ZIMBABWE

MINISTRY OF PRIMARY AND SECONDARY EDUCATION

CURRICULUM DEVELOPMENT AND TECHNICAL SERVICES

DESIGN AND TECHNOLOGY

SECONDARY SCHOOL LEVEL

FORMS 1 - 6

2015-2022

TEACHER'S GUIDE

Curriculum Development Unit
P.O.BOX MP133
Mount Pleasant
Harare

ACKNOWLEDGEMENTS

The Ministry of Primary and Secondary Education would like to acknowledge the following for their valuable contributions in the compilation of this guide:

- Curriculum Development and Technical Services staff
- UNICEF for funding

CONTENTS..... PAGE

ORGANISATION OF THE GUIDE

This teachers' guide was created to guide you the teacher as you embark on teaching design in the new curriculum. We hope that it will make your undertaking easier and clarify most aspects in the Design and Technology syllabus. This Teachers' Guide will be divided into two sections; Part, A which covers critical documents, and Part B, which covers curriculum delivery

Part A - Critical Documents

- Curriculum Framework
- National syllabus
- School syllabus
- Scheme of work
- Lesson plan
- Progress records
- Learner Profile

Part B - Curriculum Delivery

- Content
- Objectives
- Methodology
- Teaching-learning materials
- Assessment and Evaluation
- Class Management
- Scope of the Guide

PART A: CRITICAL DOCUMENTS

Introduction

The critical documents will assist you the teacher in handling the Design and Technology learning area. After going through all the critical documents, it is hoped that you will be better able to guide learners in handling this new learning area. It is important for you to know the critical documents you should have in order to deliver the Design and Technology curriculum effectively. You should have the following:

- Curriculum Framework
- National Syllabus
- School syllabus
- Schemes of Work/Scheme Cum Plan
- Lesson Plans
- Learner Profile
- Progress Records
- Register of Attendance

Rationale

It is important for every teacher to know about the critical documents

Objectives

It is hoped that after going through this part, you will be able to:

- gain an insight into the philosophy of education underpinning the curriculum
- manage your class effectively
- mobilise the teaching and learning resources
- prepare engaging and appropriate teaching aids
- track the learner's progress during the learning process

UNIT 1

CURRICULUM FRAMEWORK FOR PRIMARY AND SECONDARY EDUCATION 2015-2022

Introduction

This is a policy document that outlines underpinning principles, national philosophy, learning areas, the description and expectations of MOPSE at policy level. It prescribes what the government expects you to deliver as you go about your duties. The document outlines the issue of skill-based approaches in every learning area. The document also clearly explains the aspiration of the Ministry of Primary and Secondary Education, which is to enable all learners to develop their capacities as successful learners confident individual, responsible citizen and effective contributors to Zimbabwe.

Objectives

- interpret the national syllabuses and translate them into meaningful and functional school syllabuses, schemes of work and record books
- prepare relevant daily teaching notes
- appreciate and understand the need to keep and maintain useful, comprehensive and up to date class records
- make and use relevant teaching and learning materials in the delivery of your lessons
- acquire and use effective teaching techniques suitable for the subject and level of learners
- acquire and demonstrate skills of setting reliable and valid test/ examination questions
- cope with specific problem areas in language teaching
- design appropriate strategies for problem solving
- manage your class effectively
- be resourceful
- guide learners to study effectively on their own
- objectively evaluate your own teaching and the learners' progress

Key Elements

- **Background**
- Introduction
- Definition of key terms
- Vision
- Mission
- Principles underpinning the curriculum
- Aims of the curriculum
- Determinants of the Zimbabwean Curriculum

- **Principles and Values Guiding the Curriculum**
- Philosophy Underpinning the Curriculum
- Policy Guidelines
- Generic Principles guiding the Curriculum
- Learner exit profiles

- **Goals of the Curriculum**
- Organisation of the Zimbabwe school curriculum
- Infant school goals

