

TECHNOLOGY EDUCATION PROGRAMME

SYLLABUS

(Form IV&V)

Technology Education Development Unit Naxxar Education Division

TECHNOLOGY EDUCATION

Opportunities of application of the Design and Make process

1 BRIEF

1.1 Formation of a design brief.

The student will be given the opportunity to

- 1.1.1 realise that every product satisfies a need and a purpose within a situation.
- 1.1.2 analyze the condition relative to the product in a given situation.
- 1.1.3 formulate a brief from a given situation.

2 INVESTIGATION

2.1 Collection of information

The student will be given the opportunity to

- 2.1.1 realise the importance to investigate similar situations, as expressed in the brief, to identify the relevant aspects.
- 2.1.2 collate information with reference to the relevant aspects.
- 2.1.3 identify the main aspects that could influence the design requirements.
- 2.1.4 establish the main design requirements and put them in an order of priority.

3 IDEAS

3.1 Generating ideas

The student will be given the opportunity to

- 3.1.1 analyse similar products / systems as sources of information.
- 3.1.2 suggest improvements on the derived ideas.
- 3.1.3 communicate ideas verbally and graphically with annotations.

4 EVALUATING IDEAS

4.1 Selecting

The student will be given the opportunity to

- 4.1.1 select idea/s that best fit the design requirements.
- 4.1.2 select idea/s that best considers the constraints.
- 4.1.3 select idea/s according to personal appeal.

5 DEVELOPMENT

5.1 Materials and Components

The student will be given the opportunity to investigate

5.1.1 the physical properties of materials:-

5.1.1.1 Plastics - Thermosetting
- Thermoplastic.

5.1.1.2 Wood - Natural
- Manufactured boards.

5.1.1.3 Metals - Alloys (ferrous or non-ferrous)
- Pure (ferrous or non-ferrous).

5.1.1.4 Textiles and fabrics - Natural
- Man-made.

5.1.2 the characteristics of materials produced from organic / inorganic and / or recycled waste products.

5.1.2 the characteristics of the components in a system.

5.1.3 the physical properties of fluids (fuels and water).

5.2 Foods

The student will be given the opportunity to investigate

5.2.1 foods produced by the biotechnological processes of fermentation..

5.2.1 methods of food preservation.

- 5.2.2 how additives affect health, shelf life.
- 5.2.3 by-products or wastes of food products.
- 5.2.4 nutritional values of foods.
- 5.2.5 industrial processes used in the production of food.

5.3 Structures

The student will be given the opportunity to investigate

- 5.3.1 types of structures.
- 5.3.2 the factors that help to reinforce structures.
- 5.3.3 types of forces existing in structures - mainly tensile and compression.

5.4 Energy

The student will be given the opportunity to investigate

- 5.4.1 different forms of energy.
- 5.4.2 different sources of energy.
- 5.4.3 different types of stored energy.
- 5.4.4 the use of recycled wastes and by-products to produce fuels.
- 5.4.5 conversions of energy.

5.5 Systems

The student will be given the opportunity to investigate

- 5.5.1 the Input – Process – Output of a system.
- 5.5.2 simple electrical switching systems.
- 5.5.3 simple electronic switching systems using transistor/s.
- 5.5.4 simple mechanical systems that include change/s of type, magnitude and direction of a motion.

5.6 Method of Production

The student will be given the opportunity to investigate methods of

- 5.6.1 marking out.
- 5.6.2 removal of material.
- 5.6.3 hot and cold bending processes.
- 5.6.4 joining.
- 5.6.5 finishing.
- 5.6.6 securing work.

5.7 Agriculture

The student will be given the opportunity to investigate

- 5.7.1 alternative methods of agriculture
 - organic and conventional farming
 - genetic engineering
 - hydroponics
 - cloning
 - hybridisation.
- 5.7.2 alternative methods of aquaculture
 - fish farming
 - penning.
- 5.7.3 the effects of agriculture and aquaculture on the environment.

5.8 Establishing Technical Details of a product / system.

The student will be given the opportunity to

- 5.8.1 establish working details with regard to materials, size and methods of production.
- 5.8.2 investigate the aesthetic, ergonomic details and safety use of a product or a system to be produced.
- 5.8.3 investigate the need to make a model to check for functionality and aesthetic values.

6 PLANNING

6.1 Design communication

The student will be given the opportunity to

- 6.1.1 prepare 2-D and / or 3-D working drawings.
- 6.1.2 prepare a layout and / or circuit diagrams of simple mechanical and electrical systems.
- 6.1.3 to include different annotations in working drawings.

6.2 Organizing resources

The student will be given the opportunity to

- 6.2.1 prepare a Part's List of materials.
- 6.2.2 prepare a Component's List.
- 6.2.3 identify the requirements of special tools and equipment, if any.

6.3 Prepare an Action Plan

The student will be given the opportunity to

- 6.3.1 identify the main tasks to carry out the work.
- 6.3.2 establish the sequence and the time to carry out the tasks.

7 MAKING

7.1 Health and Safety

The student should

- 7.1.1 be aware of safety rules and regulations and the manufacturers' instructions when using tools and products.
- 7.1.2 recognize the hazards and risk to themselves and others during the work process, and assess the effect on the environment.
- 7.1.2 take action to control these risks.

7.2 Manufacturing process

7.2.1 The student should be involved in these processes:-

- marking out – securing of work – cutting – drilling – planing – filing – bending -
joining – finishing and assembling.

7.2.2 The student should be involved in the use of formers, fixtures and jigs.

7.3 Food preparation

7.3.1 The student should be involved in these processes:-

- fermentation – preservation – presentation – cooking - baking – marinating.

7.3.2 The student should be aware of industrial processes in the production of food.

8 TESTING

8.1 Strengths and Weaknesses of the Product.

The student should

8.1.1 examine the product critically to identify its strengths and weaknesses.

8.1.2 acquire other peoples' opinion.

8.1.3 carry out tests for its safe and efficient use.

8.1.4 suggest ways of improving the product / system.

9 EVALUATION

9.1 Strengths and Weaknesses of the design process.

The student should

9.1.1 review the design stages to identify deficiencies and good points in the application of the design process with regard to – time, cost, aesthetic etc.