and Marketing
			11.1.1.2	Factors Influencing Consumer Selection of Textiles and Garments.
			11.1.1.3	Textile Consumerism and Awareness
			11.1.1.4	Fabric Construction Processes
			11.1.1.5	Regulations in the Textile Industry
	Textiles and Clothing	1.2 Integrate and apply principles and techniques in presenting fashion ideas and illustrations in pattern making and garment construction for a variety of needs and occasions	11.1.2.1	Evaluating the Sources of Design
			11.1.2.2	Elements of Design
			11.1.2.3	Finishing, Caring for and Maintaining Fabrics
			11.1.2.4	Famous Fashion Designers
			11.1.2.5	Designing a Textile Product to meet a Design Brief.

Step 4: Distribute the Content evenly across the 4 terms

The teaching content outweighs the teaching weeks and therefore considerations must be made on teaching and learning approaches for example; integration, project-based learning, etc. we have provided some information to help you distribute the Technology and Industrial Arts subject content to be programmed fairly across the 4 terms. This important for you as a classroom teacher as it can provide you some time plan for your grade or class assessment especially at the school level.
The table below is a sample for the planning of the Textile Technology strand/ subject for the school year.

Textile Technology content distribution in terms for a year.

Week	Term1	Term 2	Term 3	Term 4
1	**Orientation**	**Revision of Term 1**	**Revision of Term 1**	**Revision of Term 1**
2	Unit: 1 Content Standards: 1.1 Benchmarks: 11.1.1.1	Unit: 1 Content Standards: 1.1 Benchmarks: 11.1.1.3	Unit: 1 Content Standards: 1.2 Benchmarks: 11.1.2.1	Unit: 1 Content Standards: 1.2 Benchmarks: 11.1.2.3
3	Unit: 1 Content Standards: 1.1 Benchmarks: 11.1.1.1	Unit: 1 Content Standards: 1.1 Benchmarks: 11.1.1.3	Unit: 1 Content Standards: 1.2 Benchmarks: 11.1.2.1	Unit: 1 Content Standards: 1.2 Benchmarks: 11.1.2.3
4	Unit: 1 Content Standards: 1.1 Benchmarks: 11.1.1.1	Unit: 1 Content Standards: 1.1 Benchmarks: 11.1.1.4	Unit: 1 Content Standards: 1.2 Benchmarks: 11.1.2.2	Unit: 1 Content Standards: 1.2 Benchmarks: 11.1.2.4
5	Unit: 1 Content Standards: 1.1 Benchmarks: 11.1.1.2	Unit: 1 Content Standards: 1.1 Benchmarks: 11.1.1.4	Unit: 1 Content Standards: 1.2 Benchmarks: 11.1.2.2	Unit: 1 Content Standards: 1.2 Benchmarks: 11.1.2.4
6	Unit: 1 Content Standards: 1.1 Benchmarks: 11.1.1.2	Unit: 1 Content Standards: 1.1 Benchmarks: 11.1.1.4	Unit: 1 Content Standards: 1.2 Benchmarks: 11.1.2.2	Unit: 1 Content Standards: 1.2 Benchmarks: 11.1.2.4

7	Unit: 1 Content Standards: 1.1 Benchmarks: 11.1.1.2	Unit: 1 Content Standards: 1.1 Benchmarks: 11.1.1.5	Unit: 1 Content Standards: 1.2 Benchmarks: 11.1.2.2	Unit: 1 Content Standards: 1.2 Benchmarks: 11.1.2.5
8	Unit: 1 Content Standards: 1.1 Benchmarks: 11.1.1.3	Unit: 1 Content Standards: 1.1 Benchmarks: 11.1.1.5	Unit: 1 Content Standards: 1.2 Benchmarks: 11.1.2.3	Unit: 1 Content Standards: 1.2 Benchmarks: 11.1.2.5
9	Unit: 1 Content Standards: 1.1 Benchmarks: 11.1.1.3	Unit: 1 Content Standards: 1.1 Benchmarks: 11.1.1.5	Unit: 1 Content Standards: 1.2 Benchmarks: 11.1.2.3	Unit: 1 Content Standards: 1.2 Benchmarks: 11.1.2.5
10	Assessment	Assessment & Reporting	Assessment & Reporting	Assessment

Note:
This arrangement for the school year spreading the benchmarks from the 2 units Fibres and Fabrics and Textiles and Clothing into the terms.

Assessment is and will be planned by the teacher according to the arrangement of the benchmarks after each benchmark is taught or 2 benchmarks are taught. Teachers are in a better position to make that judgment.

Sample of a Term Program for Grade 11.

This is a sample term program for the grade 11 class. It is a guide for the teacher to begin the year.

Sample Program – Term 1

Term	One
Unit	Fibres and Fabrics
Content Standard	Investigate the evolution, characteristics, designs and trends of fabrics and fabric designs, their construction, production, representation, regulation and marketing.

Weeks	**Benchmarks**	**Topics**	**Lesson Titles**	**Activity**
1	**Orientation of the school year – student registration and enrolement**			
2	11.1.1.1 – Display the processes of the fashion design, construction, production and marketing of textiles and clothing.	Textile Design, Production and Marketing	1.Process of fashion design in textile and clothing	Activity 1 & 2
3	11.1.1.1 – Display the processes of the fashion design, construction, production and marketing of textiles and clothing.	Textile Design, Production and Marketing	2. Production processes of textile and clothing	Activity 1&2
4	11.1.1.1 – Display the processes of the fashion design, construction, production and marketing of textiles and clothing.	Textile Design, Production and Marketing	3. Marketing processes of textile and clothing products.	Activity 1&2
5	11.1.1.2 – Analyze social, economic, cultural, environmental and technological factors influencing consumer selection of textiles and garments.	Factors Influencing Consumer Selection of Textiles and Garments.	1. Climatic and Occasional Factors.	Activity 1 & 2
6	11.1.1.2 – Analyze social, economic, cultural, environmental and technological factors influencing consumer selection of textiles and garments.	Factors Influencing Consumer Selection of Textiles and Garments.	2. Age and Profession Factors.	Activity 1&2
7	11.1.1.2 – Analyze social, economic, cultural, environmental and technological factors influencing consumer selection of textiles and garments.	Factors Influencing Consumer Selection of Textiles and Garments.	2. Age and Profession Factors.	Activity 3

8	11.1.1.3 – Distinguish the various physical, thermal, chemical and biological properties of fabrics.	Textile Consumerism and Awareness	1. Physical and thermal properties of fabric.	Activity 1&2
9	11.1.1.3 – Distinguish the various physical, thermal, chemical and biological properties of fabrics.	Textile Consumerism and Awareness	2. Chemical and biological properties of fabric.	Activity 1&2
10	Assessment and Reporting Week			

Note: The teacher could check the Term One sample program against the content spread out in the year plan above. This is a guide for you as grade or class teacher help you begin your school year. As a specialist you are encouraged to make adjustments to the lesson titles and activities to suit the need of your students learning.

Step 5: Expand and plot the distributed content into the complete 37 Weeks 3-Part Yearly Content Overview for the grade

The strand, Units and Benchmarks are further unpacked into Topics and Lesson Titles in the Teacher Guides.

- The Yearly Content Overview for the Technology and Industrial Arts is a 16 week 3-part Content Overview which is Yearly Content Overview for the Technology and Industrial Arts Subject. .
- It outlines the Strands, Units, Content Standards, Benchmarks, Topics and Lessons to be taught in 16 weeks for each part. Teachers have the option of outlining their
- Yearly Content Overview in a template that can be easily read and understood by all who will be using the Yearly Overview to derive their Termly teaching programs. (a sample template is provided below)
- In the sample below, the Strands, Units, Content Standards, Benchmarks, Topics and Lesson Titles are distributed evenly across the 16 weeks for each part that must be programmed
- A sample is given below for your convenience to help you plan for your termly program.

REFER TO THE YEARLY CONTENT PLAN DISTRIBUTED ACROSS THE FOUR TERMS IN STEP 4 OF THE PROCESS FOR PLANNING AND PROGRAMING.

Step 6: Develop the Termly Programs

Extract the terms content from the Yearly Overview to expand the content into the termly teaching program.

Note that the TIA program is developed in 3-parts and 1 of the 3 parts is the program to be used all year around for the different lots of students rotating to take all 5 strands of TIA. Below is a proposed Template to develop a Teaching Program for a Term.(13 weeks)

Subject: _____Grade _____Term:____ Year: _____

Week	Content Standards	Benchmark	Unit	Topic	Learning Objective	Knowledge	Skill	Attitude/ Values	Performance Standard
Write the week number	Write the Coding only	Write the Coding only	Write the Unit number and Name	Write the Topic number and Name	By the end of this Topic, Students will be able to: Write the learning Objectives for the Topic	Write the essential knowledge to be learnt in this topic	Write the essential skill to be learnt in this topic	Write the essential attitude and values to be learnt in this topic	By the end of this Topic, students will be able to; Write the Performance Standard (if the Benchmark carries one)

Note: A Performance Standard will only be included if the Benchmark has been nominated to carry a Performance Standard (Assessment). Otherwise, it is not very necessary for all Benchmarks to have a Performance Standard.

Step 7: Develop the Weekly Teaching Program (Proposed Template) and Daily Lesson Plan

(SBC Template)

Template 1: Using Topics to develop Weekly Teaching Program

You can use the Topics to develop the weekly teaching program
Below is a proposed Template to develop a Teaching Program for a week

Subject: _____ Grade: ____ Term:_____ Week: ____ Date: _____Year: _____

CS	BM	Unit	Topic	Learning Objective	Knowledge	Skill	Attitude/ Values	Suggested Learn Activities	Performance Standard

Write the Coding only	Write the Coding only	Write the Unit number and Name	Write the Topic number and Name	By the end of this Topic, Students will be able to: Write the learning Objectives for the Topic	Write the essential knowledge to be learnt in this topic	Write the essential skill to be learnt in this topic	Write the essential attitude and values to be learnt in this topic	List down the learning activities that will be done in this topic	By the end of this Topic, students will be able to; Write the Performance Standard (only if the Benchmark carries a performance standard)

Template 2: Using Lesson Titles to develop Weekly Teaching Program

Use the unpacking process to derive lesson titles and lesson objectives to be able to expand your weekly teaching program.

Below is a proposed Template to develop a Teaching Program for a week

Subject: _____ Grade: ____ Term:_____ Week: ____ Date: _____Year: _____

CS	**BM**	**Unit**	**Topic**	**Learning Objective**	**Knowledge**	**Skill**	**Attitude/ Values**	**Performance Standard**	**Lesson Number and Titles**	**Lesson Objectives**	**Suggested Learning Activities**
Write the Coding only	Write the Coding only	Write the Unit number and Name	Write the Topic number and Name	By the end of this Topic, Students will be able to: Write the learning Objectives for the Topic	Write the essential knowledge to be learnt in this topic	Write the essential skill to be learnt in this topic	Write the essential attitude and values to be learnt in this topic	By the end of this Topic, students will be able to; Write the Performance Standard (if the Benchmark carries one)	Lesson 1:	L1 Objectives	
									Lesson 2:	L2 Objectives	
									Lesson 3: Etc.	L3 Objectives	

Timetabling of Textile Technology

The teaching and learning of Textile Technology can be organized in the manner of class rotational basis. There are three teachers who will be teaching the subject TIA.

1: The Home Economics Teacher,

2: The Practical Skills Teacher, and

3. TheMathematics /Science/Computing Teacher.

These three teachers will be timetabled to teach TIA during the term. Then the planning and programming will be organized in this same manner only each strand teacher will extract the strand program for teaching as these are subject specific content. This is to ensure that teachers are on contact throughout the terms and to maintain their teaching loads.

This Process MUST BE DONE COLLABORATIVELY BY ALL WHO TEACH THE SUBJECT. IT MUST BE DONE PROGRESSIVELY

Notes to the Teachers;

It is advised that all teachers assigned to teach Technology and Industrial Arts in your school should study the organization of the content by strand in the other Teachers Guides for the respective strands as indicated in the Grade 11 and 12 syllabus for

Technology and Industrial Arts to guide you through the process steps for programing Textile Technology benchmarks with other strand benchmarks for the other 4 strand.

The commended programing strategies for this strand are:

1. Programing by the strands according to the school terms in the order the strands appear in the syllabus. Here is a sample done for grade 10 you could adopt. This would look this should you wish to take up the challenge.:

Sample Grade 10 Year Plan for 5 Strands in TIA – only an option for teachers.

Weeks	Term 1	Term2	Term3	Term4
1	Orientation	CONS TEC **Building Technology Unit 1 bm 1 and 2,**	CONST TEC Welding Technology Unit 1 bm 3	COMM TEC **Data Communication and Network** Unit 1 bm 5
2	Textile Technology: Fibres and Fabrics: Unit 1 Benchmarks 1 and 2	CONST TEC **Building Technology Unit 1 bm,3 4,**	CONST TEC Welding Technology Unit 1 bm 4	COMM TEC Computer Security and Safety Unit 2 bm 1 and 2
3	Textile Technology: Fibres and Fabrics: Unit 1 Benchmarks 3 and 4	CONST TEC **Building Technology Unit 1 bm, 5, 6**	CONST TEC Engineering Technolog Unit 1bm 1	COMM TEC Computer Security and Safety Unit 2 bm 3and 4

4	Textile Technology: Fibres and Fabrics: Unit 1 Benchmarks 5 and Unit 2 Bmark 1	CONST TEC Electrical Technology Unit 1bm 1 and 2	CONST TEC **Engineering Technology** Unit 1 bm 2	COMM TEC Computer Security and Safety Unit 2 bm 5
5	Textile Technology: Textile and Clothing: Unit 2 Benchmark 2 & 3 4	CONST TECU1 **Electrical Technology** Unit 1bm 3	CONST TEC **Engineering Technology** Unit 1 bm 3	COMP TEC **Computer Architecture** Unit 1 Bm 1 and 2
6	Food Technology: Food and Nutrition: Unit1 Bm 1 and 2	CONST TEC **Plumbing Technology Unit 1 bm 1 and 2**	CONS TEC **Engineering Technology** Unit 1 bm 4	COMP TEC **Computer Architecture** Unit 1 Bm 3 and 4
7	Food Technology: Unit 1 Bm3 &4	CONST TEC **Plumbing Technology** Unit 1bm 3	CONS TEC **Engineering Technology** Unit 1 bm 5	COMP TEC **Computer Architecture** Unit 1 Bm 3 and 4
8	**Food Technology: Unit 1 Bm5 & Unit 2 bm 1**	CONST TEC **Plumbing Technology** Unit 1bm 4	CONS TEC **Engineering Technology** Unit 1 bm 6	COMP TEC **Computer Software** Unit 1 Bm 1 and 2
9	Food Technology: **Unit 2 bm 2and 3**	CONST TEC Welding Technology Unit 1 bm 1	COMM TEC **Data Communication and Network-**Unit 1 bm 1 and 2	COMP TEC **Computer Software** Unit 1 Bm 3 and 4 and 5
10	Food Technology: **Unit 2 bm 4and 5**	CONST TEC Welding Technology Unit 1 bm 2	COMM TEC **Data Communication and Network-**Unit 1 bm 3 and 4	ASSESSMENT
11		ASSESSMENT	ASSESSMENT	

This program for a school year is just a suggestion; you could do a similar one for your class/grade. You can do a check in the sample before this suggestion decides on the best option for your class/grade. You are also conducting performance assessment after every third or fourth bench is taught in each unit.

Sample Grade 10 Term Plan for 5 Strands in TIA – only an option for teachers.

Week	Textile Technology and Food Technology	Construction Technology	Communication and Computer Technology
1	Textile Technology: Fibres and Fabrics: Unit 1 Benchmarks 1 and 2	Building Technology Unit 1 bm 1 and 2, 3	Communication Technology Data Communication and Network-Unit 1 bm 1 and 2

2	Textile Technology: Fibres and Fabrics: Unit 1 Benchmarks 3 and 4	Building Technology Unit 1 bm 4, 5, 6	Communication Technology Data Communication and Network-Unit 1 bm 3 and 4
3	Textile Technology: Fibres and Fabrics: Unit 1 Benchmarks 5 and Unit 2 Benchmark 1	Electrical Technology Unit 1bm 1 and 2	Communication Technology Data Communication and Network Unit 1 bm 5
	Assessment	Assessment	Assessment
4	Textile Technology: Textile and Clothing: Unit 2 Benchmark 2 and 3	Electrical Technology Unit 1bm 3	Communication Technology Computer Security and Safety Unit 2 bm 1 and 2
5	Textile Technology: Textile and Clothing: Unit 2 Benchmark 4	Plumbing Technology Unit 1 bm 1 and 2	Communication Technology Computer Security and Safety Unit 2 Bm 3 and 4
6	Food Technology: Food and Nutrition: Unit1 Bm 1 and 2	Plumbing Technology Unit 1bm 3 and4	Communication Technology Computer Security and Safety Unit 2 bm 5
	Assessment	Assessment	Assessment
7	Food Technology: Unit 1 Bm3 &4	Welding Technology Unit 1 bm 1	Computer Technology Computer Architecture Unit 1 Bm 1 and 2
8	Food Technology: Unit 1 Bm5 &	Welding Technology Unit 1 bm 2 and 3	Computer Technology Computer Architecture Unit 1 bm 3 and 4
9	Food Technology: Unit 2 bm 1and 2	Welding Technology Unit 1 bm 4	Computer Technology Computer Software- Unit 2 bm 1 and 2
	Assessment	Assessment	Assessment
10	Food Technology: Unit 2 bm 3and 4	Engineering Technology Unit 1bm 1 and 2	Computer Technology Computer Software Unit 2 bm 3 and 4
11	Food Technology: Unit 2 Bm 5	Engineering Technology Unit 1 bm 3 and 4	Computer Technology Computer Software -Unit 2 bm 5
12	Food Technology: Reteach any benchmarks that need reteaching	Engineering Technology Unit 1 bm 3 and 4	Computer Technology Computer Software Reteach benchmarks that need reteaching
13	Summative Assessment		

STANDARD BASED LESSON PLANNING

What are Standards-Based Lessons?