- Junior school goals
- Secondary school goals
- Learning outcomes

- **Learning Areas**
- The learning areas at Infant school level
- Cross cutting and emerging issues at Infant school level
- Junior school curriculum
- Phases of development and progression of the learning process
- Learning areas at secondary school level (Form 1 to Form 4)
- Emerging or Cross Cutting Issues at Form 1 to 4
- Life Skills Orientation Programme (LOP)
- Learning areas at Form 5 and 6

- **Teaching and learning Methods**
- Principles of teaching and learning
- Approach
- The leaning environment

- **Assessment and Learning**
- Assessment of skills, abilities and knowledge
- Relevance of school-based continuous assessment
- Assessment for learning (formative assessment)
- Assessment of learning (summative assessment)
- Assessment as learning
- Characteristics of assessment tools
- Strategies for assessment of knowledge, skills, values, and attitudes
- Relationship between continuous and summative assessment at various school levels

- **Strategies for effective implementation**
- Strategy for implementing the Framework
- The curriculum review cycle
- Stages of Curriculum development cycle

- **•The Future**
- Pillars of the curriculum framework
- Summary of exit profile
- Learning areas and outcomes
- Community and stakeholder participation
- Modes of assessment
- Regular curriculum innovation and renewal
- Action

UNIT 2

SYLLABUS INTERPRETATION

Every professional teacher needs to learn how to interpret the syllabus correctly.

Understanding Syllabus Interpretation

- Simply, it is the process of making sense of the syllabus.
- Interpretation is about finding meaning.
- It is the process of unpacking the syllabus, analysing it and synthesising it.

How do we interpret the Syllabus?

Syllabus interpretation focuses on the following:

- The national philosophy/vision as spelt out in the preamble (as derived from the Framework)
- The syllabus aims and objectives – What does the syllabus intend to achieve within the learners?
- The content – Knowledge, skills and attitudes i.e. competences. Content constitutes the heart of the syllabus. Thus, syllabus interpretation facilitates braking down of content into teachable units

Types of Syllabuses

- **National Syllabus**
- **School syllabus**

National Syllabus

It is a policy document that outlines and specifies the learning area philosophy, aims and objectives, Learning/teaching concepts and content, suggested methodology and assessment criteria at every grade level. As a teacher you should always have it and use it to guide you in your day to day teaching and learning activities.

The National Syllabus

A national syllabus is a major curriculum document which:

i. prescribes what government would like to see taught in all schools as spelt out in the curriculum framework.
ii. outlines the experiences that learners should undergo in a particular course of study - infant, junior, secondary.
iii. specifies the learning area philosophy, objectives, content, methods, evaluation and assessment criteria.
iv. teachers are required to teach from
v. examinations are set from
vi. defines aims, content, assessment objectives, methodology and examination format

What are:

Aims: general direction in which you should be guiding your learners (long term)
Objectives: learner behaviour after treatment
Assessment objectives: examination oriented (what is to be tested)
Content: topics or aspects to be covered
Methodology: teaching approaches to achieve desired learning outcomes. Learner-centred approaches allow learners to practice skills learnt
Examination format

- **ASSESSMENT**

Elements
The syllabus consists of:

- Cover page
- Acknowledgements
- Contents page
- Preamble
- Introduction
- Rationale
- Summary of content
- Assumptions
- Cross Cutting Issues
- Aims
- Objectives
- Methodology and Time Allocation
- Topics
- Competence Matrices
- Content Matrix
- Assessment

2.2 School Syllabus(A breakdown of the national/official syllabus)

It is a breakdown of the national syllabus and is drafted at the school level with experts from the learning area. This must be done at school level from the National Syllabus by reorganising content taking into account local factors.(see section…on Syllabus Interpretation)

Factors Influencing drafting:

- National goals and subject options available on national list- Give national identity and philosophy and as well address national needs
- The learner's physical, mental and emotional state:
- Physical: consider disabilities, complexity of manipulative skills.
- Mental: consider level of maturity and cognitive development.
- Emotional state: consider values and attitudes to be developed.
- Resource availability: Consider the facilities and materials available. - Consider the qualifications, number, experience and level of training of personnel available.
- Community influences: Consider the religion, beliefs and values of the local people.
- Evaluation system and strategies: Consider how the curriculum is evaluated and whether it will be possible to evaluate effectively in a particular school environment.
- Time allocation in the official syllabus for the covering of the syllabus
- Local conditions that affect the choice and sequencing of topics
- Education technology
- Elements (Structure of school syllabus)
- Aims: broad indication of what the learners should learn
- Objectives: learner behavior at the end of the teaching-learning experience
- Topics/activities (content)
- Methodology (learner – centred)- teaching approaches to achieve desired learning out comes. Learner-centred approaches allow learners to practice skills
- Instructional or teaching materials
- Assessment

UNIT 3

SCHEME OF WORK (WEEKLY BREAKDOWN)

By the end of this unit, you should be able to:

- describe the essential components of a scheme plan
- develop a scheme plan
- explain the advantages of writing down your plan
- realise the merits of planning your lessons well in advance

Scheme of work

This is a document that you as a teacher should draw from the national and school syllabus. You should outline the objectives, activities, content, methodologies and media. You should draw your scheme of work well in advance ahead of the lesson delivery date.(use of ICT tools in drawing the documents is encouraged.

Furthermore, a Scheme of work is a plan for something. Your scheme of work is therefore a plan of action, which should enable you to organize teaching activities ahead of time. It is a summarized forecast of work, which you consider adequate and appropriate for the class to cover within a given period from those topics, which are already set in the syllabus. A well-prepared Scheme of work does the following:

- Give an overview of the total course content
- Provide for a sequential listing of learning tasks
- Show a relationship between content and resource materials
- Provide a basis for long range planning, training and evaluation of the learning area

A Scheme of work can be made to cover one week, one month, or even one term. Each year is divided into three terms each with approximately three months or thirteen weeks. A scheme of work should be made for each term, ideally before classes begin.

When you are preparing a scheme of work, you should consider the following:

- **Understanding the syllabus**

  As a classroom teacher, you may not have been involved in curriculum development but you are expected to interpret and implement it correctly. This calls for a thorough understanding of the syllabus and the content in order to achieve the stated objectives. The teacher is expected to act like a policemen or a judge who is called upon to administer the law though he did not make it. It is therefore important for you to be thoroughly conversant with the curriculum in order to implement it successfully.

- **Syllabus content**

  Topics in the syllabus may not be arranged in the order they are supposed to be taught. Some topics will require the knowledge of previous ones while others are quite independent. You should not only identify essential learning content but also arrange the content in a logical teaching order considering preceding and succeeding syllabus content. Related subjects should also be considered when scheming. Quite often the teaching of a given topic may be impeded by a lack of skills or knowledge to be acquired in a different subject for example, learners may be unable to write a composition on soil conservation if they have not covered the topic in geography or science.

- **Reference materials**

You should be familiar with available reference material necessary for effective coverage of the topics in the scheme of work. There is nothing more disturbing than finding out that a topic that has already been covered could have been more interesting, enjoyable and better understood if certain materials or teaching aids that are available in the school had been utilized.

- **Assessment**

Learners will be assessed in both continuous and summative methods. Your scheming should reflect this. Some levels require more revision time than others and therefore scheme for revision appropriately. Projects for continuous assessment, research or public performances should also be schemed for.

- **Time allocation**

While a term has thirteen weeks, it is not possible to use all of these for effective teaching because there could be predictable and unpredictable interruptions for example, public holidays, internal examinations, open days, sports days, visits from district, province etc. Therefore you should scheme with this in mind.

COMPONENTS

The components of a scheme of work include the following aspects:

- **Level of learners:** state the level (grade/form) of learners you are scheming for.
- **Learning Area:** indicate the learning area you are scheming for
- **Week ending:** the date should be clearly indicated
- **Topic/Key concepts/Skills:** topics should follow the order, which they are supposed to be taught, from simple to complex.
- **Objectives:** each lesson should have objectives, which pinpoint the anticipated learning behaviour of the learners. The objectives must be stated in a manner that there is a measurable aspect manifested at the end of the lesson for example, learners should be able to conduct fire drills.

