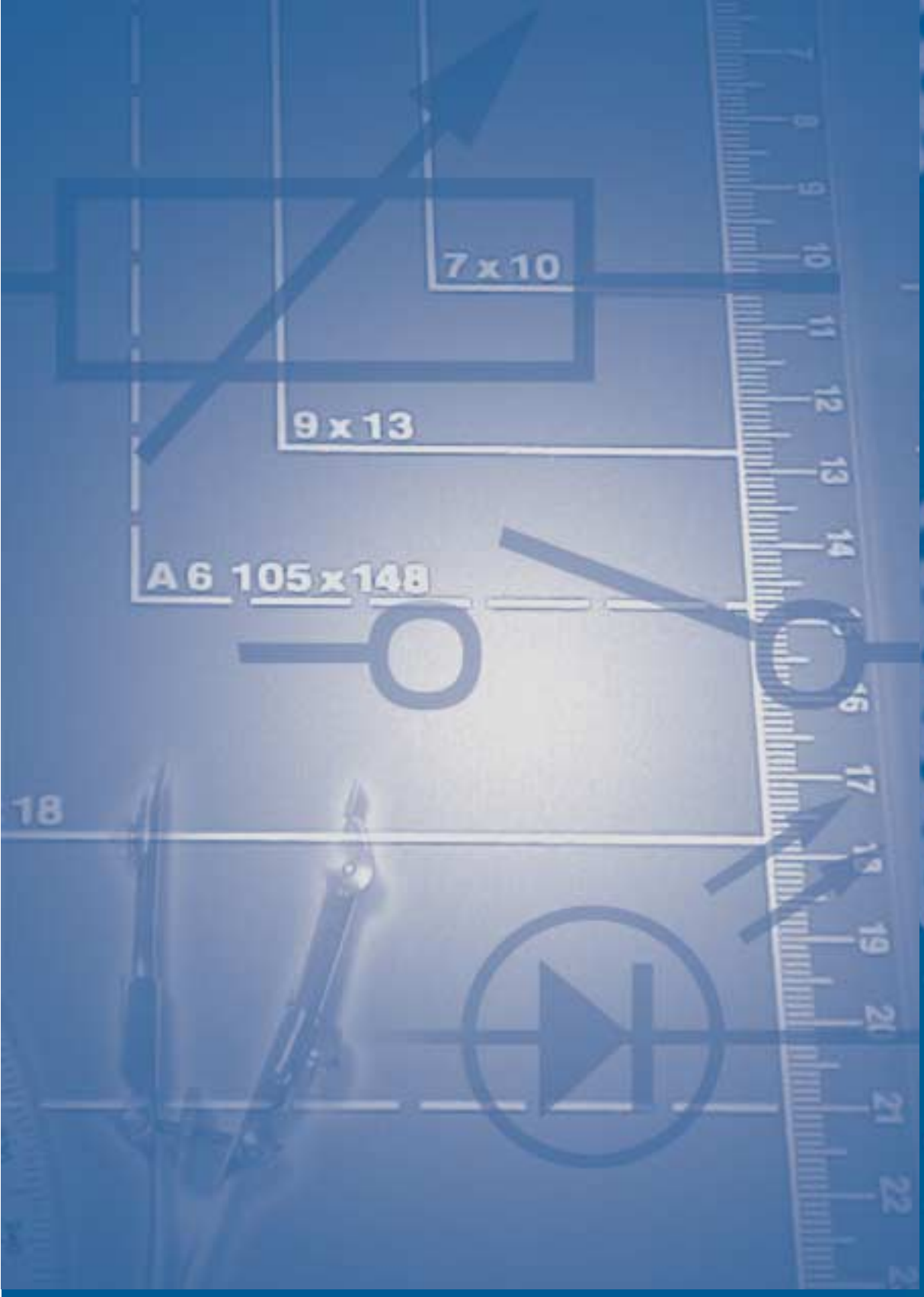

Technology

LCA
LEAVING CERTIFICATE APPLIED
ARDTEISTIMÉIREACHT FHEIDHMEACH

TECHNOLOGY

TOPICS IN COMMON

COURSE	Career	Consumer Education	Design	Electricity/Electronics	Environment	Graphic Communications	Health	House & Home	Materials	Measurements	Pricing/Costing	Public Services/Amenities
Vocational Preparation & Guidance	■	■			■						■	
English & Communications												
Mathematical Applications		■	■			■		■		■	■	
Social Education		■			■		■	■				■
Active Leisure Studies					■		■			■		
Agriculture/Horticulture		■			■		■	■		■		■
Childcare/Community Care		■	■				■	■		■	■	■
Graphics & Construction Studies		■	■	■	■	■		■	■	■	■	■
Craft & Design		■	■			■		■	■	■		
Engineering		■	■	■		■		■	■	■	■	■
Hair & Beauty		■	■				■					
Hotel Catering & Tourism		■					■	■		■	■	
Information & Communication Technology			■			■						
Office Administration & Customer Care		■									■	
Gaeilge												
Arts - Visual-Drama-Music & Dance			■			■						
Introduction to Information & Communications Technology						■						
Leisure & Recreation					■		■					
Modern Language												
Religious Education					■							
Science		■		■	■	■	■	■	■	■		■
Sign Language												

VOCATIONAL EDUCATION

TECHNOLOGY

CONTENTS

MODULE 4

INTRODUCTION

RATIONALE

This vocational specialism facilitates the personal development of learners in a number of ways. It is grounded in the life experience of the learners. It provides opportunities to develop a range of practical and generic skills normally associated with the study of technology. It enables learners to engage with the local community as learners and contributors and to express themselves using a range of graphical and other communication skills. The course seeks to engage the learners in considering and experiencing the aesthetic, safety, environmental, vocational and consumer awareness aspects of technology.

NUMBER AND SEQUENCE OF MODULES

Four modules are available in this specialism. The module "Introducing Technology" is a core mandatory module and must be taken first. The other three modules may be taken in any order.

Module 1: Introducing Technology

Module 2: Design and Manufacture

Module 3: Water Technology

Module 4: Electrical understanding and Basic Electronics

DESCRIPTION OF MODULES

INTRODUCING TECHNOLOGY

The purpose of this module is to introduce learners to the concepts, skills and processes that define technology. The module anticipates the other modules in the course by offering the learners the opportunity to practice a range of skills relevant to the other modules and by familiarising them with design methods and problem solving approaches characteristic of technology.

DESIGN AND MANUFACTURE

This module is designed to facilitate the learner in building on the skills developed in the module "Introducing Technology". Learners can design, plan manufacture and evaluate any appropriate product related to a wide range of contexts.

WATER TECHNOLOGY