In a Standards-Based Lesson, the most important or key distinction is that, a student is expected to meet a defined standard for proficiency. When planning a lesson, the teacher ensures that the content and the methods of teaching the content enable students to learn both the skills and the concepts defined in the standard for that grade level and to demonstrate evidence of their learning.

Planning lessons that are built on standards and creating aligned assessments that measure student progress towards standards is the first step teacher must take to help their students reach success. A lesson plan is a step-by-step guide that provides a structure for an essential learning.

When planning a standards-based lesson, teacher instructions are very crucial for your lessons. How teachers instruct the students is what really points out an innovative teacher to an ordinary teacher. Teacher must engage and prepare motivating instructional activities that will provide the students with opportunities to demonstrate the benchmarks. For instance, teacher should at least identify 3-5 teaching strategies in a lesson; teacher lectures, ask questions, put students into groups for discussion and role play what was discussed.

Why is Standards-Based Lesson Planning Important?

There are many important benefits of having a clear and organised set of lesson plans. Good planning allows for more effective teaching and learning. The lesson plan is a guide and map for organising the materials and the teacher for the purpose of helping the students achieve the standards. Lesson plans also provide a record that allows good, reflective teachers to go back, analyse their own teaching (what went well, what didn't), and then improve on it in the future.

Standards-based lesson planning is vital because the content standards and benchmarks must be comparable, rigorous, and measurable and of course evidence based and be applicable in real life that we expect students to achieve. Therefore, teachers must plan effective lessons to teach students to meet these standards. As schools implement new standards, there will be much more evidence that teachers will use to support student learning to help them reach the highest levels of cognitive complexity. That is, students will be developing high-level cognitive skills.

Planning for under-achievers

Under achievers are students who fail or do not perform as expected. Underachievement may be caused by emotions (low self-esteem) and the environment (cultural influences, unsupportive family). There may be other factors; however, as teachers your concern to ensure all students achieve a certain grade in their performance is normal. In the instance that you discover that one or a couple of your students are not performing to the expected level as their peers, you would need to do some fact finding of the causes and plan on how best to help this student/s improve their performances.

Helping underachievers

There are countless strategies you may choose from depending on your teaching experiences specifically to assist the under-achiever/s you have identified. It is good to bear in mind that underachievement varies between students. Not all students are in the same category of underachievement. Also it is important that underachieving students are addressed individually by focusing on the student's strengths.

Given here are suggested strategies teachers may adopt to assist underachievers in the classroom. They include:

- Examining the Problem Individually
- Create a Teacher-Parent Collaboration

Teachers and parents need to work together and pool their information and experience regarding the child. Teachers and parents begin by asking questions such as;

  * In what areas has the child shown exceptional ability?
  * What is the child's preferred learning style?
  * What insights do parents and teachers have about the child's strengths and problem areas?

- Help student to plan every activity in the classroom
- Help students set realistic expectations
- Encourage and promote the student's interests and passions.
- Help children set short and long-term academic goals
- Talk with them about possible goals.
- Ensure that all students are challenged (but not frustrated) by classroom activities
- Always reinforce students

Components of a Standards-Based Lesson Plan

An effective lesson plan has three basic components;

- objectives of the lesson;
- teaching and learning activities;
- assessments to check student understanding of the topic.

Effective teaching demonstrates deep subject knowledge, including key concepts, current and relevant research, methodologies, tools and techniques, and meaningful applications.

The standard based lesson plan has the following components. It is a must that the lessons teachers are teaching must be planned before actual delivery to the students.

The lesson components include :

1. Content Standard
2. Benchmark
3. Topic
4. Lesson Number and Title
5. Essential Questions
6. Lesson Objective
7. Essential KSAV
8. Teaching and Learning
    - *Introduction*
    - *Body- Modelling*
    - *Body –Guided Practice*
    - *Body -Independent practice*
9. Conclusion
10. Resources

Examples of Standards-Based Lesson Plans

To help teachers plan effective lessons, there is a sample lesson for the strand provided here. Teachers are encouraged to study the layout of the different components of this lesson and follow its design in their lesson preparation and teaching of lessons. Planning a good lesson helps the teacher in maintaining a standard teaching pattern and does not let the class deviate from the topic.

Standards-Based Lesson Planning

Planning a good lesson helps the teacher in maintaining a standard teaching pattern as a motivating factor to capture students' attention. To help teachers plan effective Textile Technology lessons, here is a grade 10 sample lesson from Unit 1 Fibres and Fabrics – Benchmark 11.1.1.1.
Teachers are encouraged to study the layout of the different components of these lessons and follow this design in their preparation and teaching of each lesson.

Sample of SBC Lesson Plan

Below displayed for your convenience is a sample of a Textile lesson specially done for a grade ten class. Teachers are encouraged to use this as a guide and write up their own lesson plans using the given template.

SAMPLE LESSON PLAN

STRAND 1 TEXTILE TECHNOLOGY

UNIT 1: FIBRES AND FABRIC

Content Standard: 1.1 Investigate the evolution, characteristics, designs and trends of the fabric and fabric design, their construction, production, representation, regulation and marketing.

Benchmark: 11.1.1.1: Display the process of the fashion design, construction, production and marketing of textiles and clothing.

Topic: **Textile design, production and marketing**

Lesson Title: Fashion design

Lesson Objective: By the end of this lesson students will;

- Define and differentiate fashion and design and
- Identify construction methods of textile items

Essential Questions

1. What is fashion?
2. What is design?
3. What is the difference between fashion and design?
4. How are textiles constructed?

Essential Knowledge Skills Values and Attitudes

Knowledge	Skills	Attitudes	Values
• Fashion design used in the globe	• Define and differentiate types of fashion designs	• Observe, accept, adapt famous fashions a/designs	• Respect, value changes in the designs

Teaching and Learning Strategies

Teacher will	Students will
Introduction (3 mins)	
Encourage response from students by: 1.Showing different kinds/types of textile items (clothing/household) in class asking them which is fashionable and attractive. 2. Ask essential questions; • why they made that choice of textile item? • what makes it attractive?	1. Choose the textile item they find attractive, stating their reasons for choosing them. 2. Discuss the styles or designs in the textile item that makes it preferable to the other (opinionative)
Body (30 mins)	
Modelling	
1.Teacher asks students to work in groups; - discuss and define fashion and design - how are designs done?	Students discuss and define fashion and design respectively and explain how designs are done.
Guided practice	
1.Teacher refers to the textile items and asks students to identify the; • type of fabric construction • styles, design pattern etc on item	Students ; • identify the fabric construction method; i.e. woven, knitted • sketch the design or style on A4 papers or butcher papers.
Independent Practice	
Teacher provides: • fabric and allows the students to do pin-up on a model (grp member) according to their sketches.	Students in groups use; • fabric and their sketches (designs) to pin-up one of their group members work as a model for their style or design.
Conclusion (7mins)	
Allow students to: • explain why they have chosen the style or design of pin-up they did.	Volunteers express themselves of their • interest on the design created • identify whether it is adapted or adopted.

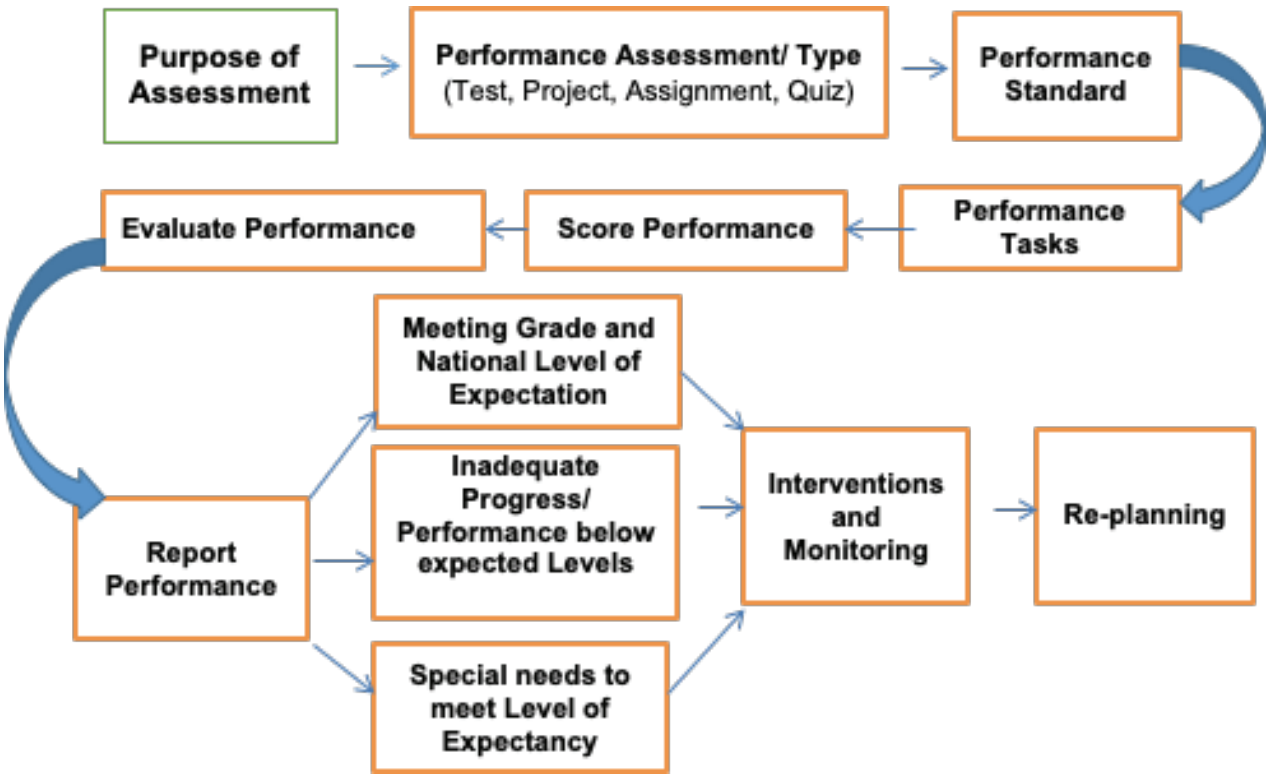
ASSESSMENT MONITORING & REPORTING

What is Standards-Based Assessment (SBA)?

Standards-Based Assessment is an on-going and a systematic process of **assessing**, **evaluating, reporting** and **monitoring** students' performance and progression towards meeting grade and national level expectations. It is the measurement of students' proficiency on a learning objective of a content standard and progression towards the attainment of that content standard and benchmark.

Standards-Based Assessment Cycle

The Standards-Based Assessment Cycle begins with the purpose to assess learning. Teachers must always clearly define the purpose and expectations of the assessment tasks or activities before starting the assessment. The cycle consists the delivery of the assessment, scoring of performance, monitoring or learning, evaluating learning and performance, reporting of achievement and underachievement, developing interventions for underachievers and advance learners and replanning assessment as demonstrated below;



Purpose of Standards-Based Assessment

Standards-Based Assessment (SBA) serves different purposes. These include instruction and learning purposes. The primary purpose of SBA is to improve student learning so that all students can attain the expected level of proficiency or quality of learning.

Enabling purposes of SBA is to:

- measure students' proficiency on well-defined content standards, benchmarks and learning objectives;
- ascertain students' attainment or progress towards the attainment of specific component of a content standard;
- ascertain what each student knows and can do and what each student needs to learn to reach the expected level of proficiency;
- enable teachers to make informed decisions and plans about how and what they would do to assist weak students to make adequate progress towards meeting the expected level of proficiency;
- enable students to know what they can do and help them to develop and implement strategies to improve their learning and proficiency level;
- communicate to parents, guardians, and relevant stakeholders the performance and progress towards the attainment of content standards or its components;
- compare students' performances and the performances of other students.

Principles of Standards-Based Assessment

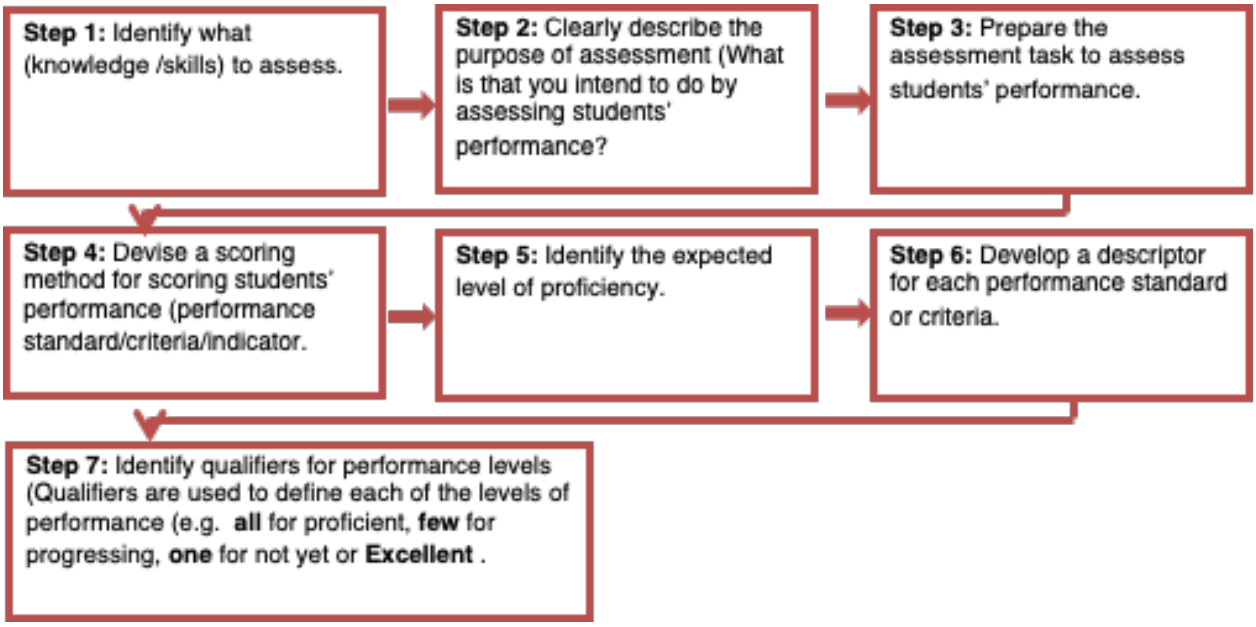
The principle of SBA is for assessment to be;

- emphasing on tasks that should encourage deeper learning.
- be an integral component of a course, unit or topic and not something to add on afterwards.
- a good assessment requires clarity of purpose, goals, standards and criteria.
- of practices that should use a range of measures allowing students to demonstrate what they know and can do.
- based on an understanding of how students learn.
- of practices that promote deeper understanding of learning processes by developing students' capacity for self-assessment.
- improving performance that involves feedback and reflection.
- on-going rather than episodic.
- given the required attention to outcomes and processes.
- be closely aligned and linked to learning objectives, benchmarks and content standards.

Standards-Based Assessment Process

Teachers are required to use the steps outlined below when planning assessment.

These steps will guide you to develop effective assessments to improve student's learning as well as evaluating their progress towards meeting national and grade – level expectations.



Authentic Assessment

Authentic Assessments in Standards-based (SBA) Assessment directly measure student's performance through "real life tasks" or "situations" that resemble "real life situations." Authentic assessment;

- Is performed in a real life context that approximates as much as possible, the use of a skill or concept in the real world.
- Is based on the development of a meaningful *product, performance or process.*
- Students develop and demonstrate the application of their knowledge, skills, values and attitudes in real life situations which promote and support the development of deeper levels of understanding.
- Is mostly associated with assessment as or while learning and assessment for learning but occasionally or contextually in summative learning.
- includes assessment activities such as demonstrations, debates, field work, simulations, problem solving, project-based learning, Poster Presentations, Research, Laboratory work, Reflections, Problem-based activities, Role Play, Report/Essay, Field experience, Field report, Recounts etc.

Advantages of Authentic Activities

- Empower students to take ownership in their learning.
- Appreciates Learning experience.
-
- enables and encourages the Learning experiences to be used as a basis of learning.
- Meaningful, relevant, practical.
- Assess the actual learning experience which means; you do not need to "teach" and then assess, rather you assess actual learning experience while it is actually happening.

Authentic Assessment Criteria

In SBA, teachers are encouraged to step out of their traditional assessment and explore authentic assessment. The criteria in authentic assessment.

- Looks at students actively engaged in completing a task that represents the achievement of a learning objective or standard.
- Takes place in real life situations.
- Asks students to apply their knowledge, skills, values and attitudes in real life situations.
- Students are given the criteria against which they are being assessed.

A Comparison of Authentic and Traditional Assessment

Authentic Assessments	Traditional Assessments
• Portfolios, demonstrations, field work, case studies, assignments, lab reports • Students take an active role in process • Qualitative • Interpretive • Focuses on performance, process and product • High level thinking • Use of rubric • Use of criterion levels evaluation • Part of teaching and learning Process • Shows mastery and learning performance • Generally extends over time	• Multiple choice tests, true-false, fill in the blanks, sentence completion, matching, diagram completions • External –(teacher driven – assessing performance of teacher rather than the student) • Teacher-centered (what is appropriate and convenient for the teacher and what teacher thinks is good for students and decides what should be and should not be learnt) • Quantitative (driven to collect marks) • Objective • End product (only looking for the end product and not concerned about the performance and process) • Standardized or norm referenced • Isolated facts • Low level content • Generally occurs in “one setting

Standards-Based Assessment Types

In SBA, there are three broad assessments types. These assessment types are applicable across all subjects and in all grade levels.
These elaborations on each assessment type will help you understand the assessment type and create your assessment performance task for whichever benchmark a teacher may intend to do assessment on.

1. Formative Assessment

Formative assessment includes ‘assessment *for* and *as’* and is conducted during the teaching and learning of activities of a topic.

Purposes of assessment for Learning

- On-going assessment that allows teachers to monitor students on a day-to-day basis.
- Provide continuous feedback and evidence to the teachers that should enable them to identify gaps and issues with their teaching, and improve their classroom teaching practice.
- Helps students to continuously evaluate, reflect on, and improve their learning

Purposes of assessment as Learning

- Occurs when students reflect on and monitor their progress to inform their future learning goals
- Helps students to continuously evaluate, reflect, and improve their own learning
- Helps students to understand the purpose of their learning and clarify learning goals

2. Summative Assessment

Summative assessment focuses on '*assessment of learning'* and is cconducted after or at the conclusion of teaching and learning of activities or a topic.