FORM 1 SCHEMES OF WORK

Learning area: Design and Technology

Aims

- develop confidence, creativity, competency and responsibility in designing products
- to solve local problems and engage in inventions for the community, nation and the
- ever changing technological world
- acquire design thinking skills
- foster a range of transferable skills and attitudes
- make aesthetic, economic, moral and technological value judgment in design
- develop enterprising skills through problem solving
- develop an awareness of design in the areas of social, culture and environment
- Demonstrate innate talent that lead to originality and innovativeness

WK-ENDING	TOPIC/ CONTENT	OBJEC-TIVES	COMPETEN-CIES	MEDIA	S.O.M/ REFERENCES	METHODS AND ACTIVITIES	EVALUATION
13/05/16	Workshop safety Health and safety Hazard warning signs	Learners should be able to: -Administer first aid in a working environment -Identify different hazard warning signs	Following instructions Respectof each other Precisition Team work Alertness Orderliness Rationalising	Tools Machines Empty bottles Plastics Scrap metal Shavings Firefighting equipment	-Design and Technology Form 1-4 syl page 11 -Design and Technology Trs' Guide book page .. -Design and Technology pupils' book page .. -I.C.T tools	Conducting fire drills regularly Simulating first aid operations Constructing waste bunkers and disposing waste appropriately Demonstrating the safe use of tools and machines	Should show strength and weaknesses of methodology, and whether objectives were achieved. Map the way forward. This forms the basis for remedial work

UNIT 4

Lesson Plans

This is a detailed daily plan of what you intend to deliver during the lesson. This is to be used in the event of you having drawn a scheme of work rather than a scheme cum plan.

DETAILED LESSON PLAN

CLASS: **Form 1**
LEARNING AREA: **Design and Technology**
DATE: **22 April 2016**
TIME: **1030hrs – 1130hrs**
TOPIC: **Health and Safety**
Key concept: **Workshop Safety**
Sub-concept:

- Personal safety
- Workshop safety
- Tools safety
- Basic machines
- Fire drills

S.O.M.: -Design and Technology (Form 1-4) syllabus page 60-61

- Design and Technology Teachers' Guide Book page ……
- Design and Technology pupils' book page …….

MEDIA: fire extinguisher, empty bottles of different chemicals,

ASSUMED KNOWLEDGE:
Learners have knowledge on safety from their primary Science and Technology learning area

LESSON OBJECTIVES
During the lesson learners will:

- demonstrate fire drills
- administer First Aid in a working environment
- state regulations and precautions to be observed when using different types of tools and equipment
- use tools and equipment safely

ACTIVITIES

- Conducting fire drills regularly
- Demonstrating the safe use of tools and machines

INTRODUCTION: Learners brainstorm the dangers of fires
Stage 1: Learners identify the advantages and disadvantages of using tools and machinery properly.
Stage 2: Learners in groups match tools and machines to their uses.
Stage 3: Learners conduct fire drills whilst in groups.
Stage 4: Learners come up with proper ways of helping someone whose clothes caught fire
Conclusion: Learners and the teacher summarise their discoveries by discussing the importance of observing safety in the workshop and also the use of fire drill drills in schools and institutions

LESSON EVALUATION:

Strength: .....
.....
.....
.....

Weaknesses: .....
.....
.....
.....

Way forward: .....
.....
.....
.....