This module is intended to enable the learners to develop a basic understanding of some of the characteristics of water and of how it can be controlled and used for everyday purposes. Learners practise a range of practical plumbing and engineering skills with a view to providing them with a better insight into the practical and environmental aspects of the supply, generation and distribution of water and to lead them to develop simple water systems using pumps.

ELECTRICAL UNDERSTANDING AND BASIC ELECTRONICS

This module offers to beginners and to those who have some previous experience the opportunity to design and construct basic and other electronic circuits and to perform simple electrical work relevant to the home. The module seeks to create an awareness of the production and local distribution of electricity. There is an emphasis on safety throughout the module.

MODULE 1

INTRODUCING TECHNOLOGY

MODULE 1:

INTRODUCING TECHNOLOGY

PURPOSE

The purpose of this module is to introduce learners to the concepts, skills and processes that define technology and to provide it with an identity as a course in its own right within the Leaving Certificate Applied. This module addresses and anticipates the basic skills and processes which characterise the other three modules in the course. While the learners should complete this module ahead of any of the others, it is important that learners be aware of the extent to which it is linked to and based on the other modules.

In the overall technology course learners are expected to carry out research on a range of materials and on design solutions; to practise the skills of sketching, measurement, planning, design, decision making, problem solving, manufacture, materials analysis, tool usage and evaluation. This module is intended to introduce them to all of these activities. Particular emphasis is placed on the issue of health and safety. In the context of Leaving Certificate Applied it is important that learners are facilitated and encouraged to consider the vocational aspects of technology.

PREREQUISITES

None.

AIMS

To enable the learner to:

- develop basic skills in the use of a range of materials, tools and processes relevant to the remaining modules
- develop a basic awareness of measurement, accuracy, space, capacity and weight
- develop an awareness of the properties of materials likely to be used in other modules of the course
- develop greater visual awareness and creativity
- develop ability in graphical communication to be applied in other modules
- design, manufacture, sketch and investigate the properties of simple small artefacts as an individual or as part of a group
- follow safe working procedures
- acquire transferable skills relevant to work and leisure in a changing technological society
- improve their literacy and writing skills
- pursue a more enriched work experience by establishing links between the world of work and the module
- conduct science experiments and mathematical explorations relevant to this and later modules

UNITS

The units of the module should be intermixed and sequenced as suits the requirements of the learners.