Purposes of assessment of Learning

- Help teachers to determine what each student has achieved and how much progress he/she has made towards meeting national and grade-level expectations
- Help teachers to determine what each student has achieved at the end of a learning sequence or a unit.
- Enable teachers to ascertain each student's development against the unit or topic objectives and to set future directions for learning.
- Help students to evaluate, reflect on, and prepare for next stage of learning

Performance Assessment

Performance assessment is a form of testing that requires students to perform a task rather than select an answer from a ready-made list. For example, a student may be asked to explain historical events, generate scientific hypotheses, solve math problems, converse in a foreign language, or conduct research on an assigned topic. Teachers, then judge the quality of the student's work based on an agreed-upon set of criteria. It is an assessment which requires students to demonstrate that they have

mastered specific skills and competencies by performing or producing something.

Types of performance assessment;

1. Products-Oriented

This refers to concrete tangible items that students create through either the visual, written or auditory media such as;

- Creating a health/physical activity poster
- Video a class game or performance and write a broadcast commentary
- Write a speech to be given at a school council meeting advocating for increased time for health and physical education in the curriculum
- Write the skill cues for a series of skill photo's
- Create a brochure to be handed out to parents during education week
- Develop an interview for a favourite sportsperson
- Write a review of a dance performance

- Essays
- Projects

Performances-Oriented

It deals with observable affective or psycho-motor behaviours put into action such as;

- Skills check during game play
- Role plays
- Officiating a game
- Debates
- Performing dance/gymnastics routines
- Teaching a skill/game/dance to peers

Assessment Strategies

It is important for teachers to know that, assessment is administered in different ways. Assessment does not mean a test only. There are many different ways to find out about student's strengths and weaknesses. Relying on only one method of assessing will not reflect student's achievement.

Provided in the appendices is a list of suggested strategies you can use to assess student's performances. These strategies are applicable in all the standards-based assessment types.

Performance Standards

Performance standards are measurement standards that are observed through evidence outcomes and performance indicators. Evidence outcomes and Performance Indicators are used to measure students' performances, proficiency, competency, progression and achievement of the desired grade or level of expectation.

Performance Standards are concrete statements of how well students must learn what is set out in the content standards and benchmarks, often called the "be able to do" of "what students should know and be able to do." Performance standards indicate the quality that specifies how competent a students' demonstration or performance must be. They include explanations of how well students must demonstrate the content, explaining "how good is good enough."

Performance standards:

- measure students' performance and proficiency (using performance indicators) in the use of a specific knowledge, skill, value, or attitude in real life or related situations.
- provide the basis (performance indicators) for evaluating, reporting and monitoring students' level of proficiency in use of a specific knowledge, skills, value, or attitude.
- are used to plan for individual instruction to help students not yet meeting expectations (desired level of mastery and proficiency) to make adequate progress towards the full attainment of benchmarks and content standards.

- are used as the basis for measuring students' progress towards meeting grade-level benchmarks and content standards.
- A stem statement for Performance Standards will begin with…."Students will be able to……"
- A stem statement for Performance Indicator will begin with …."Students can be able to……."

Assessment Strategies

It is important for teachers to know that, assessment is administered in different ways. Assessment does not mean a test only. There are many different ways to find out about student's strengths and weaknesses. Relying on only one method of assessing will not reflect student's achievement.
Provided in the appendices is a list of suggested strategies you can use to assess student's performances. These strategies are applicable in all the standards-based assessment types.
Teachers can choose from these assessment strategies and plan suitable assessment activities for their students:

Strategy	Description
Analogies	Students create an analogy between something they are familiar with and the new information they have learned. When asking students to explain the analogy, it will show the depth of their understanding of a topic.
Classroom Presentations	A classroom presentation is an assessment strategy that requires students to verbalize their knowledge, select and present samples of finished work, and organize their thoughts about a topic in order to present a summary of their learning. It may provide the basis for assessment upon completion of a student's project or essay.
Conferences	A conference is a formal or informal meeting between the teacher and a student for the purpose of exchanging information or sharing ideas. A conference might be held to explore the student's thinking and suggest next steps; assess the student's level of understanding of a particular concept or procedure; and review, clarify, and extend what the student has already completed
Discussions	Having a class discussion on a unit of study provides teachers with valuable information about what the students know about the subject. Focus the discussions on higher level thinking skills and allow students to reflect their learning before the discussion commences.
Essays	An essay is a writing sample in which a student constructs a response to a question, topic, or brief statement, and supplies supporting details or arguments. The essay allows the teacher to assess the student's understanding and/or ability to analyse and synthesize information.
Exhibitions/ Demonstrations	An exhibition/demonstration is a performance in a public setting, during which a student explains and applies a process, procedure, etc., in concrete ways to show individual achievement of specific skills and knowledge.

Interviews	An interview is a face-to-face conversation in which teacher and student use inquiry to share their knowledge and understanding of a topic or problem, and can be used by the teacher to explore the student's thinking; assess the student's level of understanding of a concept or procedure and gather information, obtain clarification, determine positions, and probe for motivations.
Learning Logs	A learning log is an ongoing, visible record kept by a student and recording what he or she is doing or thinking while working on a particular task or assignment. It can be used to assess student progress and growth over time.
Observation	Observation is a process of systematically viewing and recording students while they work, for the purpose of making programming and instruction decisions. Observation can take place at any time and in any setting. It provides information on students' strengths and weaknesses, learning styles, interests, and attitudes.
Peer Assessment	Assessment by peers is a powerful way to gather information about students and their understanding. Students can use set criteria to assess the work of their classmates.
Performance Tasks	During a performance task, students create, produce, perform, or present works on "real world" issues. The performance task may be used to assess a skill or proficiency, and provides useful information on the process as well as the product.
Portfolios	A portfolio is a collection of samples of a student's work, and is focused, selective, reflective, and collaborative. It offers a visual demonstration of a student's achievement, capabilities, strengths, weaknesses, knowledge, and specific skills, over time and in a variety of contexts.
Questions And Answers (Oral)	In the question–and-answer strategy, the teacher poses a question and the student answers verbally, rather than in writing. This strategy helps the teacher to determine whether students understand what is being, or has been, presented, and helps students to extend their thinking, generate ideas, or solve problems.
Quizzes, Tests, Examinations	A quiz, test, or examination requires students to respond to prompts in order to demonstrate their knowledge (orally or in writing) or their skills (e.g., through performance). Quizzes are usually short; examinations are usually longer. Quizzes, tests, or examinations can be adapted for exceptional students and for re-teaching and retesting.
Questionnaires	Questionnaires can be used for a variety of purposes. When used as a formative assessment strategy, they provide teachers with information on student learning that they can use to plan further instruction.
Response Journals	A response journal is a student's personal record containing written, reflective responses to material he or she is reading, viewing, listening to, or discussing. The response journal can be used as an assessment tool in all subject areas.
Selected Responses	Strictly speaking a part of quizzes, tests, and examinations, selected responses require students to identify the one correct answer. The strategy can take the form of multiple-choice or true/false formats. Selected response is a commonly used formal procedure for gathering objective evidence about student learning, specifically in memory, recall, and comprehension.

Student Self-Assessments	Self-assessment is a process by which the student gathers information about, and reflects on, his or her own learning. It is the student's own assessment of personal progress in terms of knowledge, skills, processes, or attitudes. Self-assessment leads students to a greater awareness and understanding of themselves as learners.

Assessment Strategies and Action Verbs

The table below gives teachers some action verbs that can be used in the application of a particular assessment strategy he or she choose to use in assessing the students' performance

Action Verbs to Assessment Strategies		
Cognitive Learning	**Action Verbs**	**Assessment Strategies**
Knowledge □ to recall or remember facts without necessarily understanding them	Arrange, define, duplicate, label, memorise, name, order, recognise, relate, recall, reproduce, list, tell, describe, identify, show, label, collect, examine, tabulate, quote	• Prior knowledge inventory, misconception/preconception check • Focused listing, empty outlines • Pre□post test, quiz, quick poll
Comprehension – to understand and interpret learned information	Classify, describe, discuss, explain, express, interpret, contrast, predict, associate, distinguish, estimate, differentiate, discuss, extend, translate, review, restate, locate, recognise, report	• Minute paper, muddiest (or clearest) point • Observe &evaluate a student artifact or performance task using a rubric • Directed paraphrasing • Pre□post test, quiz • Interviews
Application – to put ideas and concepts to work in solving problems	Apply, choose, demonstrate, dramatise, employ, illustrate, interpret, operate, practice, schedule, sketch, solve, use, calculate, complete, show, examine, modify, relate, change, experiment, discover	• Observe and evaluate a student artefact, performance, or task using a rubric • Directed paraphrasing, real□world application (apply learning in a new context) • Test, quiz • Job/internship evaluate, skill ratings

Analysis – to break information into its components to see interrelationships and ideas	Analyse, appraise, calculate, categorise, compare, contrast, criticise, differentiate, discriminate, distinguish, examine, experiment, question, test, separate, order, connect, classify, arrange, divide, infer	• Pro and con grid, categorizing grid, compare and contrast, concept maps • Observe and evaluate a student artifact, performance, or task using a rubric • Journaling • Job/internship evaluation, skill ratings
Evaluation – to judge the value of information based on established criteria	Appraise, argue, assess, attach, defend, judge, predict, rate, support, evaluate, recommend, convince, judge, conclude, compare, summarise	• Reflection component of a portfolio or experience • Journaling • Peer evaluation
Affective Learning	appreciate, accept, attempt, challenge, defend, dispute, join, judge, praise, question, share, support	• Reflection component of a portfolio or experience • Journaling • Observe and evaluate group work • Surveys, interviews, focus groups

Scoring Methods for Performance Assessment

Assessment can be scored during or after the students have completed the assessment task. However, it is best done during a lesson- using a checklist, rating scales & rubrics.

A rubric is a coherent set of criteria for students' work that includes descriptions of levels of performance quality on the criteria. Rubrics have two major aspects: coherent sets of criteria and descriptions of levels of performance. Rubrics include;

(1) Descriptions of the of task
(2) The scales to be used
(3) The dimensions of the task
(4) The description of each dimension on the scale

A Rubric

- is a scoring guide that helps teachers evaluate student performance, based on a range of criteria.
- A rubric lists the criteria, or characteristics, that student work should exhibit and describes specific quality levels for those criteria.

- Rubrics are a great way to improve communication, learning, and grading
- fairness.
- Knowing how to create and use rubrics gives you a better understanding of assessment and another option for assessing student performance.
- are descriptive and not evaluative.
- Of course, rubrics can be used to evaluate, but the operating principle is to match
-
- the performance to the description rather than “judge” it.
- Thus rubrics are as good or bad as the criteria selected and the descriptions of the levels of performance under each.
- Effective rubrics have appropriate criteria and well-written descriptions of performance.

Purpose of Rubrics

Like any other evaluation tool, rubrics are useful for certain purposes and not for others. *The main purpose of rubrics is to assess performances*. For some performances, you observe the student in the process of doing something, like using an electric drill or discussing an issue. For other performances, you observe the product that is the result of the student’s work, like a finished bookshelf or a written report.

1. Support authentic assessment

While traditional tests measure how well students recall content, rubrics measure how well students can apply knowledge to authentic contexts or real-world tasks.

2. Clearly communicate expectations

Because rubrics define student “quality” in terms of objective criteria and standards, they clearly communicate how instructors will evaluate student performance.

3. Improve performance

Rubrics lead to better student performance. When students understand assignments and expectations before they begin, they are more likely to fulfil them. They know what specific criteria and standards of excellence will be used to rate their performance.

4. To inspire fairness

Because rubrics have detailed assessment information, students don’t feel that grades are assigned subjectively or arbitrarily. Also, when you have more than one grader, a rubric allows all graders to apply the same criteria in the same way.

Although rubrics have many benefits--and make grading faster and easier--a good rubric takes time, effort and patience to construct. You’ll probably need to change (change, not add to) your grading and assessment methods, based on what you believe about learning assessment. Rubrics are best for critical assessments,

major projects, and other assignments that require a multi-dimensional performance evaluation. The trick is to know what type of rubric to create for your situation.

Reasons for Creating Rubrics/Marking schemes

Rubrics or marking schemes are created for;

1. Categories to assess-different components or elements that will assess
    - Factual information
    - Application
    - Analysis
    - Writing Skills

2. Criterion for assessment
    - Accuracy
    - Completeness
    - Length or number of examples
    - Supported with research
    - Range of answer
    - Description and support

3.Levels or points 3-5 levels
    - Exemplary. Proficient, acceptable, not acceptable
    - Excellent, good, fair, poor
    - 10 points, 5 points, 1 point

Parts of a Rubric

- A rubric is a matrix of criteria and their descriptors.
- The left side of a rubric matrix lists the **criteria (performance standards)** for the expected product or performance.
- Across the top of the rubric matrix is the **rating scale** that provides a set of values for rating the quality of performance for each criterion.
- **Descriptors** under the rating scale provide examples or concrete indicators for each level of performance.
- The dimensions of the task that **qualifies** the achievement

Criteria	Performance Standards (Descriptors)
BEYOND	**Beyond Standard (s) -*Advanced in Performance and Understanding***
	Consistently demonstrates advanced conceptual mathematical understandings Consistently generates tasks that make connections between and among mathematical ideas Consistently applies strategies to unique situations Consistently demonstrated confidence to approach tasks beyond the proficiency level for grade Consistently initiates mathematical investigations
CONSISTENT	**Meet Standard (s)-*Proficient in Performance and Understanding***
	Consistently demonstrates understanding of mathematical standards and cluster at the grade level Consistently demonstrated conceptual understanding Consistently applies multiple strategies flexibly in various situations Understands and fluently applies procedures with understanding Consistently demonstrates perseverance and precision Constructs logical mathematical arguments of thinking and reasoning Uses mathematical language correctly and appropriately
INCONSISTENT	**Progressing-*Not Yet Proficient in Performance and Understanding***
	Inconsistently uses tools appropriately and strategically Demonstrates inconsistent understanding of key mathematical ideas at grade level Demonstrates inconsistent conceptual understanding of key mathematical ideas at grade level Inconsistent in understanding and application of grade level appropriate strategies Depends upon assistance of teacher and/or peers to understand and complete tasks Needs additional time to complete tasks Applies models of mathematical ideas inconsistently

SELDOM	**Not Yet *-Limited Performance and Understanding***
	Exhibits minimal understanding of key mathematic ideas at grade level Rarely demonstrates conceptual understanding Seldom provides precise response Seldom use appropriate strategies Consistently requires assistance and alternative instruction Use tools inappropriately to model mathematics

Types of Rubrics

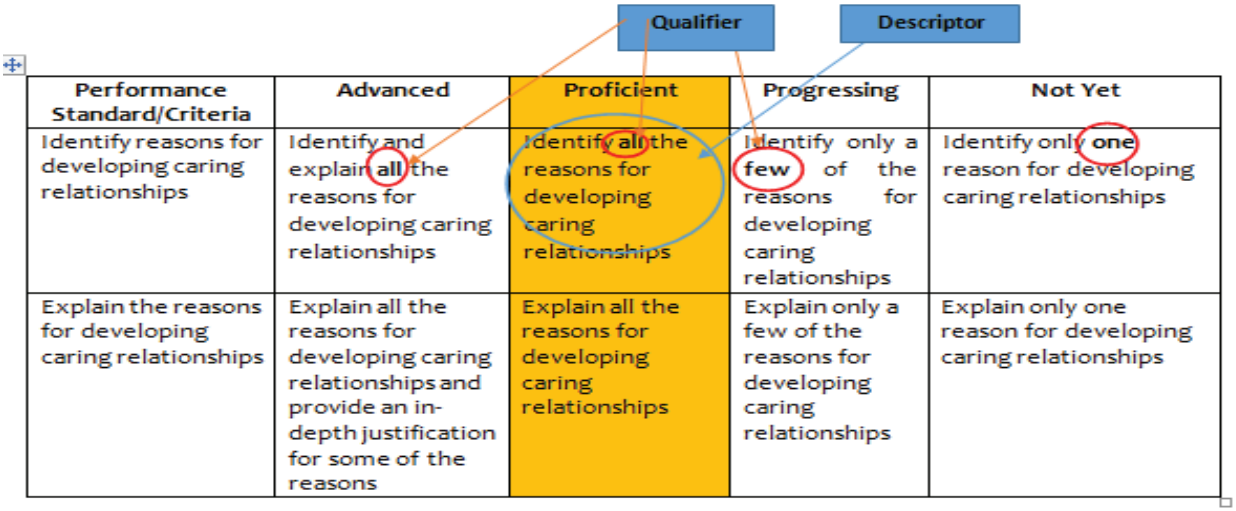
1. Analytic Rubric

Analytic rubrics describe work on each criterion separately. For most classroom purposes, analytic rubrics are best. Focusing on the criteria one at a time is better for instruction and better for formative assessment because students can see what aspects of their work need what kind of attention. Focusing on the criteria one at a time is good for any summative assessment (grading) that will also be used to make decisions about the future—for example, decisions about how to follow up on a unit or decisions about how to teach something next year.

Template for Analytic Rubrics

Criteria	Beginning	Developing	Accomplished	Exemplary	Score
Criteria 1	Description reflecting beginning	Description reflecting movement toward mastery level of performance	Description reflecting achievement of mastery level of performance	Description reflecting of highest level of performance	
Criteria 2	Description reflecting beginning level performance	Description reflecting movement toward mastery level of performance	Description reflecting achievement of mastery level of performance	Description reflecting of highest level of performance	
Criteria 3	Description reflecting beginning level performance	Description reflecting movement toward mastery level of performance	Description reflecting achievement of mastery level of performance	Description reflecting of highest level of performance	
Criteria 4	Description reflecting beginning level performance	Description reflecting movement toward mastery level of performance	Description reflecting achievement of mastery level of performance	Description reflecting of highest level of performance	

Sample Analytic Rubric



Performance Standard/Criteria	Advanced	Proficient	Progressing	Not Yet
Identify reasons for developing caring relationships	Identify and explain **all** the reasons for developing caring relationships	Identify **all** the reasons for developing caring relationships	Identify only a **few** of the reasons for developing caring relationships	Identify only **one** reason for developing caring relationships
Explain the reasons for developing caring relationships	Explain all the reasons for developing caring relationships and provide an in-depth justification for some of the reasons	Explain all the reasons for developing caring relationships	Explain only a few of the reasons for developing caring relationships	Explain only one reason for developing caring relationships

Holistic Rubrics

Holistic rubrics describe the work by applying all the criteria at the same time and enabling an overall judgment about the quality of the work. Holistic rubrics are based on criteria for good work and on observation of how the work meets those criteria.