UNIT 5

RECORD KEEPING

Records are critical documents about the teaching – learning process, which you must keep as a teacher
They include:
- Syllabuses (National and School)
- Staff and pupil details
- Examination documents
- Mark lists
- Stock control registers

OBJECTIVES
By the end of this unit, you should be able to:
- identify the various records you are expected to keep
- prepare accurate records
- Interpret information from records to promote learning
- Maintain and keep records safely
- Appreciate the need to update records regularly

TYPES OF RECORDS
- Official syllabuses
- School syllabuses
- Attendance Register
- Records of staff details
- Records of learner details
- Supervision records
- Files, circulars, handouts, past exam papers
- Minutes of meetings
- Inventory of resource materials
- Stock control registers
- Learner Profiles
- Attendance Register

Learner Profiles

Profile assessment is a quality assessment tool designed for a variety of learners to determine their strengths and identify areas of improvement. As a teacher, you should carry out profiling to track learner behaviour, knowledge, attitudes, aptitudes, skills, values and performances on an on-going basis. This assessment informs teaching and learning process and contributes to learner profile.

Progress Record
You should have a progress record to capture learner performances.

- Registers Learner Profile
- Progress Records
- Register of Attendance

Attendance Register
This is a critical document you should have as a teacher to track and record your learner's class

or lesson attendance.

CONCLUSION

Critical Documents are a must that each you as a teacher must have it for effective teaching and learning to take place

PART B CURRICULUM DELIVERY

Introduction

The educational philosophy of the syllabus is concerned with the development of skills and ethical attributes (Unhu/Ubuntu/Vumunhu) that will emphasize the learners' role in making and shaping the environment whilst adding value to it. This will encourage the learner to employ problem-solving skills to produce functional products using appropriate tools and materials for the community, nation and global markets. The syllabus sets out to promote desirable enterprise, recreational and other life skills relevant to the contemporary society. The syllabus will enable learners to explore numerous Design and Technology career opportunities. This will also encourage learners to value the use of multi- materials; Science, Mathematics and other related learning areas in a sustainable manner.

The Design and Technology syllabus enables learners to develop skills in:

- Design thinking
- Problem solving
- Leadership
- Enterprising
- Communication
- Creativity
- Invention
- Innovation

OBJECTIVES

By the end of this unit, you should be able to:

- select appropriate teaching methods for your lessons
- design meaningful and effective instructional material
- use a variety of learner-centred approaches
- plan and organise educational tours
- help pupils carry-out projects or experiments
- make good quality aids from available resources (Types: charts, chalkboard, whiteboard, computers,
- slides, films, videos, flannel graph, textbooks)

METHODOLOGY

As a teacher it is important for you to use problem solving and learner–centred approaches. You are the facilitator and the learner is the doer. You should select appropriate teaching methods for your lessons. They should be varied and motivating. You should select one or several methods depending on:

- The subject matter
- Instructional objectives
- The learner
- Your personality
- Learners level of development (cognitive, affective and psychomotor))
- Content to be covered
- The time
- Instructional materials
- The environment
- Competencies to be developed

Teaching methods can be grouped under three main categories:

a. Cognitive development methods
b. Affective development methods
c. Psychomotor development methods

a) Cognitive development methods

These are mainly:

- Discussion Method
- Questioning/Socratic Method
- Team Teaching Method
- Talk Chalk/Recitation Method
- Field Trip/Educational tours Method
- Futures wheel
- Futures wheel
- Team Teaching Method
- Question and Answer

b) Affective development methods

- Modelling Method
- Simulation Method
- Dramatic Method
- Simulation Games
- Role-Playing Method
- Gallery walk
- Observation
- Lecture

c) Psychomotor development methods

These are more learner activity based and heuristic

- Inquiry Method
- Interactive e-learning
- Discovery Method
- Process Approach Method
- Demonstration Method
- Laboratory/Experimentation Method
- Programmed Learning Method
- Dalton Plan/Assignment Method
- Project Method, case studies
- Microteaching Method
- Mastery Learning
- Song and dance
- Your subject matter should determine the most suitable teaching method/methods to use.
- The instructional objectives to be achieved by the end of the lesson also determine the choice of teaching methods.
- You must be very familiar with the teaching methods you want to use and be convinced they are the most appropriate for that lesson.
- You must consider the age, interest, level of development of the learners and ensure that all learners will benefit from the method you have chosen.
- You must consider time in relation to the methods chosen.
- You should consider the environment and the size of the class in settling for methods to employ.