One classroom purpose for which holistic rubrics are better than analytic rubrics is the situation in which students will not see the results of a final summative assessment and you will not really use the information for anything except a grade. Some

high school final examinations fall into this category. Grading with rubrics is faster when there is only one decision to make, rather than a separate decision for each criterion.

Decide on type of rubric to be used (Holistic or Analytic)

1. When to use Holistic Rubric
    - There is no single correct answer/response to a task
    - The focus has no the overall quality, proficiency, or understanding of a specific content or skills.
    - You are assessing large numbers (eg. 150 portfolios)

Holistic Rubric						
Score	5	4	3	2	1	0
Description	Demonstrate **complete** understanding of the problem. **All** requirements of task are **included in response**.	Demonstrate **considerate** understanding of the problem. **All** requirements of task are **included**.	Demonstrate **partial** understanding of the problem. **Most** requirements of task are **included**.	Demonstrate **little** understanding of the problem. **Many** requirements of task are **missing**.	Demonstrate **no** understanding of the problem.	**No** response/ **not** attempted task

2.When to use Analytic Rubric

- Several subjects are assessing the student work.
- Description promote consistent scoring.
- Stakeholders will be examining the rubric scores.
- Substantial feedback to students or the subjects is desired.
- Outlines of specific strengths/weaknesses are anticipated.

Analytic Rubric				
Criteria	4	3	2	1
Criteria # 1	Description reflecting **highest** level of performance.	Description reflecting **mastery** level of performance.	Description reflecting **movement towards** mastery level of performance.	Description reflecting **beginning** level of performance.
Criteria # 2	Description reflecting **highest** level of performance.	Description reflecting **mastery** level of performance.	Description reflecting **movement towards** mastery level of performance.	Description reflecting **beginning** level of performance.
Criteria # 3	Description reflecting **highest** level of performance.	Description reflecting **mastery** level of performance.	Description reflecting **movement towards** mastery level of performance.	Description reflecting **beginning** level of performance.
Criteria # 4	Description reflecting **highest** level of performance.	Description reflecting **mastery** level of performance.	Description reflecting **movement towards** mastery level of performance.	Description reflecting **beginning** level of performance.

Scoring of Performance for Formative Assessment
(Assessment as/while learning and Assessment for learning)

1. Scoring Assessment using Rating Scale

Rating Scales are a type of checklists that judge the degree to which a criteria is met. They generally have a scale of between 1-6 options.

Types of Rating Scales

A. Frequency Rating Scales

A frequency rating scale scores how often a task is done to meet criteria.

Sample Rating Scale Descriptive Words

1. Words that describe the skill of ***selecting 'the right' information*** at varying levels of quality.

Excellent	Proficient	Adequate	Limited
pertinent	relevant	suitable	trivial
insightful	meaningful	appropriate	superficial
significant	relevant	predictable	vague
perceptive	thoughtful	basic	questionable
precise	logical	partially correct	confusing
purposeful	focused	appropriate	irrelevant

2. Words that describe the skill of ***selecting 'enough' information*** at varying levels of quality.

Excellent	Proficient	Adequate	Limited
comprehensive	thorough	cursory	superficial
in-depth	sufficient	partial	incomplete
rich & detailed	specific	simplistic	undeveloped
extensive	substantial	partial	sketchy

3. Words that describe the skill of ***evaluating product or connecting insights to personal experience*** at varying levels of quality.

Excellent	Proficient	Adequate	Limited
insightful	thoughtful	predictable	trivial
astute	relevant	appropriate	unfocused
perceptive	thoughtful	routine	trivial
intuitive	logical	rudimentary	unsubstantiated
innovative	credible	predictable	trite
compelling	meaningful	obvious	tenuous

4. Words that describe the skill of ***designing or constructing*** at varying levels of quality.

Excellent	Proficient	Adequate	Limited
efficient	practical	viable	unworkable
innovative	effective	workable	ineffective

5. Words that describe the skill of ***organizing or formatting information*** at varying levels of quality.

Excellent	Proficient	Adequate	Limited
Skillful	systematic	simplistic	haphazard
purposeful	logical	methodical	disorganized

6. Words that describe the skill of ***analyzing information or data*** at varying levels of quality.

Excellent	Proficient	Adequate	Limited
accurate	logical	partially accurate	flawed
insightful	logical	simplistic	unsupported
Astute	credible	plausible	inaccurate
Precise	relevant	basic	irrelevant

7. Words that describe the skill of ***presenting or communicating information or selecting appropriate visuals*** at varying levels of quality.

Excellent	Proficient	Adequate	Limited
Vivid	interesting	simplistic	lacks appeal
compelling	effective	predictable	does little to sustain interest
enhances	supports	partially supports	interferes with
engaging	interesting	straightforward	ineffective
Skillful	effective	appropriate	inappropriate
intriguing	interesting	predictable	ineffective

Sample Scoring using Rating Scale to assess ***"Collaboration."***

Criteria	Frequency			
	Always = 4	**Sometimes = 3**	**Rarely = 2**	**Never - 1**
1. Embraces everyone's' abilities and encourages participation	Always Embraces everyone's' abilities and encourages participation	Sometimes Embraces everyone's' abilities and encourages participation	Rarely Embraces everyone's' abilities and encourages participation	Never Embraces everyone's' abilities and encourages participation
2. Ensures everyone is tasked to and activity	Always Ensures everyone is tasked to and activity	Sometimes Ensures everyone is tasked to and activity	Rarely Ensures everyone is tasked to and activity	Never Ensures everyone is tasked to and activity
3. Encourages everyone to achieve together	Always Encourages everyone to achieve together	Sometimes Encourages everyone to achieve together	Rarely Encourages everyone to achieve together	Never Encourages everyone to achieve together

2. Scoring assessment using a Checklist

Check lists are one of the easiest methods of scoring assessment tasks. The criteria i.e. skills, cues or tasks are considered separately according to whether they have been accomplished.

Types of Checklists include

- Yes/No
- Tick/Cross
- Circling
- Narrow scale, e.g. Sometimes, rarely, never
- Colouring
- Symbols (signifiers), e.g. pictures, facials, artifacts, signs, drawings, concept maps)
-

Sample Scoring using Yes/No Checklist Scale to assess ***"Collaboration."***

No	***Criteria***	***Write Yes (score 2) or No (score 1)***
1	*Embraces everyone's' abilities and encourages participation*	
2	*Ensures everyone is tasked to an activity*	
3	*Encourages everyone to achieve together*	

Sample Scoring using Tick/Cross Checklist Scale to assess "Collaboration"

No	*Criteria*	*Place a tick(score 2) or and X (score 1)*
1	*Embraces everyone's' abilities and encourages participation*	
2	*Ensures everyone is tasked to an activity*	
3	*Encourages everyone to achieve together*	

Assessment Components and Task Weighting

The Assessment components and Task Weighting is intended for a Termly Assessment Schedule. It anticipated that the assessment components with their weightings may be changed by the teachers'
Business Studies Termly Teaching Programs accordingly but the total scores allocated for the THEORY ASSESSMENT COMPONENTS (TAC) of 40 Marks and PRACTICAL ASSESSMENT COMPONENTS (PAC) 60 Marks should remain as it is the determined as the required 40/60 Moderation Components (i.e. 100 marks) for Business Studies Assessments per Assessment Period.

THEORY ASSESSMENT COMPONENTS (TAC) **(40 Marks)**	**TOTAL SCORE/100**	**PRACTICAL ASSESSMENT COMPONENTS (PAC)** **(60 Marks)**	**TOTAL SCORE/100**
		Project Portfolio No. 1	10
		STEAM Project Portfolio No. 1	10
Test No. 1	15	Project No. 1	25
		STEAM Project No. 1	25
Assignment No. 1	10		
Test No. 2	15		
TOTAL THEORY SCORE	**____/40**	**TOTAL PRACTICAL SCORE**	**____/60**
TOTAL SCORES OF TAC + PAC **= TOTAL SCORES OUT OF 100**	**_____/100**		

SAMPLE SUBJECT ASSESSMENT STRUCTURE

The internal assessment for the Technology and Industrial Arts/ subject is based on the Grade 9 & 10 and Grade 11 and 12 Technology and Industrial Arts Syllabus. The final assessment should be based on a range and balance of assessment strategies and instruments. Assessment must be both normative and criterion.

Component	Weighting	Tasks	Assessment Referencing
Practical Work in response to design brief (Moderation and Projects included here?)	60 % (of mandatory total)	Development and application of design ideas, safe and skillful use of materials, tools and equipment to make a product and the identified processes	Criterion Referencing Rubrics?
Design folio with outcomes of research , investigations and planning	20 % (of mandatory total)	Folio showing results of investigation in response to design brief, rough notes or sketches of design ideas, timelines, final drawings or plans, processes used to make the product and evaluation reports	Criterion Referencing Rubrics?
Tests	20 %(of mandatory total)	Theory and also applications in theory	Normative
Marks	100 %	A combination of design folios, practical applications, moderations and tests.	

Sample Assessment

SBC embraces standards and as such, standards must also drive the administration of assessments to students. It is important that every student must be given the outline of the Assessment that has been planned for the term. Each Term will include 6 pieces (can have any number from 4-6) of assessment. Assessment is weighted accordingly.

Assessment Type	Description	Weighting
Topic Tests x 2	Students will be given two topic tests based on the content learnt in the term. 1 will be given mid-term and 1 at end-term. The test will be comprised of 10 multiple choice questions and 5 short written answers.	1 = 15 marks 1=10 marks
Portfolio	Individual Students will be assessed……	10 marks
Moderation	In groups of four - five, students work to critically engage with one another in the required design process. Students will address criteria provided in class and prepare and deliver a 5-10 minute presentation addressing the criteria.	30 marks
Project (Application)	In groups of three to four, students work to critically engage with one another in the assigned project. Sudents will address criteria provided in class and prepare and deliver a 5-10 minute presentation addressing the criteria.	20 marks
Participation	2 marks will be allocated each day for attendance. Another 3 marks will be awarded for active participation.	5 marks

Sample Termly Assessment Plan/Outline

Provided below is a sample Termly Assessment Plan. All the Assessments must be represented in the Assessment plan which must also be communicated to students You are encouraged to use it only as a guide to assist you plan your subject, grade, classroom or school assessment

Sample Termly Assessment Plan/Outline (Insert a statement: this is a sample to see not to follow and attached in the appendices)
Teaching Program

Term: One **Subject:** Textile **Grade:** 10

WEEKS	STRANDS	UNITS	C/STAN-DARDS	BENCH-MARKS	Learning Objectives: By the end of the lesson the students be able to;	Top-ics	Knowl-edge	Skills	Attitude/ Values	As-sess-ments

Assessment Performance Records for Term to give grading

Student's performance in any assessments must be recorded to obtain a final score to be able to give a grading.
Subject/Strand: _____Grade/Class:_____ Term____

NO	Name	Proj-ect 20 marks	Test 1 15 marks	Test 2 10 marks	Portfo-lio 10 marks	Modera-tion 30 marks	Partici-pation 5 marks	Total Raw Score
1	Gill							/ 100
2	Jill							/ 100
3	Zill							/ 100
4	Bill							/ 100
Etc.								/ 100

STEAM Assessment

Steps in Developing a STEAM Activity

1. Identify the Real/Authentic Situations that can be solved through the STEAM Activity
2. Select a well-defined a Benchmark in your subject area that will carry the STEAM Activity
3. Identify related subject areas with their concepts to be used solve the Authentic Situation
4. Note down the Main parts of the Unit Of Work for the STEAM Activity
5. Write a Description of the Authentic Situation for the STEAM Activity based on the identified Authentic situation.
6. Write down the Task Descriptions for the STEAM Activity in order to approach the Authentic situation.
7. Develop the Rubric to Assess the STEAM Activity

1. Authentic Situation identified for this STEAM Activity

- Students spending too much time using their smart mobile phones on Facebook, WhatsApp and surfing the internet rather than their school work.
- Students still bringing their smart mobile phones to school despite the school rules telling them not to.
- Most schools need to fully utilise their School Rules, Mottos, Missions and Visions which determines the way they want to shape our students' Knowledge, Attitudes and Values, during and after, they leave the school at end of G10 and G12.
- Our schools in our country have been labelled as 'a very good school to a very bad school' due school student fightings and vandalism of school properties.
- Stakeholders of the schools are blaming the school management for the school students behaviour problems and parents are transferring their students out of schools to others school in the country.

2. Select a well-defined Benchmark in your subject area that will carry/drive the STEAM Activity and its associated Big Idea (product, project etc.)

- Sample:

  i. SUBJECT: BUSINESS STUDIES

  ii. BENCHMARK 9.2.5.1. Analyse the impact of information technology on society.

  iii. BIG IDEA/PRODUCT: Video Clip

3. Identify other related subject areas with the appropriate concepts to solve the Authentic Situation(s)

- Identify related subject areas with their concepts/Knowledge, Skills, Attitudes and Values to be used to solve the Steam Authentic Situation

SUBJECTS	BENCHMARKS	BIG IDEA/ PRODUCT	KNOWLEDGE	SKILLS	ATTITUDES	VALUES
1. Arts (Theatre Arts)	9.2.2.2		Video script	Script Writing		
2. Christian Civic Value Education (CCVE)	9.3.1.3		School Rules, Motto, Vision, Mission	Examine Civic values	Responsibility	Ownership, Love
3. Character Social Development (CSD)	9.1.5.1, 9.1.5.2, 9.1.5.3, 9.1.5.4, 9.1.5.5		School Rules, Motto, Vision, Mission	Asses experiences and mistakes	Caring, Positivity	Respect
4. English	9.2.2.1		Descriptive Writing	Descriptive Writing	Neatness	
5. Social Science (History)	9.2.2.3, 9.2.2.4		School history	Discuss school culture		Ownership
6. Social Science (Political Science)	9.3.3.1, 9.3.3.2		National development aspirations/demands of citizens	Anticipative skills		
7. Technology Industrial Arts (TIA)	9.4.1.4, 9.4.1.5, 9.4.1.6		Range of communications media products	Creative media communication	Alertness	
8. Business Studies	9.2.5.6.	Video clip	Media rich projects	Shooting with mobile	Creativity	Innovative

There must be an anchor subject benchmark for any STEAM assessment.

4. Descriptions of the Steam Authentic Situation

- Paragraph 1 describes the problem/situation
- Paragraph 2 describes the solution to the problem/situation and who will be responsible to take up the task
- Paragraph 3 would mention any rewards/awards for an adequate solution to the problem/situation as a booster to create a competitive competition and a promoter of critical thinking amongst the students so that they can come out with the best products.

5. Write down the Task Descriptions for the STEAM Activity

- Plan and write a short write-up for your video-clip.

- Use the notes to Make a 2-minute video clip to advertise and market your school to the public.
- The short video clip must embrace the school rules, motto, and mission and vision statements.
- It must also contain messages of new and competent management.
- This video clip has to have the potential to positively change the image of the school
- This 2-miunte video clip must be captivating and totally convincing to attract students to want to enroll at your school.
- This clip must not be more than 2 minutes (maximum time limit).
- Present your video clip to be assessed.
- Submit both your write-up (on a chart) together with your video clip.

6. Developing Rubrics to Assess the Steam Video Clips

1. Decide on type of rubric to be used (Holistic or Analytic).
2. Decide what point scale rubric to use (always use 3, 4 or 5 point-scale) and rating scales to use (descriptive words or numerals).
3. Plan the layout to develop the rubric.
4. Decide what to assess from the Category of Tasks Description.
5. Identify and List down the Category of Tasks Description for the Criteria.
6. Reword the Tasks Descriptions to create Criteria.
    - Plan and write a short write-up for your video-clip. (***The write up of the video***).
    - Use the notes to make a 2-minute video clip to advertise and market your school to the public. (***The development of the video***).
    - The short video clip must embrace the school rules, motto, and mission and vision statements. (***The content of the video.***)
    - It must also contain messages of new and competent management. (***The content of the video***).
    - This clip must not be more than 2 minutes (maximum time limit) (***The presentation of the video***).
    - Submit both your write-up (on a chart) together with your video clip. (***The product***)
7. List the criteria against the Task Descriptions in a table.
8. Unpack the Task Descriptions and Identify the essential KSAV that can be assessed.
9. Reword the Task Descriptions with the inclusion of KSAVs into a Descriptor statement for each criteria and distribute into each Competency Level/Levels of Achievement.
10. Determine appropriate variance of Qualifiers for each Descriptors of each Achievement Level.

11. Determine the appropriate Descriptive Words or Number for Point Scales of the
12. intended rubric.
13. Completed rubric sample: Video clip Assessment Rubric.
14. Consider the Applications of the Steam Rubric.

1. Identify and list down categories of tasks

Category	Task Description
The write up of the video	Plan and write a short write-up for your video-clip.
The development of the video	Use the notes to Make a 2-minute video clip to advertise and market your school to the public.
The content of the video	• The short video clip must embrace the school rules, motto, and mission and vision statements. • It must also contain messages of new and competent management. • This video clip has to have the potential to positively change the image of the school. • This 2-minute video clip must be captivating and totally convincing to attract students to want to enrol at your school.
The Presentation of the video	• This clip must not be more than 2 minutes (maximum time limit) • Present your video clip to be assessed.
The product	Submit both your write-up (on a chart) together with your video clip.

2. Unpack the Task Descriptions and Identify the essential KSAV that can be assessed

Category	Task Description	Essential KSAVs
The write up of the video script	Plan and write a short write-up for your video-clip.	Skill : Procedural Writing
The development of the video	Use the notes to Make a 2-minute video clip to advertise and market your school to the public.	Values and attitudes: • Teamwork and cooperation • Creativity Knowledge: Know about the school
The content of the video	The short video clip must embrace the school rules, motto, and mission and vision statements. It must also contain messages of new and competent management. This video clip has to have the potential to positively change the image of the school This 2-minute video clip must be captivating and totally convincing to attract students to want to enrol at your school.	Knowledge: Adequate content about the school Skill: convincing and persuasive Values and attitude: Encouraging and luring
The Presentation of the video	This clip must not be more than 2 minutes (maximum time limit) Present your video clip to be assessed	Skill: Time management delivery skills (posture, language) and communication skills social skills (relativity and connectivity) Values and attitude: confidence
The product	Submit both your write-up (on a chart) together with your video clip.	EKSAVs in the Write up and Presentation :

3. Reword the Task Descriptions with the inclusion of KSAVs into a Descriptor statement for each criteria and distribute into each Competency Level/Level of Achievement

4. Determine the appropriate Descriptive Words or Number for Point Scales of the intended rubric.

Criteria:	Advanced	Progressing	Novice	Mark
The write up of the video script	Skill: Procedural Writing Organised paper of video script writing procedures	Organised paper of video script writing procedures	Organised paper of video script writing procedures	/3
The development of the video	Values and attitudes: • Teamwork and cooperation • Creativity **Knowledge:** Know about the school The video corresponds to the 2-minutes script and illustrates teamwork	The video corresponds to the 2-minutes script and illustrates teamwork	The video corresponds to the 2-minutes script and illustrates teamwork	/ 3
Content of the video	**Knowledge:** Adequate content about the school Skill: convincing and persuasive Values and attitude: Encouraging and luring The short video clip embraces the core ideas of school rules, motto, and mission and vision statements.	The short video clip embraces the core ideas of school rules, motto, and mission and vision statements.	The short video clip embraces the core ideas of school rules, motto, and mission and vision statements.	/3

Presentation of the video	Skill: • Time management • delivery skills (posture, language) and • communication skills • social skills (relativity and connectivity) **Values and attitude:** confidence The video clip captures essence of vital messages of the new and competent management with potentials to positively change the image of the school and captivating and convincing to attract students to want to enrol at the school.	The video clip captures essence of vital messages of the new and competent management with potentials to positively change the image of the school and captivating and convincing to attract students to want to enrol at the school.	The video clip captures essence of vital messages of the new and competent management with potentials to positively change the image of the school and captivating and convincing to attract students to want to enrol at the school.	/3
The product	**EKSAVs** in the Write up and Presentation: Video clip submitted at the assessment deadline for presentations	Video clip submitted at the assessment deadline for presentations	Video clip submitted at the assessment deadline for presentations	/3

Completed rubric sample: Video clip Assessment Rubric

Criteria	Achieved	Progressing	Novice	Marks
Video Script Write up	Innovative and well organised paper with clarity of video script writing procedures	Well organised paper with clarity of video script writing procedures	Organised paper with some clarity of video script writing procedures	/3
Video Development	**Appropriately considered details** for the video are **well** corresponded to the 2-minutes script and illustrates a well-coordinated teamwork	**Considered details** for the video are **mostly** corresponded to the 2-minutes script and illustrates a coordinated teamwork	**Some details** considered for the video are **partially** corresponded to the 2-minutes script and illustrates a less coordinated teamwork	/3
Video Clip Content	• The short video clip **fully** embraces the core ideas of school rules, motto, and mission and vision statements.	• The short video clip **mostly** embraces the core ideas of school rules, motto, and mission and vision statements.	• The short video clip **somewhat** embraces the core ideas of school rules, motto, and mission and vision statements.	/3

Video Presentation	• The video clip **fully** captures essence of vital messages of the new and competent management with **necessary** potentials to positively change the image of the school and **really** captivating and **totally** convincing to attract students to want to enrol at the school.	• The video clip **mostly** captures the essence of vital messages of the new and competent management with **most** potentials to positively change the image of the school and **mostly** captivating and **partially** convincing to attract students to want to enrol at the school.	• The video clip **somewhat** captures the essence of vital messages of the new and competent management with **some** potentials to positively change the image of the school and **almost** captivating and **less** convincing to attract students to want to enrol at the school.	/3
Video Clip Submission Time	• Video clip submitted **well before** the assessment deadline for presentations	• Video clip submitted **just before** the assessment deadline for presentations	• Video clip submitted **within** the assessment time for presentations	/3

1. How to Score using the rubric

Scoring Rubrics

Criteria	**Achieved** **3**	**Progressing** **2**	**Novice** **1**	**Scoring**
Video Script Write up	**Innovative** and **well** organised paper with **clarity** of video script writing procedures	**Well** organised paper with **clarity** of video script writing procedures	Organised paper with some **clarity** of video script writing procedures	2/3
Video Development	**Appropriately considered details** for the video are **well** corresponded to the 2-minutes script and illustrates a well-coordinated teamwork	**Considered details** for the video are **mostly** corresponded to the 2-minutes script and illustrates a coordinated teamwork	**Some details** considered for the video are **partially** corresponded to the 2-minutes script and illustrates a less coordinated teamwork	1/3
Video Clip Content	• The short video clip **fully** embraces the core ideas of school rules, motto, and mission and vision statements.	• The short video clip **mostly** embraces the core ideas of school rules, motto, and mission and vision statements.	• The short video clip **somewhat** embraces the core ideas of school rules, motto, and mission and vision statements.	3/3

Video Presentation	• The video clip **fully** captures essence of vital messages of the new and competent management with **necessary** potentials to positively change the image of the school and **really** captivating and **totally** convincing to attract students to want to enrol at the school.	• The video clip **mostly** captures the essence of vital messages of the new and competent management with **most** potentials to positively change the image of the school and **mostly** captivating and **partially** convincing to attract students to want to enrol at the school.	• The video clip **somewhat** captures the essence of vital messages of the new and competent management with **some** potentials to positively change the image of the school and **almost** captivating and **less** convincing to attract students to want to enrol at the school.	3/3
Video Clip Submission Time	• Video clip submitted **well before** the assessment deadline for presentations	• Video clip submitted **just before** the assessment deadline for presentations	• Video clip submitted **within** the assessment time for presentations	2/3
11/15				

2. How to <u>Grade</u> using the rubric

Grading Rubrics

Score Range	**Grade**	**Qualifier (Proficiency)**	**Descriptor**	**Percentage**
13 – 15	**A**	**Advanced**	Description reflecting **<u>highest</u>** level of performance.	**76 - 100%**
9 - 12	**B**	**Achieved**	Description reflecting **<u>mastery</u>** level of performance.	**46 - 75%**
5 – 8	**C**	**Progressing**	Description reflecting **<u>movement towards</u>** mastery level of performance.	**26 - 45%**
0 - 4	**D**	**Novice**	Description reflecting **<u>beginning</u>** level of performance.	**0 - 25%**

3. How to Report using the rubric

a) Reporting an individual student's performance on the task

Assessment Task Report					
Assessment Task:		Video Development Project			
Name:	Grade:		Class:	Score and Grade:	/15
Criteria	**Achieved** **A**	**Progressing** **B**		**Novice** **C**	
Video Script Write up	**Innovative** and **well** organised paper with **clarity** of video script writing procedures	**Well** organised paper with **clarity** of video script writing procedures		Organised paper with some **clarity** of video script writing procedures	
Video Development	**Appropriately considered details** for the video are **well** corresponded to the 2-minutes script and illustrates a well-coordinated teamwork	**Considered details** for the video are **mostly** corresponded to the 2-minutes script and illustrates a coordinated teamwork		**Some details** considered for the video are **partially** corresponded to the 2-minutes script and illustrates a less coordinated teamwork	
Video Clip Content	• The short video clip **fully** embraces the core ideas of school rules, motto, and mission and vision statements.	• The short video clip **mostly** embraces the core ideas of school rules, motto, and mission and vision statements.		• The short video clip **somewhat** embraces the core ideas of school rules, motto, and mission and vision statements.	

Video Presentation	• The video clip **fully** captures essence of vital messages of the new and competent management with **necessary** potentials to positively change the image of the school and **really** captivating and **totally** convincing to attract students to want to enrol at the school.	• The video clip **mostly** captures the essence of vital messages of the new and competent management with **most** potentials to positively change the image of the school and **mostly** captivating and **partially** convincing to attract students to want to enrol at the school.	• The video clip **somewhat** captures the essence of vital messages of the new and competent management with **some** potentials to positively change the image of the school and **almost** captivating and **less** convincing to attract students to want to enrol at the school.
Video Clip Submission Time	• Video clip submitted **well before** the assessment deadline for presentations	• Video clip submitted **just before** the assessment deadline for presentations	• Video clip submitted **within** the assessment time for presentations

Note: The shaded is the student's proficiency score for each task.

Related links to this Business Studies Benchmark in Business Studies with other subject areas:

Subjects	Reference Benchmark Codes
1. Arts (Theatre Arts)	9.2.2.2
2. Christian Civic Value Education (CCVE)	9.3.1.3
3. Character Social Development (CSD)	9.1.5.1, 9.1.5.2, 9.1.5.3, 9.1.5.4, 9.1.5.5
4. English	9.2.2.1
5. Social Science (History)	9.2.2.3, 9.2.2.4
6. Social Science (Political Science)	9.3.3.1, 9.3.3.2
7. Technology Industrial Arts (TIA)	9.4.1.4, 9.4.1.5, 9.4.1.6

The anchor subject in this sample STEAM assessment is Technology and Industrial Arts .

Sample Assessment

Performance Assessment

STRAND 1: TEXTILE TECHNOLOGY

UNIT 2: TEXTILE AND CLOTHING

Content Standard 1.2: students will be able to integrate and apply principles and techniques in presenting fashion ideas and illustrations in pattern making and garment construction for a variety of needs and occasions.

Benchmark 11.1.2.1: Evaluate the historical influences, technological progression and emerging trends as inspirational sources for design.

Learning objectives:

1. List historical sources of design
2. Identify the changes to historical designs by technology
3. Create an item incorporating historical designs and technological progressions

Topic 1: Historical influences and technological progression

Purpose of Assessing the Topic:

To assess whether students can be able to identify and list historical sources of designs and the changes incorporated through/by technology and create an item capturing both sources of influence.

How the Performance Task will be done:

In pairs or small groups (can be regional/provincial or village grps), may create garment (clothing) or a household item.

Performance Standard: By the end of this project, students will be able to create a textile item originating from a historical design including features of modern technology.

Authentic situation

A literacy group of mothers from the community are having basic sewing lessons and experimenting on local or historical sources of designs that influence a lot of textile items today including traditional dyes and printing substances using traditional materials from the surrounding environment. The main aim of their literacy lessons or sessions is to promote traditional or historical skills, knowledge and designs using both local and modern materials and techniques.

They have invited the Home Economics department to help them create authentic textile items using their knowledge with the technological progressions and current trend of fashion. The item must be from a historical source of design that is of current trend with the influence of modern technology integrating modern and traditional materials.

The item must be created to make awareness and promote traditional or historical designs and materials and must also be marketable. The item must be attractive, authentic, aesthetic.

Task Description

Creating a product to meet a Design Brief

Sample Design Brief:

Context

A literacy group of mothers from the community are having basic sewing lessons and experimenting on local or historical sources of designs that influence a lot of textile items today including traditional dyes and printing substances using traditional materials from the surrounding environment.

They have invited the Home Economics department to help them create authentic textile items from a historical source of design that is of current trend with the influence of modern technology integrating modern and traditional materials.

Problem

A lot of Papua New Guineans are copying and favoring Western or modern clothing and accessories and our cultural or traditional (historical) designs or materials are gradually dying out. People need to be reminded of their origins by wearing or using textile items of historical designs integrating technological progressions.

Design Brief

Create an authentic textile item from a historical source of design that is of current trend with the influence of modern technology integrating modern and traditional materials, that must be marketable.

Specification

- The product must be appealing to the consumer
- The product must be comfortable and hang well to wear or carry
- The product must be strong and durable
- Cost: less than K50
- Timeline: 1 term

Investigation

- Study the styles of local, contemporary products or items that are made by local designers
- Research the current fashion styles and trends and the type of materials (natural fibres or modern fabric) and other materials to use.
- Decide on what you wish to use
- Investigate the patterns available for the product you wish to do (patterns optional)

- Take measurements (if necessary) and decide on how much materials you will need.

Drawing

Use A4 papers and make multiple drawings or sketches of different designs and choose the one that you like better and draw it properly again. Label the key features of your chosen design.

Making

- Make or obtain patterns if needed and pin to fabric and cut out (optional)
- Obtain materials from the surrounding for those using local/natural materials
- Remove pattern from fabric and make item (shirt/laplap/trousers, etc.)
- Weave, crotchet, twist, beat, knit natural fibres into desired item
- Complete the item using appropriate techniques and finishes.

Evaluation

- Consider these questions and write an honest comment about your product.
- Does it suit the purpose for which it was made?
- Is it constructed strongly?
- Is it comfortable to wear or appropriate to use?
- Is it suitable for the targeted consumer you had in your plan?
- Was it made within the cost limit?
- How could you have made it better?
- Is it marketable?

Materials:

* Fabric (woven, knitted, crocheted, non-woven)
* natural fibres -animal or plant fibres like tapa bark stripped to strings or other bush strings
* fabric paint and dyes, stencil, water
* shells, beads, plant seeds etc. for decorations
* papers, pencils, eraser for sketching, scissors
* sewing machine, needle, pins, thread, crotchet hooks, strings, wools

1. Developing Rubrics to Assess Textile item

» Decide on type of rubrics to be used (holistic/analytic)

» Plan rubrics

» Planning to develop rubrics

» Categorize the task description into criteria's

Sample of categorizing task for the rubric

- Plan a textile product they will create (*planning of project*)
- Research styles and designs of various traditional, contemporary and modern textile items. (*investigating/researching*)
- Draw multiple sketches of designs and choose one (*drawing or sketching designs*)
- Decide on one and collect materials required for the project. (*collecting of required materials*)
- Construction of the textile item (*construction process and techniques*)
- Product must be authentic, aesthetic, attractive, strong and marketable (*finished product*)
- Presentation of the product to the group of mothers (*oral and visual presentation*

2. Identify and list down categories of tasks

Category	**Task Description**
Planning of project	Plan a textile product they will create
Investigating/researching	Research styles and designs of various traditional, contemporary and modern textile items
Drawing or sketching designs	Draw multiple sketches of designs and choose one
Collecting of required materials	Decide on one and collect materials required for the project
Construction process and techniques	Construction of the textile item
Finished product	Product must be authentic, aesthetic, attractive, strong and marketable
Oral and visual presentation	Presentation of the product to the group of mothers

3.**Identify the essential KSAV that can be assessed**

Category	**Task Description**	**Essential KSAV**
Planning of project	Plan a textile product they will create	**Skill**: critical thinking **Knowledge**: know traditional & modern designs
Investigating/researching	Research styles and designs of various traditional, contemporary and modern textile items	**Skill:** research & investigate **Values & attitudes**: respecting each other teamwork & cooperation **knowledge**: understand styles, designs

Drawing or sketching designs	Draw multiple sketches of designs and choose one	**Skills**: drawing or sketching **Value**: value different designs **Attitude**: respect other views/ ideas
Collecting of required materials	Decide on one and collect materials required for the project	Knowledge: know traditional/historical designs, material & patterns Values & Attitude: - value & appreciate traditional designs, materials
Construction process and techniques	Construction of the textile item - sewing - weaving - printing, dyeing - knitting, crocheting using appropriate methods, techniques and tools in the construction process.	Skills : construction process & techniques Values & Attitude: - Respecting & Appreciating designs & materials - Accepting & Valuing changes
Finished product	Product must be authentic, aesthetic, attractive, strong and marketable	Skills: finishes to the product (printing, dyeing etc.) Value & Attitude: - Appreciating & valuing the new product
Oral and visual presentation	Presentation of the product to the group of mothers	Skills: - time management - delivery skills - communication skills knowledge: - adequate content on historical sources of design & technological influence values and Attitude: confidence - good self esteem
Product submission time	Submitting the product and doing oral presentation	EKSAVs in the product and presentation

Design the rubrics

i. Design a holistic rubric

ii. Decide what to assess from the category

iii. Decide what point scale to use (always use 3 or 5 point scale)

iv. Decide whether you will score the criteria.

Rubric Sample

Criteria	Achieved	Progressing	Novice	Marks
Planning of project	**Well** planned and organized with task **delegated fairly** to group members	planned and organized **properly** but **unfair task delegation**	**Planned properly** but **poor organization** and task delegation	/3
Investigating/ researching	**Well** researched and identified **all** different styles, designs, patterns of historical and modern textile items	**Partially** researched and identified **some** styles, designs, patterns of historical and modern textile items	**A little** researching and **a few** styles, designs, patterns of historical and modern textile items	/3
Drawing or sketching designs	**Creatively** drew **4 drawings** with **a variety** traditional and modern designs, styles etc.	**Well-drawn 2-3 drawings** with **some** traditional and modern designs, styles etc.	**Sketches** of **1-2 drawings** with **a few** traditional and modern designs, styles etc.	/3
Collecting of required materials	Collected **all** required materials for project	Collected **some** materials for the project	Collected **only a few** materials for the project	/3
Construction process and techniques	**Creative** and **innovative,** using **appropriate** techniques and tools.	**Well -constructed** using **some appropriate** techniques and tools	Constructed evident using **inappropriate** techniques and tools	/3
Finished product	Product is **authentic, aesthetic, marketable** and **meets** the design brief.	Product is **constructed well** but **partially meets** the design brief.	Product **poorly constructed** and **doesn't meet** the design brief.	/3
Oral and visual presentation	**Confidently** presented within **time frame, convincing** audience of aim of product (promoting historical designs)	**Partially confident** and **overlapped time frame** and **partially** convincing of aim of product.	**Lacked confident** and **poor time** management and **was not convincing.**	/3
Product submission time	Submitted product and oral presentation **well before** deadline.	Submitted product and presentation **just before** assessment deadline for presentation.	Submitted product and presentation **within** time for presentation.	/3

Note: Your Assessment Plan must include the National Department of Education Observable events, Commemorated events and Official Public Holidays or any calendar dates that may disrupt schooling, to help you plan your termly assessment plans.