The following methods are suggested for you:

- Simulation
- Role play
- Experimentation
- Project
- Field trips
- Demonstration

INSTRUCTIONAL (TEACHING-LEARNING) AIDS

These are materials that enhance the teaching- leaning process. They assist you the teacher to achieve desired objectives while in learners they help in concretising the concepts. They help learners learn better and faster, motivating them and stimulating interest.

Objectives

By the end of this unit, you should be able to:

- select appropriate instructional aids
- make good quality aids from available resources
- use instructional aids effectively
- Design meaningful and effective instructional aids

- help learners to learn better and faster
- capture learners` interest
- create virtual reality

Selecting appropriate instructional aids
When selecting instructional aids, you have to consider the following;

- Topic
- Level of learners
- Available resources
- Environment
- Number of learners

These teaching-learning aids should be of good quality and user friendly considering the available resources in the school. Examples of teaching-learning aids appropriate in teaching Design and Technology are;

- Charts
- ICT tools
- Textbooks
- Newspapers
- Magazines
- Mobiles
- Work cards

Instructional aids should be used effectively, they must serve the purpose they are meant for rather than be mere window dressing. You should design your media with the topic in mind. Charts and cards must be clearly written, with visible colours and correct size of script for the level of learners. Electronic equipment should be checked before the lesson so that it is in good working order. If using complicated technical aids, make sure you practice beforehand so that you do not embarrass yourself in front of the class.

ASSESSMENT AND EVALUATION

- Measuring the success of teaching in terms of teacher and learner performance
- Provides feedback on the acquisition of knowledge, skills and attitudes by learners

Objectives

By the end of this unit, you should be able to:

- evaluate both your work and that of the learners
- identify the essential evaluation methods that you can use
- prepare marking schemes for the various activities or projects

Methods of evaluating

- Tests and exercises
- Projects
- Examinations
- Assignments

CLASS MANAGEMENT

This is a process of planning, organising, leading and controlling class activities to facilitate effective learning

Objectives

By the end of this unit, you should be able to:

- create an effective learning environment
- motivate the learners
- maintain discipline
- supervise class activities

Organisational skills for effective learning

This covers classroom organization from:

- **Physical environment**
- Clean, tidy and airy classroom and furniture arranged carefully for safety and teaching aids that are visible to learners.
- **Emotional environment**
- You need to be firm yet warm and pleasant. As a teacher you must set the right tone, telling your learners what behaviour you expect from them.
- **Grouping**
- You may group your learners according to needs, abilities, and problems but never by sex. Encourage them to share ideas in groups.
- **Class control and discipline**
- You must be knowledgeable of the school policy on discipline. A good teacher must always be firm but fair. Good behaviour must be acknowledged and punishments must be corrective not cruel. Make use of prefects and monitors You should create an atmosphere of trust and honesty in your class and aim for intrinsic discipline.

- **Motivation**
  As a teacher you must make your learners feel important through recognizing and rewarding achievements, as encouraging those who are lagging behind. Rewards should not be food, but positive remarks, or items related to learning like pencils and crayons or even displaying their work on the wall. Calling pupils by their names creates good rapport with your class. You should also be a role model to your learners by the way you handle yourself.
- Supervision
  You must check learners' work in order to guide and correct them in all areas from group discussions, games, field trips and even when they are going to the convenience rooms.