GLOSSARY

Words	Definitions
Porous Fibres	Porous fiber consists of three-dimensional components using polymeric fibers that are bonded together where they touch. This creates a void in between the fibers to hold fluid, making them porous.
Acid wash	-of, relating to, or being a fabric or a garment that has been treated with a bleach solution to produce a streaked or discolored appearance.
Air jet- finish	Air-jet spinning is also known as **Vortex or fascinated yarn spinning**.
Anti –shrinkage treatment	The finishing process by which the cotton knitted fabrics are made not to shrink is known as «Anti-Shrink Treatment». Different type of knitted fabrics such as single jersey, interlock and flat back rib were treated with Resil CLS using pad-dry-cure technique.
Anti-microbial	A substance that kills microorganisms such as bacteria or mold, or stops them from growing and causing disease.
Anti-pill finish	The resistance of fabric to form little balls on the surface due to abrasion during wear. This could be a natural feature of the fabric or due to application of a special finish to prevent pilling.
Apparel	Clothing- that are worn
Appliqued quilt	A needlework technique in which one or more pieces of fabric are attached to a larger background fabric to create pictures or patterns. The fabric can be attached by hand, machine or fused.
artisan	-a worker who practices a trade or handicraft :handicraft: craftsperson. a skilled artisan. : - People who manufacture handicraft goods are known as artisans. People who manufacture handicraft goods are known as craftspeople or artisans. Handicraft is the activity of making decorative or other objects by hand.

Bead board	bead·board ˈbēd-ˌbȯrd. : paneling that features decorative beading (see beading sense 1a) and that is used typically on walls (as for wainscoting) and ceilings. The porch has a beadboard ceiling, paddle fan and recessed lighting, creating a comfortable retreat.
Bead reamer	A bead reamer is a pointed, round needle file that is used to either smooth the edges of the drill-hole in a bead, or to enlarge or straighten the hole itself.
Bead spinner	A bead spinner is a tool that makes bead working faster and more efficient. It normally consists of two main parts: a base (the stand) and an upper chamber (the bowl) which spins. It also includes a needle with a slight curve to the tip. This helps draw up the beads and ensures they flow onto the thread
Beading Loom	A bead loom is a tool used to weave beads together.
Beetling	Beetling is a process applied to linen fabrics and to cotton fabrics made to resemble linen.
belt	a strip of leather or other material worn, typically round the waist, to support or hold in clothes or to carry weapons.
Bleaching	cause (a material such as cloth, paper, or hair) to become white or much lighter by a chemical process or by exposure to sunlight.
Brushing	Brushing is a finishing process used to raise the surface fibres of a fabric. The fabric undergoes a mechanical brushing process in which fine, metal brushes carefully rub the fabric to produce fine fibres from the woven yarns, creating extra softness on the surface of the fabric.
Business opportunities	Textile manufacturing is a huge industry that entails the conversion of fiber into yarn, and that yarn into fabric. These fabrics are dyed, printed, or fabricated into clothes and various other items. Different types of fibers are used to produce yarn, with cotton remaining the most important natural fiber.
Calendaring	Mechanical finishing process in which fabric is passed between two rollers (one metal and one cotton fabric) under heavy pressure to create a variety of flattened looks and textures. Examples include chaised, moiré, and friction.

Characteristics of fibres and fabrics	-Textile fibers are perhaps most obviously characterized by their fineness; they are long and very thin. - Durability, abrasion resistance, and UV light resistance is generally very good. A non-absorbent fibre, it will move very little in humid conditions. Not affected by acidic pollution or mildew. A strong and stable fibre.
chemical	Definition of Textile chemicals. The processes of conversion of natural and manmade textile fibres according to end uses & attractive qualities as per need of customer where involving the uses of a large number of organic and inorganic chemicals known as textile chemicals
Chemical finish	Chemical finishing can be defined as the use of chemicals to achieve a desired fabric property. Chemical finishing, also referred to as 'wet' finishing,
Clothing	Clothing (also known as clothes, garments, dress, apparel, or attire) is any item worn on the body. Typically, clothing is made of fabrics or textiles, but over time it has included garments made from animal skin and other thin sheets of materials and natural products found in the environment, put together.
Coloring	Dyeing can be described as the uniform application of colorant(s) to a coloring medium. The coloring of textiles may involve mass pigmenting (involving compounding), dyeing, and printing processes.
Combination tools	**Combination tools** (Spanner). It is usually made of forged steel. The size of spanners denotes the size of the bolt on which it can work.
Composite garments	-Composite fabrics are fabrics that include several structural elements that are combined into a single structure -Textile composite materials consist of a polymer matrix (thermoplastic or thermoset) combined with textile reinforcement. Materials of interest to the group include commingled glass/polypropylene fabrics.
construction	-Fabric construction is defined as the warp and weft yarn density in a fabric sheet. -the process, art, or manner of constructing. 3. :3.: something built or put together :together: structure.

Construction process	Fabric construction involves the conversion of yarns, and sometimes fibres, into a fabric having characteristics determined by the materials and methods employed. Most fabrics are presently produced by some method of interlacing, such as weaving or knitting.
Cotton	-soft white fibrous substance which surrounds the seeds of the cotton plant and is made into textile fibre and thread for sewing. - Cotton fabric is one of the most commonly used types of fabrics in the world. This **textile is chemically organic**,
Cutting tools	There are many different types of cutting tools that can be used for sewing. These include scissors, rotary cutters, pinking shears, thread snips, seam rippers, and more. Each type has its own unique purpose which is crucial to your project's success.
Darn a socks	To darn a sock **is to repair a hole in it using needle and thread**.
De-clutter	Steps to help you declutter your sewing room. Getting rid of some of the stash is hard, but it makes for a more organised space.
Denim	Denim is **a strong cotton fabric made using a twill weave**, which creates a subtle diagonal ribbing pattern Denim is a sturdy cotton twill fabric woven with an indigo, gray, or mottled white yarn. Denim is perhaps one of the most well-known and commonly worn fabrics there is, from the classic blue jeans to jackets, dresses, overalls, and more.
Design	**The process of planning and producing a fabric's appearance and structure**. Textile designers dream up designs that are woven - Textile designing is a field that includes fashion design, carpet manufacturing and any other cloth-related field
Design process	- Textile design is the process of creating patterns or designs onto fabrics by way of weaving, knitting, or printing. - Textile design is the process of creating knitted, printed, and woven textiles.

Design sources	Textile design is the process of planning and producing a fabric's appearance and structure. Textile designers dream up designs that are woven or knitted into cloth or printed on fabric.
diffusion	Diffusion is the process by which the colorant molecules penetrate the interior of the fibres. The scientific study of diffusion is a compara- tively recent activity, and almost all work has been car- ried out with synthetic dyes.
Dispositions of chemicals	hazardous **chemicals** have been detected in a wide range of **textiles** and clothing prod- ucts. A large number of complex **chemical** ingredients are used to produce various textile products
Draping	The process of positioning and pinning the fabric on a dress form is called draping. Draping can be used to create the basic pattern or to design organically by playing with the fabric on the form
durability	It is the ability of a material to exist for a long time without significant deterioration and, especially for fabrics, to resist wear through continual use and care.
Elements of design	-The four basic ingredients or elements of design used in fashion are shape or silhouette, line, colour and texture. - The elements of design are the fundamental aspects of any visual design which include shape, color, space, form, line, value, and texture
Fabric fastening	-In textile design, fastenings are the objects used to hold a garment together. While they can be permanent, they are generally built to fasten and unfasten the textile numerous times. -Fasteners are used to hold two pieces of a garment together some pieces lap one over the other, while others meet. Fasteners include snaps, hooks and eyes, self-gripping devices, buttons and buttonholes, and zippers.
Fabric porosity	**The total volume of void space within a specified area of the fabric.**[11] Apart from the fabric structure, hairy fibre and fabrics

Fabrics	A cloth that has been woven, knitted, tufted, knotted, or bonded together using natural or synthetic threads, yarns,
fashion	Generally, fashion refers to the change in style of garment.
Fashion design	-Textile and Apparel Design, commonly referred to as Fashion Design, relates the physical properties of textiles to our human need for functional and fashionable clothing and home accessories. Fashion and textile design is about creating a cohesive and finished appearance that can convey sophistication, be it through clothing or interior design.
Fashion ideas	**-Clothing describes the material and the technical garment**, devoid of any social meaning or connections; costume has come to mean fancy dress or masquerade wear -Fashion is a form of self-expression and autonomy at a particular period and place and in a specific context, of clothing, footwear, lifestyle, accessories, makeup, hairstyle, and body posture.
Fiber-based artwork	Fiber art refers to fine art whose material consists of natural or synthetic fiber and other components, such as fabric or yarn. It focuses on the materials
Fibres	Textile fibres are natural or synthetic structures that can be spun into yarn and woven, knitted, or bonded into fabric.
Flex textile	Flex Textile is a thermo-adhesive material that is used for printing on fabrics for the most varied uses, especially in fashion. Flex has the ability to merge with the most varied types of fabric, from cotton to nylon and polyurethane.
Folding	Fabric folding is the process of winding fabrics into clean, stretch-free folded form for easy packaging and transportation. It is the stage of fabric inspection that follows the defect mapping and cutting process.
Folding and cutting	all fabrics/materials are **cut and folded** similar to how you would fold a blanket. We do leave one edge free to make it easy to piece out smaller.

Functional clothes	Functional clothing by definition is user-requirement specific and designed or engineered to meet the performance requirements of the user under extreme conditions.
Functions of tools	Textile tools have a number of different tools, such as loom sword, loom weights, wool comb / flax hackle, whorls, needles made of bone or metal, needle cases, seam smoothers and scissors. -textiles have an assortment of uses, the most common of which are for clothing and for containers such as bags and baskets. In the household, textiles are used in carpeting, upholstered furnishings, window shades, towels, coverings for tables, beds, and other flat surfaces, and in art.
Garment	A garment is a piece of cloth made of textile material(s) and it is stitched by means of a sewing machine. 'Garment' is the most common term used to name our clothes.
Hair	-The principal hair fiber used to produce textile fabrics is **sheep's wool**. In wild sheep, the wool is a short, soft under layer protected - Haircloth is a stiff, unsupple fabric typically made from horsehair and/or from the wooly hair of a camel.
Hems	Hems lie at the end of a piece of cloth, where the fabric has been folded and sewn into place to prevent the material from fraying or loosing its shape. The process of hemming uses small, nearly invisible stitches to catch the fabric and hold it securely in place
Innovation	Innovation in fiber and textiles affects everything from **packaging to wearable electronics** to aerospace materials to the clothes we wear.

Innovative approach	The idea is to come up with different textiles with an eye on creativity and design to create and recreate different articles of clothing People have been creating clothing for thousands of years, but it was not until the Industrial Revolution that the textile industry radically changed. The invention of the power loom in 1785 sharply increased the efficiency of garment production.18 Sept
Manufactured fibres	-The fibers that belong to this category are **either entirely produced from chemical or is a combination of chemical processing and raw material** - Synthetic fibers or synthetic fibres are fibers made by humans through chemical synthesis, as opposed to natural fibers that are directly derived from living organisms, such as plants or fur from animals
Mechanical furnishing process	-Commonly used mechanical finishes include **calendaring, compressive shrinkage / Sanforizing, raising, emerizing / sueding / peaching, shearing** / -Mechanical finishing is a big and important industry, it encompasses many processes that alter the surface of a manufactured item to achieve a certain property: improve appearance, adhesion or wettability, solderability, corrosion resistance, tarnish resistance, chemical resistance, wear resistance, hardness, modify. ..
Medieval clothing	-Various fabrics, such as taffeta, velvet, and damask were **made from textiles like silk, cotton, and linen using specific weaving techniques**. - Peasant men wore stockings or tunics, while women wore long gowns with sleeveless tunics and wimples to cover their hair. Sheepskin cloaks and woolen hats and mittens were worn in winter for protection from the cold and rain. Leather boots were covered with wooden patens to keep the feet dry.
Metal wire tools	Wire cloth is a **woven (or nonwoven) sheet or web material with a** series of openings across the surface. Wire cloth is also known as: Metal Fabric or Metal Cloth.
Methods of water repellent	There are two main methods of water-repellent treatmen such as hydrophobic admixture method and surface treatment method [29,30,31]. Many studies have shown that hydrophobisation has a positive effect on improving material properties.

Natural fabric	Is woven or knitted from fibres that occur in our natural world. All three sectors of nature; animal, vegetable and mineral produce fibres that can be used in fabric production.
Natural polymer	Materials that widely occur in nature or are extracted from plants or animals. Natural polymers are essential to daily life as our human forms are based on them.
Outputs	The fabric that is manufactured by the factory is the out put.
overhauling	Visible mending is the practice of **repairing** clothes and other **textile** based objects in a way that is clearly visible, rather than trying to hide the **repair**.
Panels of fabric	In fabric, a panel is a large piece of cloth that's been cut into smaller pieces to create a finished product. Panels can be used in different ways to add depth and interest to an item, or they can serve as the main structural element of a garment.
Paper piercing quilt	Paper Piecing, refers to sewing fabrics to a paper foundation to stabilize the quilt block due to unusual geometric shapes, small pieces or odd angles on a bias.
Patch holes	If you patch something that has a hole in it, you mend it by fastening a patch over the hole.
Personal safety	Personal protective equipment means any device or appliance to be worn or held by an individual for protection against one or more health and safety ...
Pierced quilt	**The act of assembling and stitching pieces of fabric together, by hand or machine, to make a quilt block**.
Pliers	See **Fabric** Edge Match **Pliers** to pull and match up your top layer with your bottom layer when sewing complicated curved and contoured shapes.
Polyester	**A synthetic fabric that's usually derived from petroleum**. This fabric is one of the world's most popular textiles, and it is used in thousands A manufactured synthetic fiber. It is a kind of plastic and is usually derived from petroleum.
Pressing	Pressing is a method of using your iron to ensure a seam is flat and is an important part of quilt making.

Principles of design	The principles of design consist of: balance, proportion (also referred to as scale), emphasis, and rhythm. -The principles of design describe the ways that artists use the elements of art in a work of art. Balance is the distribution of the visual weight of objects, colors, texture, and space. If the design was a scale, these elements should be balanced to make a design feel stable.
Process of a silk	This process, silkworm larvae are fed with mulberry leaves, and after the fourth moult, they climb a twig placed near them and spin their silken cocoons. Then the cocoon is treated with boiling water and then silk is unwound from the cocoon delicately. Around 10 kg of cocoon produces 1 kg of silk.
Productivity	Productivity, in simple words, is the relationship between output and input. The output in garment factories can be pieces of finished garments.
Productivity	In garment factory productivity is expressed in terms of number of garments produced per sewing machine per shift or per operator per shift. Productivity, in simple words, is the relationship between output and input.
Properties of fibres acid	All natural fibres are hygroscopic, which also makes them stronger when they are wet. - Thermal property: It is the heat resistance of fibre, conductivity and melting point on which the fibre melts. - Chemical property: It is the effect of acids, alkalis, bleaches and normal laundering reagents on the fibre
Properties of textiles	Fibre length, strength, cohesiveness and flexibility are the four essential textile fibres properties. 1. Fibre Length: This is the most important property, along with its strength. Most natural textile fibres exist as staple fibres and their length varies considerably.
quilt	~~A quilt is~~ a multi-layered textile, traditionally composed of two or more layers of fabric or fiber. Commonly three layers are used with a filler material. These layers traditionally include a woven cloth top, a layer of batting or wadding, and a woven back combined using the techniques of quilting.

Raising	~~Raising is~~ the technique whereby a surface effect is produced on the fabric that gives the fabric a brushed or napped appearance. It is achieved by teasing out the individual fibers from the yarns so that they stand proud of the surface
Rayon	- a textile fibre or fabric made from regenerated cellulose (viscose). "clothing made of rayon" -Rayon is a fiber from regenerated cellulose, generally derived from wood pulp. Rayon is usually made from eucalyptus trees,
Rayon	a yarn, thread, or fabric made from fibers produced chemically from cellulose. -Rayon is produced by dissolving cellulose, then converting this solution back to insoluble fibrous cellulose. -Various processes have been developed for this regeneration. -The most common methods for creating rayon are the cuprammonium method, the viscose method, and the lyocell process.
Reeling	Reeling is the process of unwinding raw silk filament from the cocoon directly onto a holder. When several filament strands, either raw silk or synthetic, are combined and twisted together, producing yarn of a specified thickness, the process is called throwing.
Refractory and related fibres-fibers(RCFs)	~~Refractory ceramic fibres~~ (RCFs) are amorphous man-made fibres produced from the melting of calcined kaolin clay or a combination of alumina and silica.
Repair	Repairs can include **replacing broken or lost components such as zippers, buttons or rivets** or the repairing of rips and snags in the fabric itself. Mending is the act of repairing clothes with imperfections from being well-worn.
Repair techniques	There are two common types of mending: visible mending and invisible mending. Invisible mending is a repair technique that is used when you don't want the mended area to stand out – the less obvious, the better. The aim is for the garment to look as close to its original condition as possible.

Sash	A sash is a wide band of fabric that either secures clothing around your waist or decorates a uniform.
Scouring	"Scouring" is the textile term for cleaning fibers prior to mordanting and dyeing, and does not refer to washing fabrics in a washing machine. If the fiber is not clean, the mordant and dyes will not adhere well to the fiber. Fabrics sold as gray goods or "greige" require a thorough scour.
Scouring Process	Scouring is the process of washing the sheared hair. Wool scouring is the process of washing wool in hot water and detergent to remove the non-wool contaminants and then drying it. The woolen fibres are thoroughly washed in big tanks to remove grease, dust, and dirt by fully mechanized machines.
seams	**A method of binding two or more pieces of fabric together**, usually using thread to form stitches.
Sericulture	This is the term used to describe the process of gathering the silkworms and harvesting the cocoon to collect the materials.
Setting up maintenance	**Preventive maintenance is the systematic care and protection of tools, equipment, machines, and vehicles** in order to keep them in a safe -Equipment maintenance is any process used to keep a business's equipment in reliable working order. It may include routine upkeep as well as corrective repair work. Equipment may include mechanical assets, tools, heavy off-road vehicles, and computer systems.
Sewing kit	A sewing kit is a small package containing items, such as needles and thread, that you need to sew something. Needles and thread are included in the sewing kit.
Shawl	a piece of fabric or knitted or crocheted material worn around the shoulders by women or wrapped around a baby. - It is usually a rectangular or square piece of cloth, which is often folded to make a triangle, but can also be triangular in shape. Other shapes include oblong shawls.