UNIT 6

SYLLABUS TOPICS

The Form 1-4 syllabus consists of nine compulsory topics listed below:

1. Health and safety
2. Product design
3. Material science
4. Systems and control
5. Engineering science
6. Tools and equipment
7. Manufacturing
8. Design drawings
9. Enterprise skills

TOPIC

HEALTH AND SAFETY

Objectives (learner – behaviour)

By the end of the unit learners should be able to:

- explain the importance of Design and Technology to the community and the nation
- classify tools according to their uses
- demonstrate the safe use of tools and machines
- conduct fire drills
- construct waste bunkers

Sub topic

- **Workshop Safety**

- Personal
- Workshop
- Tools
- Basic machines
- Fire drills
- First aid
- Waste disposal
- Hazards warning signs

- First Aid

- Cuts
- Burns
- Electric shocks
- First Aid Kit

ACTIVITIES

- Educational touring to observe indigenous designs and waste dumping sites
- Listing designing activities done in their community and nation
- Discussing the benefits of designing activities done in their community and the nation
- Matching the tools to their uses
- Collecting and grouping tools according to their uses
- Sketching tools

- Designing and keeping an inventory of tools
- Discussing the safe use of tools and machines
- Demonstrating the proper use of tools and equipment
- Listing waste management practices done in their community and nation
- Conducting fire drills regularly
- Simulating first aid operations
- Constructing waste bunkers and disposing waste appropriately
- Demonstrating the safe use of tools and machines
- Naming contents of a First Aid kit
- Simulating of first aid operations and activities

METHODOLOGY (learner - centredness)

- Project based learning
- Educational tours
- E-learning
- Collections
- Demonstrations
- Resource person(s)

TEACHING-LEARNING AIDS

- First Aid Kit
- Fire-fighting equipment
- Resource persons
- ICT Tools
- Print Media
- Audio and Visual Materials
- Educational tours

ASSESSMENT

Learners will be assessed on:

- Proper use of tools and equipment
- Hazards warning signs
- Waste management
- The importance of fire drills to the family, community and school at large
- Application of health and safety measures as they relate design
- The classification of farming implements and tools according to use
- Correct use and maintenance of any given Design and Technology tools, equipment and machinery

TOPIC 2

PRODUCT DESIGN

Objectives (learner – behaviour)

By the end of the unit learners should be able to:

- outline historical developments of Design and Technology
- relate the developments to current Design and Technology situations
- dentify needs and opportunities for design
- produce design specifications for problems identified

- generate ideas as potential solutions to problems
- produce an artefact based on their design solution
- test and evaluate the final product
- discuss the relationship between Design and Technology and other learning areas
- outline career opportunities related to Design and Technology

SUB TOPICS

History of design technology

- Indigenous architecture and inventions
- Gothic architecture
- Stone age designs and inventions
- Industrial revolution inventions

Introduction to design process

Design process cycle

- Design situation
- Research
- Generation of ideas
- Development
- Realization
- Testing and evaluation

Related learning areas

- Related learning areas (Science, Technology, Engineering and Mathematics: STEM)
- Career opportunities

ACTIVITIES

- Outlining historical developments of Design and Technology
- Relating the developments to the current Design and Technology situations
- Identifying and describing needs and opportunities for design
- Formulating design specifications
- Generating possible solutions
- Producing artefacts
- Testing and evaluating the final product
- Compiling design folios

- Discussing the relationship between Design and Technology and other learning areas
- Outlining career opportunities

- Conducting educational tours

METHODOLOGY (learner - centredness)

Project based learning

- Educational tours
- E-learning
- Collections
- Group work
- Demonstrations
- Resource person(s)
- Research and presentations

TEACHING AND LEARNING AIDS

- Museums
- ICT tools
- ICT tools
- Educational tours
- Exhibitions

ASSESSMENT

Learners will be assessed on:

- Design appreciation
- Designing and marking of artefacts

NOTE- Do the same on the rest of the topics for all forms

SYLLABUS TOPICS FOR FORM 1 TO 4

FORM 1 SYLLABUS TOPICS	FORM 2 SYLLABUS TOPICS	FORM 3 SYLLABUS TOPICS	FORM 4 SYLLABUS TOPICS
Health and safety	Health and safety	Health and safety	Health and safety
Product design	Product design	Product design	Product design
Material science	Material science	Material science	Material science
Systems and control	Systems and control	Systems and control	Systems and control
Engineering science	Engineering science	Engineering science	Engineering science
Tools and equipment	Tools and equipment	Tools and equipment	Tools and equipment
Manufacturing	Manufacturing	Manufacturing	Manufacturing
Design drawings	Design drawings	Design drawings	Design drawings
Enterprise skills	Enterprise skills	Enterprise skills	Enterprise skills

SYLLABUS TOPICS FOR FORM 5 AND 6

FORM 5 SYLLABUS TOPICS	FORM 6 SYLLABUS TOPICS
Health and Safety	Health and Safety
Product Design	Product Design
Materials	
Systems and Control	Systems and Control
Graphic Design	Graphic Design
Value Addition and Beneficiation	Value Addition and Beneficiation
Intellectual Property Rights	Intellectual Property Rights
Enterprise Education	Enterprise Education

CONCLUSION

This guide is not there to kill your innovativeness but just assist you as you embark teaching this new learning area. Any contributions that will improve our Teachers' Guide are welcomed. Just forward those contributions to Curriculum Development and Technical Services.

SCOPE AND SEQUENCE CHART FORM 1 TO 4

TOPIC	FORM 1	FORM 2	FORM 3	FORM 4
7.1 HEALTH AND SAFETY	• Workshop safety • First Aid	• Safe use of tools and equipment • Safe handling of materials • Safety consideration for power sources • First Aid	• Protective clothing • Tools and equipment • First Aid	• Hazardous substances • Safety in the workshop • First Aid
7.2 PRODUCT DESIGN	• History of design • Introduction to the design process • Related learning areas and careers	• History of design • Introduction to the design process • Related learning areas and careers	• The design process • Design projects • Cultural and technological influences on design products • Design tools	• The design process • Design Project management
7.3 MATERIAL SCIENCE	• Types of materials • Uses of materials	• Properties of materials	• Production of materials • Properties and uses of materials	• Shapes, forms and uses of materials • Properties of materials • Finishing
7.4 SYSTEMS AND CONTROL	• Design and making • Electronics • Energy • Groups of systems and control	• Joining and assembly • Visual communication • Structures and mechanisms	• Energy • Testing and evaluation • Structures and mechanisms	• Levers • Gear mechanisms • Drivers: Belts and Chains
7.5 ENGINEERING SCIENCE	• Engineering communication	• Calculations on machines	• Calculations on advanced machines	• Calculations on advanced machines

TOPIC	FORM 1	FORM 2	FORM 3	FORM 4
7.6 TOOLS AND EQUIPMENT	• Classification: - measuring and marking out tools - holding and supporting tools - Precision and impelling tools	• Handling and maintenance of tools and equipment	• Classification of machines	• Maintenance of tools and equipment
7.7 MANUFACTURING	• Manufacturing processes	• Manufacturing processes	• Industrial plant layout	• Manufacturing systems
7.8 DESIGN DRAWINGS	• Drawing principles • Geometrical constructions	• Geometrical constructions • Types of projections	• Production drawings • Introduction to Computer Aided Drawing	• Production drawings • Computer Aided Drawing
7.9 ENTERPRISE SKILLS	• Environment and social responsibility • Aesthetics	• Ergonomics and anthropometry • Design project	• Marketing strategies • Design project	• Market influences • Design project • Quality assurance and control

SCOPE AND SEQUENCE FORM 5 AND 6

TOPIC	FORM 5	FORM 6
HEALTH AND SAFETY	• Disaster management • Workshop management	• Industrial waste management
PRODUCT DESIGN	• Cultural and technological influence on design • Practical design application	• Practical design application • Environment and sustainability
MATERIALS	• Engineering materials and their applications	
SYSTEMS AND CONTROL	• Structures • Mechanisms • Electronics	• Structures • Mechanisms • Electronics
GRAPHIC DESIGN	• Applied geometry • Computer Aided Design (CAD)	• Application of graphic products
VALUE ADDITION AND BENEFICIATION	• Management of local resources	• Management of local resources
INTELLECTUAL PROPERTY RIGHTS	• Patenting	• Patenting
ENTERPR ISE EDUCATION	• Business management	• Career opportunities