Shearing	-~~Shearing is~~ **a kind of mechanical finish in which the appearance of the fabric is enhanced by cutting the loops or raised surface to a uniform and even height**. -The removal of the fleece of the sheep along with a thin layer of skin from its body is called shearing. - Shearing is the process of cutting sheet metal to size out of a larger roll or flat stock. As the material moves through the shear machine, cutting blades come together in order to fracture the material into separate, smaller pieces. This process creates quality clean cuts that can be repeated quickly.
Silk	~~Silk is~~ a very smooth, light fabric that's usually made of fibers from silkworm cocoons. - Silk is a natural fiber known for its luster, shine, strength, and durability, and it has a long trading history across the world
Silk	A fine continuous protein fiber produced by various insect larvae usually for cocoons. especially :especially: a lustrous tough elastic fiber produced by silkworms and used for textiles.
Silk production process	Extracting raw silk starts by cultivating the silkworms on mulberry leaves. Once the worms start pupating in their cocoons, these are dissolved in boiling water in order for individual long fibres to be extracted and fed into the spinning reel.
Silk thread	Silk is a natural fiber known for its luster, shine, strength, and durability, and it has a long trading history across the world. Silk is the epitome of luxury due to its high cost to produce, soft feel, and elegant appearance, and it is thus a popular textile in high-end and couture fashion design.12 Aug 2021
Silk thread process	Extracting silk from the cocoon is known as the processing of silk. Silk is separated from the cocoon by exposing it to sunlight. After the reeling of silk is done, the process of unwinding silk from a cocoon takes place. Silk thread is then bleached. The silk fibre is then spun into silk threads.

Spinning wheel	-Spinning wheel, early machine for turning fibre into thread or yarn, which was then woven into cloth on a loom. The spinning wheel was probably invented in India, though its origins are obscure. It reached Europe via the Middle East in the European Middle Ages. -T he other name of the spinning wheel is Charkha. It is a small, portable and hand-cranked wheel. This device is used to draw thread or yarn from different fibres. - this particular device was used to make yarn from wool. Spinning wheels help to twist fibers together tightly as a person draws out the yarn with their fingers. Smaller spinning wheels with a foot pedal are also common and were used to spin flax into linen.
Synthetic polymer	Synthetic polymers are those which are human-made polymers. Polymers are those which consist of repeated structural units known as monomers.
Tailoring	~~Tailoring is the~~ art of designing, cutting, fitting, and finishing clothes. The word tailor comes from the French tailler, to cut, and appears in the English language during the fourteenth century
Technology	-Technology is the application of scientific knowledge to the practical aims of human life or, as it is sometimes phrased, to the change and manipulation of the human environment. - the application of scientific knowledge for practical purposes, especially in industry.
Telemarketing	Telemarketing refers to contacting, qualifying, and canvassing customers and prospective customers by telephone and other devices.
Textile	-Textile is an umbrella term that includes various fiber-based materials, including fibers, yarns, filaments, threads, different fabric types, etc -Textiles are made from fibres, classified as either natural or manufactured. Fibres are twisted into yarns before being made into woven, knitted or bonded fabrics.

Textile construction	Basically, a constructed textile is a textile made by processes that involve connecting threads to form a larger fabric. These processes often involve specific tools and techniques. You can make constructed textiles in many ways, and examples of them have been found dating to prehistoric times.
Textile designer	A textile designer is a person who manages the aesthetic aspect of textile production, including texture, color, and patterns. Basically, they're in charge of the designs printed, woven, knit, or sewn into textiles.
Textile technology	Textile technology deals with the fabrication, manipulation, and assembly of fiber-shaped (i.e., line-shaped) materials. Textile techniques can not only be used to weave cloths from cotton fibers but also to hold wounded tissues together with surgical sutures.
Textile Tools storage safety	Textile tools can be divided into categories depending on the stage of the chain of operation, in which they are used. This way we distinguish tools used in the processing of raw materials, in yarn and textile production, in textile dyes and finally in textile finishing.
Thread Extraction:	Once the silkworms have spun their cocoon, they will eventually enclose themselves inside it and then it's time to extract.
Threads	A thread is a long strand of material, often composed of several filaments or fibres, used for joining, creating or decorating textiles. Thread can be made of many different materials including cotton, wool, linen, nylon, and silk. Metal threads, sometimes used in decorative textiles, can be made of fine wire.
Tools storage safety	Safety and health in textiles, clothing, leather and footwear. Contents ... **Transport, storage and disposal of hazardous substances**.
Tools Storage safety	Safe Storage Of Equipment Treat your fabric shears with great respect and never cut anything than fabric or textile material with them. - Reduce the chance of an accident by following the below safety measures

Trade shows	Trade shows are often business-to-business (B2B) events attended by businesses in a specific market. Visitors are typically representatives of companies, distributors, resellers, suppliers, and media in the industry. Examples: Beauty, software, architecture and medical trade shows.6 Oct 2022
Trading and commodity	Commodity trading is where various commodities and their derivatives products are bought and sold. A commodity is any raw material or primary agricultural product that can be bought or sold, whether rawwhether raw cotton fibres , silk etc
Water repellent	Water repellency is a term related to the ability of a fabric to resist wetting. Here, due to the fabric pores and permeability to air and water vapor, protection against water is not complete under high hydrostatic pressure and the wearer will become wet in downpour when the hydrostatic pressure is high enough.
Water repulsive	Water repellency is, therefore, a step up from water resistance. This means that water can't easily penetrate the material (the technical term is that it's hydrophobic). Meaning: Not easily penetrated by water, especially as a result of being treated for such a purpose with a surface coating.
Wool	~~Wool is a~~ type of fabric derived from the hairs of various animals. To make wool, producers harvest the hairs of animals and spin them into yarn.
yarn	~~Yarn is~~ **a material made from staple fibre or continuous filaments used to** make fabrics, sweaters, scarfs, and sewing garments. - A textile yarn is a continuous strand of staple or filament fibers arranged in a form suitable for weaving, knitting, or other form of fabric assembly.
zipper	a device consisting of two flexible strips of metal or plastic with interlocking projections closed or opened by pulling a slide along them, used to fasten garments, bags, and other items. "zipper bags"

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APPENDICES

Appendices #: **BLOOM'S TAXONOMY**

LEVEL OF UNDERSTANDING	KEY VERBS
CREATING Can the student create a new product or point of view?	Construct, design, and develop, generate, hypothesize, invent, plan, produce, compose, create, make, perform, plan, produce, assemble, formulate,
EVALUATING Can the student justify a stand or decision?	Appraise, argue, assess, choose, conclude, critique, decide, defend, evaluate, judge, justify, predict, prioritize, provoke, rank, rate, select, support, monitor,
ANALYZING Can the student distinguish between the different parts?	Analysing, characterise, classify, compare, contrast, debate, criticise, deconstruct, deduce, differentiate, discriminate, distinguish, examine, organise, outline, relate, research, separate, experiment, question, test,
APPLYING Can the student use the information in a new way	Apply, change, choose, compute, dramatise, implement, interview, prepare, produce, role play, select, show, transfer, use, demonstrate, illustrate, interpret, operate, sketch, solve, write,
UNDERSTANDING Can the student comprehend ideas or concepts?	Classify, compare, exemplify, conclude, demonstrate, discuss, explain, identify, illustrate, interpret, paraphrase, predict, report, translate, describe, classify,
REMEMBERING Can the student recall or remember the information?	Define, describe, draw, find, identify, label, list, match, name, quote, recall, recite, tell, write, duplicate, memorise, recall, repeat, reproduce, state,

Appendices #: 21ST CENTURY SKILLS

WAYS OF THINKING	Creativity and innovation • Think creatively • Work creatively with others • Implement innovations Critical thinking, problem solving and decision making • Reason effectively and evaluate evidence • Solve problems • Articulate findings Learning to learn and meta-cognition • Self-motivation • Positive appreciation of learning • Adaptability and flexibility
WAYS OF WORKING	Communication • Competency in written and oral language • Open minded and preparedness to listen • Sensitivity to cultural differences Collaboration and teamwork • Interact effectively with others • Work effectively in diverse teams • Prioritise, plan and manage projects

TOOLS FOR WORKING	**Information literacy** • Access and evaluate information • Use and manage information • Apply technology effectively **ICT literacy** • Open to new ideas, information, tools and ways of thinking • Use ICT accurately, creatively, ethically and legally • Be aware of cultural and social differences • Apply technology appropriately and effectively
LIVING IN THE WORLD	**Citizenship – global and local** • Awareness and understanding of rights and responsibilities as a global citizen • Preparedness to participate in community activities • Respect the values and privacy of others **Personal and social responsibility** • Communicate constructively in different social situations • Understand different viewpoints and perspectives **Life and career** • Adapt to change • Manage goals and time • Be a self-directed learner • Interact effectively with others

Appendices #: TEACHING AND LEARNING STRATEGIES

STRATEGY	TEACHER	STUDENTS
CASE STUDY Used to extend students' understanding of real life issues	Provide students with case studies related to the topic of the lesson and allow them to analyse and evaluate.	Study the case study and identify the problem addressed. They analyse the problem and suggest solutions supported by conceptual justifications and make presentations. This enriches the students' existing knowledge of the topic.
DEBATE A method used to increase students' interest, involvement and participation	Provide the topic or question of debate on current issues affecting a bigger population, clearly outlining the expectations of the debate. Explain the steps involved in debating and set a criteria/ standard to be achieved.	Conduct researches to gather supporting evidence about the selected topic and summarizing the points. They are engaged in collaborative learning by delegating and sharing tasks to group members. When debating, they improve their communication skills.

Strand: .....

Unit: .....

Content Standard: .....

Benchmark: .....

Topic : .....

Lesson Topic: .....

Lesson Objective (s): By the end of the lesson, students will be able to;

.....
.....
.....

Essential Questions:

.....
.....
.....

Knowledge:

.....

.....

Skill(s):

.....

.....

Values:

.....

.....

Attitudes:

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.....

DISCUSSION The purpose of discussion is to educate students about the process of group thinking and collective decision.	The teacher opens a discussion on certain topic by asking essential questions. During the discussion, the teacher reinforces and emphasizes on important points from students' responses. Teacher guide the direction to motivate students to explore the topic in greater depth and the topic in more detail. Use how and why follow-up questions to guide the discussion toward the objective of helping students understand the subject and summarise main ideas.	Students ponder over the question and answer by providing ideas, experiences and examples. Students participate in the discussion by exchanging ideas with others.
GAMES AND SIMULATIONS **Encourages motivation and creates a spirit of competition and challenge to enhance learning**	Being creative and select appropriate games for the topic of the lesson. Give clear instructions and guidelines. The game selected must be fun and build a competitive spirit to score more than their peers to win small prices.	Go into groups and organize. Follow the instructions and play to win

OBSERVATION Method used to allow students to work independently to discover why and how things happen as the way they are. It builds curiosity.	Give instructions and monitor every activity students do	Students possess instinct of curiosity and are curious to see the things for themselves and particularly those things which exist around them. A thing observed and a fact discovered by the child for himself becomes a part of mental life of the child. It is certainly more valuable to him than the same fact or facts learnt from the teacher or a book. Students • Observe and ask essential questions • Record • Interpret
PEER TEACHING & LEARNING ***(power point presentations, pair learning)*** Students teach each other using different ways to learn from each other. It encourages; team work, develops confidence, feel free to ask questions, improves communication skills and most importantly develop the spirit of inquiry.	Distribute topics to groups to research and teach others in the classroom. Go through the basics of how to present their peer teaching.	Go into their established working groups. Develop a plan for the topic. Each group member is allocated a task to work on. Research and collect information about the topic allocated to the group. Outline the important points from the research and present their findings in class.

PERFOR-MANCE-RELATED TASKS ***(dramatization, song/lyrics, wall magazines)*** Encourages creativ-ity and take on the overarching ideas of the topic and are able to recall them at a later date	Students are given the opportunity to perform the using the main ideas of a topic. Provide the guidelines, expectations and the set criteria.	Go into their established working groups. Being creative and create dra-mas, songs/lyrics or wall maga-zines in line with the topic.
PROJECT **(individual/group)** **Helps students complete tasks in-dividually or collec-tively**	Teacher outline the steps and procedures of how to do and the criteria.	Students are involved in investi-gations and finding solutions to problems to real life experiences. They carry out researches to analyses the causes and effects of problems to provide achiev-able solutions. Students carefully utilize the problem-solving ap-proach to complete projects.
USE MEDIA & TECHNOLOGY to teach and generate engagement <u>de-pending on the age of the students</u>	Show a full movie, an animated one, a few episodes' form documen-taries, you tube movies and others depending on the lesson. Provide questions for stu-dents to answer before viewing	Viewing can provoke questions, debates, critical thinking, emotion and reaction. After viewing, students engage in critical thinking and debate

Appendices #: ***Samples of Student Response System Applications***

These are web based apps that work with a multitude of devices and operating systems. Here are the 4 best student response systems that interface with multiple devices.

1. Kahoot

Kahoot is a utility that allows teachers to create quizzes and surveys, and then send them to students. Teachers may allow students an unlimited amount of time to

respond to questions, or they may set a time limit on each question. Points are awarded to students both for correct answers and for responding quickly with those correct responses. Teachers can track students as they make progress.

2. Socrative

Socrative works excellently both for students working on their own or for students who are collaborating with one another. Socrative offers several different ways for instructors to engage their students. There are space races in which students can compete in teams or as individuals to answer questions as quickly and accurately as possible. Polls allow instructors to receive student feedback.

3. Infuse Learning

Infuse learning is (was!) an excellent student response system for teachers who must support students with a variety of learning styles. With infusion a teacher can create questions, quizzes and writing prompts and send them to students who are participating in virtual classrooms or in an online learning program. What makes Infuse Learning unique is that it allows the teacher to give the student multiple response options.

4. Verso

This is a free utility that teachers can use to create virtual classrooms. Verso works with the teacher's Google Drive account. This means that links, files, videos, images, and documents from the instructor's Google Drive can be added to the Verso classroom for students to access. Students who enter the classroom will be shown new items that have been added to the classroom since their last visit.

https://www.emergingedtech.com/2015/09/top-5-multi-platform-student-response-systems/

Appendices #: ***Assessment Strategies***

1. Reflective writing

Give your students journals and ask them to reflect on the day's lesson by writing about what they learned as well as what they found challenging. Encourage them to explain how they might apply the lesson or skill they learned in real life. You can then review their entries to determine your students' level of understanding and identify areas to focus on.

2. Choral responses

A choral response is a quick and easy way to assess your students' understanding of a concept they just learned. Ask the entire class a question, and evaluate their level of understanding based on the number and type of responses you receive. This exercise also encourages all students to participate in the question-and-answer process.

3. Presentations

Have students give short presentations to you or the class sharing what they have learned about a particular topic. You could also ask them to summarise the lesson's most important concepts. Rather than grading the presentations, use them as an assessment tool to determine students' level of understanding.

4. Four corners

Four corners is an engaging assessment strategy that gets students moving around the room. Label each corner of the room with a different level of comprehension: strongly agree, agree, disagree and strongly disagree. State facts or details about the current lesson, and ask them to stand in the corner of the room that represents their response. Encourage students to explain why they chose a certain response so that you can make decisions about future lessons.

5. Lists

Midway through a lesson, pause and ask your students to list a certain number of things they've learned. Review their lists to determine if students are at the appropriate level of understanding. You can also use these lists to identify misunderstandings and areas you need to focus on more.

6. One-minute response

Ask your class a question about a topic, and give them one minute to write a response. Encourage them to focus on their ideas and information rather than correct spelling, grammar and writing conventions. Alternatively, you can ask your students to write a one-sentence summary of what they have learned about that topic. Look for detail and understanding in their responses.

7. Think-pair-share

Think-pair-share is useful for encouraging students to think critically about a topic and allowing you to check for understanding. Prompt students with questions about topics like what they learned from a lesson or how they connect with what you discussed in class today. Pair them with another student, and have them discuss their ideas. Reconvene as a group, and call on different pairs to ask them to share their thoughts.

8. Socratic seminar

Hosting a Socratic seminar empowers students to facilitate their own discussions to develop their ideas further. Students ask each other questions about a certain topic, text or starting question. This prompts more questions and comments to enhance their understanding of the main topic.

9. ABC brainstorming

ABC brainstorming challenges students to create a list of all the letters in the alphabet and write down something that begins with each letter that relates to the unit. This can be an effective individual, pair or group activity. Reviewing these lists may help you learn what students understand and what requires more attention, allowing you to modify your lesson plans as needed.

10. 3-2-1

This is another technique to encourage students to reflect on the lessons. It's particularly useful to check for understanding at the end of or near the end of lessons. While the format may vary, this strategy typically involves asking students to write down:

- Three things they learned
- Two things they want to learn more about
- One question they have about

11. Concept maps

Concept maps are useful for helping students visualize what they understand about a topic. Students can create individual concept maps, or this may be an activity you complete as an entire class. Start with the main topic or idea in the middle of the paper, then draw lines out to circles that discuss information related to it. Depending on the subject and the age of the students, you may also ask them to draw lines connecting similar ideas.

12. 30-second share

During a 30-second share, each student discusses something they learned during the lesson. Things like what the student discusses, what language they use and how their response connects to the learning targets can help you assess their understanding.

13. Graffiti wall

Creating a graffiti wall is another assessment strategy that may be useful for working with visual learners. Cover one of your classroom walls with a large piece of paper, and invite students to write or draw on it to show what they learned about a topic. Using this activity allows you to identify what students understand and what may require additional lessons for them to master. Consider completing this activity during the middle of a unit and leaving the wall up for them to continue to add to as they learn more.

Reference sources: *https://www.indeed.com/career-advice/career-development/assessment-strategies*

Appendices #: LESSON PLAN TEMPLATE

Appendices #: A Sample Scoring Rubric

Annotation 1

A statement (descriptors) describing the expected the level of competency for each prescribed criteria

Annotation 2

Rating scales includes either numerical or descriptive labels

Annotation 3

Indicators or qualifiers ensures that the levels reflect variance in quality

Annotation 4

Shaded descriptors indicating Student's Marks for the corresponding criteria

Criteria	Achieved 3	Progressing 2	Novice 1	Scoring
Collecting Data for Electronic Stock Taking System (ESTS)	**Well** organized paper with **clarity** identifying, classifying and enumerating the different items.	Organized paper with some **clarity** identifying, classifying and enumerating the different items.	**Poorly** organized paper that lacked **clarity** identifying, classifying and enumerating the different items.	2/3
Development of ESTS	**Collaboratively organise** and categorise data of different items. Illustrate the **most likeable** way the Data can displayed in the MS Excel Application format.	Display **some collaboration** to organise and categorise data of different items. Illustrate a **likeable** way the Data can displayed in the MS Excel Application format.	Display **very little collaboration** to organise and categorise data of different items. Illustrate a way the Data can displayed in the MS Excel Application format.	1/3
Content and Formulae Functions in ESTS	Typed **accurately all the appropriate contents** for each columns and typed in the **all correct** formulae function symbols for the 'SUMrange function' and 'SUMIF function' in **all** their correct MS Excel cell references	Typed **most contents** in their **appropriate** columns and typed in **most** of the **correct** formulae function symbols for the 'SUMrange function' and 'SUMIF function' in **some** of their MS Excel cell references	Typed **very few contents** in their **appropriate** columns and typed in **very few** formulae function symbols for the 'SUMrange function' and 'SUMIF function' in **very few** of their MS Excel cell references	3/3

Presentation of ESTS	**Displayed time consciousness** with **adequate** delivery skills (posture, language), **expected** communication skills and social skill (relativity and connectivity)	**Mostly** time consciousness with **some adequate** delivery skills (posture, language), **some** expected communication skills and **some** social skill (relativity and connectivity) displayed	**Very little** time consciousness with **little adequate** delivery skills (posture, language), **little** expected communication skills and **little** social skill (relativity and connectivity) displayed	3/3
Portfolio of ESTS Developments and MS Excel ESTS – The Product	A **comprehensive** portfolio with **all** the Steps in planning, designing and developing the ESTS with a **complete** and **functional** MS Excel of the ESTS.	A portfolio with **most** of the Steps in planning, designing and developing the ESTS with a **complete** and **malfunctioned** MS Excel of ESTS.	A portfolio with **very few** of the Steps in planning, designing and developing the ESTS with an **incomplete** and **malfunctioned** MS Excel of ESTS.	3/3
				12/15

Appendices #: **Steps in Developing a Rubric**

1. List the Main parts of the Unit Of Work for the Rubric.
2. Derive the purpose of Assessing the TASK in the Topic (Benchmark).
3. List the Lesson Title and Objective of the assessment task.
4. Organise how the Assessment Task would be done: Individually or in Groups.
5. Derive the Performance Standard from the Benchmark.
6. Describe the Minor Tasks under the Main Task Description.
7. Rephrase the Minor Tasks to create the Categories.
8. List Task Descriptions and Categorise them.
9. Unpack the Essential KSAV to be assessed from Task Descriptions.
10. Design the Rubric type and decide the point-scale rubric for the assessment task.
11. Re-word the Task Descriptions including KSAVs and create the Descriptors .
12. Use Appropriate Qualifiers for Descriptors for each Achievement Level.

Appendices #: Performance Assessment Template

Subject: _____

Strand:_____

Unit: _____

Content Standard: _____

Benchmark: _____

Topic: _____

Learning Objective: _____

Purpose of Assessment: _____

Assessment Strategy: _____

Duration: _____

Time/Date of Administration: _____

Due Date/Time: _____

Performance Standard: _____

Performance Tasks

Performance Assessment Criteria:_____

Assessment Scoring: _____

Scoring Tool: _____

Appendices #: **Project Rubric**

Category	Advanced	Satisfactory	Partial Credit	Unacceptable
	9-10 points	7-8 points	1-6 points	0 points
Quality/ Workmanship	**Maximum effort** was put forth to complete the project in a professional manner. Project **demonstrates a high degree of quality and attention to detail.** Workmanship is **excellent.**	**Some effort** was made to complete the project to a level that was sufficient for grading, but does not **meet a professional level of quality or appearance**. Workmanship is of **acceptable quality**.	**Minimal effort** was made to **complete the project and the quality** and workmanship is **sub-par, but still meets the minimal standard**.	**Little or no effort** was made to **produce a quality project**. Project obviously **does not meet minimal standards**.
Creativity/ Design	Project reflects **many fundamental elements of design and creativity**. Project demonstrates **an advanced understanding of creative thinking** and attention to aesthetics and presentation.	Project reflects **some of the elements of design and creativity**, but **lacks attention** to aesthetics and presentation.	Project was **completed, but does not reflect the acceptable levels of design and creativity**. **Effort was minimal** and project is mediocre at best.	Project was not **completed on time or reflects little or no effort to complete** assignment at an acceptable level.
Functionality	Project meets or exceeds the design requirements of purpose and functionality. All elements of the design have been met and the project does what it was designed to do.	Project meets some of the design requirements of purpose and functionality. Not all elements of the design have been met, but the project does what it was designed to do.	Project is somewhat functional, but reflects minimal effort. It is intermittent and doesn't always do what it was designed to do.	Project does not work and demonstrates a lack of effort or understanding of the basic elements of functionality and purpose.

Design Process	Project reflects a clear understanding and application of design process including evidence of research, brainstorming, design and problem solving, prototyping and testing.	Project reflects some understanding and application of accepted design loop principles and sequence including evidence of research, brainstorming, design and problem solving, prototyping and testing.	Project reflects minimal understanding and application of design process.	Project does not show evidence that design process was used. Project does not meet accepted levels of design criteria.
Criteria/ Constraints	Project was completed with all constraints and criteria met or exceeded. Reflects attention to detail and quality.	Project was completed with some of the constraints and criteria met. Reflects some attention to detail, but quality is minimal.	Project was completed with a few of the constraints and criteria met. Reflects minimal effort and lacks detail or quality.	Project was not completed and does not reflect the adherence to the constraints or criteria.
Time Management	Project completed and turned in on time. Student worked diligently when project time was available. Student was on task most of the time.	Project was completed, but had notable errors. Student utilized project time somewhat efficiently, but spent time socializing. Student was on task 70% - 80% of the time.	Project was not turned in on time and/or complete. The student was on task less than 60% of the time.	Project was not turned in on time and was not completed. Student wasted project time and at times was disruptive to others.

Resource Management	Always takes responsibility for use and care of all building components and resources. Always returns building components and materials to proper storage compartments.	Consistently takes responsibility for use and care of building components and resources. Somewhat consistent in returning building components to proper storage compartments.	Sometimes takes responsibility for use and care of building components and resources. Inconsistent in returning building components to proper storage compartments.	Does not take responsibility for the proper use and care of building components and resources. Is careless and does not practice proper storage and safety practices.
Teamwork	Notable teamwork shown with a determination to participate/contribute to team success. Completed required individual tasks that contributed to the success of the team.	Teamwork was noted, but was sometimes off task or working on non-related tasks. Contributed to the success of the team, but could have been more engaged to complete tasks sooner.	Notable time off-task with minimal effort given for team success, or did the project alone without relying on others to do their share of the project.	Was not a team player. Either took over project completely, or did not engage in team direction or plans.
Writing/ Reflection	Writing/reflection is very well organised and explained. Student includes all details in design process. Document has almost no grammatical errors.	Writing/reflection is somewhat organised and explained. Student includes most details in design process. Document has very few grammatical errors.	Writing/reflection is not organised and explained. Student includes only a few details in design process. Document has many grammatical errors.	Writing/reflection is incomplete or not turned in. Student includes no details in design process. Document has many grammatical errors.

Presentation	Presentation was well organised and presented in a logical sequence. Presentation reflects a full knowledge of the topic with clear answers and explanations to questions asked.	Presentation was fairly organised and most information presented in a logical sequence. Answers to questions were vague or lacked clarity or accuracy.	Presentation was unorganised and lacked a logical sequence. Presentation reflected little attention to detail. Answers to questions were inaccurate and confusing.	Presentation was not acceptable and reflects a lack of organisation or knowledge of the topic. Presentation shows little effort to meet expectations.

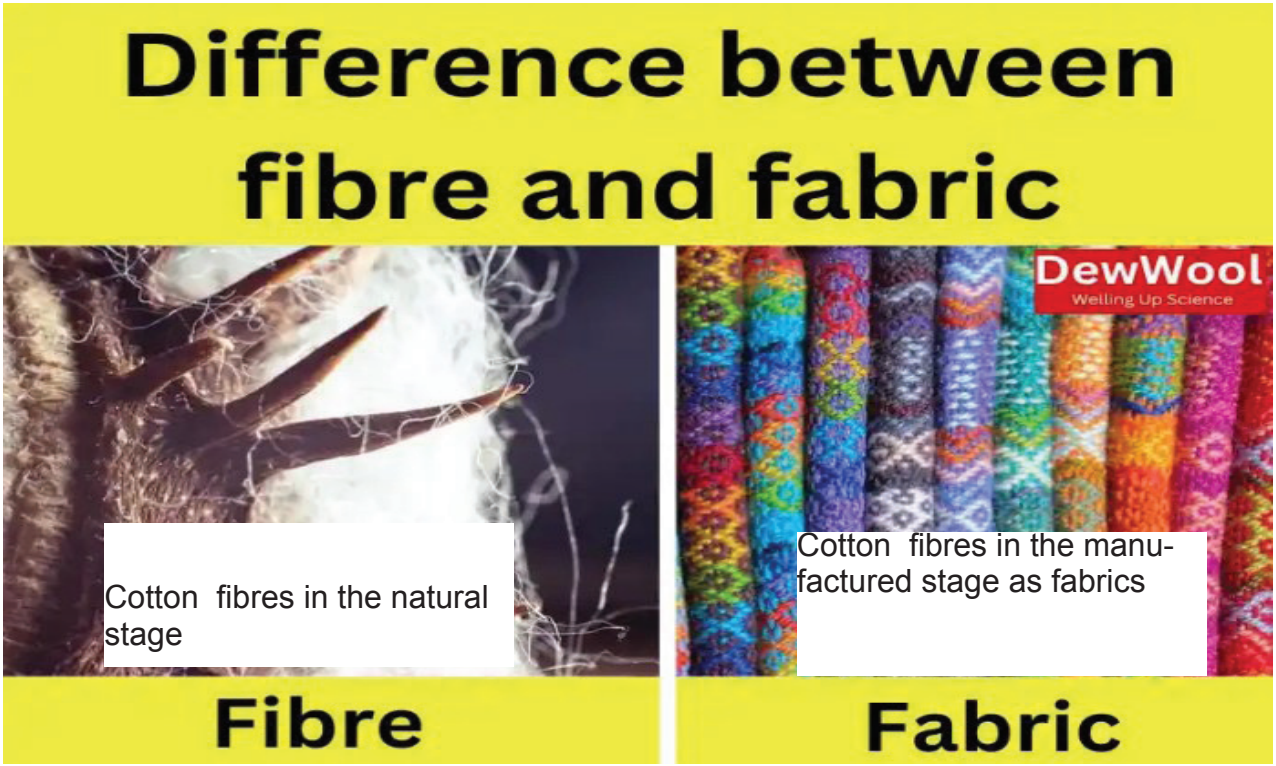
Appendix 7

This extra content knowledge that teachers will need to enhance the knowledge on Fibres and fabrics in the benchmarks of the first unit of this strand

10 Differences Between Fibre And Fabric

Fibre refers to the individual threads or strands that are used to make a yarn, which is then woven into a fabric. Fabrics, on the other hand, are the finished product that is created by weaving, knitting, or otherwise joining fibers together.

So the fiber can be compared to a brick used in the construction of a building, and the fabric is the building itself. The properties of a textile, such as strength, durability, and appearance, are determined by the type and quality of the fibers used. In this article, we discuss 10 differences between fibre and fabric.



* ***Difference between fibre and fabric***

Difference between fiber and fabrics:

Fibre refers to the individual threads or strands that is used to make fabrics. Fabrics, on the other hand, are the finished product that is created by weaving, knitting, or otherwise joining fibers together.

Fibers can be natural as well as synthetic. For example, fibres such as cotton, wool, and silk are natural, and fibres such as polyester and nylon are synthetic. They can also be blended together to create different types of fabrics. Fabrics, on the other hand, can be used to make a wide range of products, including clothing, blankets, and upholstery. They can also have different properties, such as being lightweight, stretchy, or waterproof.

In short, fibers are the raw materials that are used to make fabrics, and fabrics are the finished products that are created from those fibers. In the below table, we have tried to summarize the 10 differences between fibre and fabric based on different parameters like definition, hierarchy, origin, examples, production, properties, uses, durability, and cost.

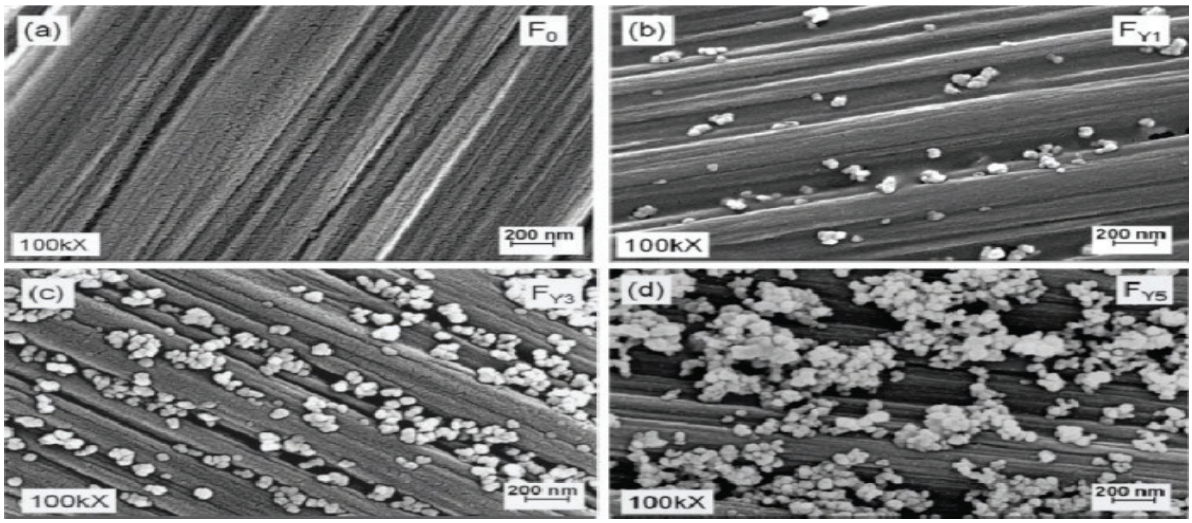
Differentiation	Fibre	Fabric
Definition	Fibre refers to the raw materials used to make fabric, such as cotton fibre is used to make cotton fibre, wool fibre is used to make woolen fabric, silk fibres to make silk fabrics, etc	Fabric refers to the finished product made from these fibers, such as cotton T-shirts, wool sweaters, and silk scarves.
Hierarchy	The raw material used to make textiles.	The finished product is made from fibers.
Origin	Can be sythetic or natural	can be a combination of synthetic and natural or pure.
Examples	Examples inclue cotton, wool, silk, etc	Examples include cotton shirts, wool suits, silk curtains
Processing	Can be spun into yarn or thread	Can be woven or knitted into various textures and patterns
Production	Fibre is produced through natural processes such as growing cotton plants or raising sheep for wool.	Fabric production involves spinning the fibers into yarn and then weaving or knitting the yarn into fabric.
Properties	Fibers have different properties such as absorbency, strength, and elasticity.	The property of the fiber affects the properties of the fabric, such as how well it absorbs moisture or how stretchy it is.
Uses	Fibres are used in a wide range of products, from clothing and textiles to industrial materials such as rope and insulation.	Fabrics are used primarily in clothing and home furnishings, but also in industrial and medical applications.

Durability	Fibres are generally more durable than fabrics as they can withstand more wear and tear.	Fabrics made from natural fibers such as cotton and linen are more durable than those made from synthetic fibers such as polyester.
Cost	Fibres are generally cheaper than fabrics as they are the raw materials used to make the fabric.	However, the cost of fabric can depend on the type of fiber used, the quality of the yarn, and the type of fabric.

Differences between fibre and fabric

Research articles to understand the difference between fibre and fabrics

In this article titled "Strengthening of a Fibre-Matrix Interface: A Novel Method Using Nanoparticles" authors have tried to improve the properties of a carbon fabric made from carbon nanofibers by adding Ytterbium nanoparticles on the surface of the individual fibres. They used electron microscopy to view the increased roughness of the fiber surface and the adhesion of NPs on the fiber surface.



Field emission scanning electron microscope images of a simple carbn fibre fabric and a nanoparticle modified carbon fibre fabric.

Is a yarn similar to a fibre?

A yarn is a long, thin strand (or thread) consisting of many fibers that can be woven into fabric. So, yarn is made up of many fibers, and fabric is made up of many yarns. Ply is a term used to describe the number of threads or yarns that are twisted together to create a single strand of thread or yarn. And Denier is used to measuring the fineness of a fiber or yarn, which is determined by the weight of the fiber or yarn per unit length. A warp in a fabric is a set of threads or yarns that run lengthwise in a fabric and are interlaced with the weft to create a woven fabric. A weft in a fabric is a set of threads or yarns that run width wise in a fabric and are interlaced with the warp to create a woven fabric.

Note: Your Assessment Plan must include the National Department of Education Observable events, Commemorated events and Official Public Holidays or any calendar dates that may disrupt schooling, to help you plan your termly assessment plans.