A number of small appropriate products or artefacts should be made in the course of the module to aid the teaching of or to incorporate areas such as sketching, drawing, design, research, measurement, tool usage, etc.

Unit 1: Drawing and Sketching

Unit 2: Research on materials and equipment

Unit 3: Health and safety

Unit 4: Measurement

Unit 5: Design

Unit 6: Tools, Equipment and Processes

Unit 7: Survey of local industry and local expertise

Unit 8: Project Presentation

GENERAL TEACHER GUIDELINES

TEACHING APPROACH

Specific learning programmes are not prescribed in this module descriptor. Schools /centres are free to design their own courses based on the desired learning outcomes, and are encouraged to develop and draw on a wide variety of available resources and outside experts. In addition to the exercises described in this module descriptor, the teacher/trainer should select materials and exercises that are beneficial to and suitable for the learner. Participants who are expected to do exceptionally well should be encouraged over the duration of the course to select their own activities.

A learner-centred, activity-based teaching approach should be adopted throughout.

This implies the involvement of the learner in activities such as planning, investigating, designing, researching, problem solving, getting things done, acquiring knowledge, organising, reflecting, drawing conclusions. These activities are best organised by use of the following techniques: brainstorming, pro forma worksheets, individual and/or group research, structured group work, case studies, careers-teacher input, use of library, activities in real or simulated situations, visitor exercise, visits outside the school or centre.

It is necessary for learners to develop concept word banks related to the module to help them improve their literacy skills. The module should be regarded as a means of enabling learners to improve their writing skills.

Theoretical and practical work should be combined throughout this module. Long theory sessions should be avoided. Every opportunity should be taken to encourage the learners to utilise their existing skills, and to develop new practical skills as well as skills in communication, and interpersonal relationships.

Many of the desired learning outcomes listed in Section 5 are related to problem-solving exercises that facilitate active learning on the part of the learner. It is necessary that the teacher/trainer provide guidance and suggestions on the exercises undertaken and that the teacher/trainer actively helps learners to interpret their findings and to prepare their evaluation reports.

It is on the basis of the desired learning outcomes in Section 5 that evidence for satisfactory completion of the module is generated. Staff and learners should consider drawing up pro forma activity and record sheets to provide learners with a clear focus for their research and other activities, and to record their findings.

Unit 1: Drawing and Sketching

LEARNING OUTCOMES

The learner will be able to:

1. draw/trace/sketch simple sketches using grid paper
2. identify basic shapes, e.g. triangles, quadrilaterals, polygons, and draw/trace these shapes using templates or instruments
3. create three-dimensional drawings of simple objects relevant to this and other modules in the course
4. dimension drawings and sketches
5. create scale drawings of simple objects relevant to this and other modules
6. enlarge or reduce drawings

TEACHER GUIDELINES

Note: All of the exercises should be relevant to the remaining modules in the course

- Learners may be encouraged to sketch simple objects with the aid of grid paper. Some learners may start by tracing sketches in order to increase their confidence.
- Basic shapes cut from a solid material if presented to the learners will help to illustrate their properties and when combined can be used to illustrate and create new shapes and patterns.
- Learners whose skill levels are low need special help to identify the direction of the lines in oblique views. Concentrate on straight lines at first and then introduce simple curves.
- Drawings may be enlarged or reduced by using methods such as grids, photocopier, overhead projector, and computer graphics applications.
- The learners may compile a small portfolio of sketches to illustrate examples of their best work.
- Learners may identify relevant drawings/sketches areas from work placements or from the environment.
- They may also choose to create their own for a specified situation.

Unit 1: Drawing and Sketching (Continued)

LEARNING OUTCOMES

7. appreciate the importance of graphics in the production of any artefact
8. create simple orthographic projection drawings of appropriate items.

TEACHER GUIDELINES

- Where it is possible students work (both graphic and practical) should be displayed, even for a short period of time.
- These may be done using instruments or using freehand sketching

Unit 2: Research on materials and equipment

LEARNING OUTCOMES

The Learner will be able to:

1. carry out and record the findings of scientific tests on a range of materials deemed suitable for constructing a small artefact, and/or related to some other module in the course
2. record technical information related to the characteristics and maintenance of four tools
3. investigate methods of handling waste and of recycling by-products of the manufacturing process
4. carry out at least one mathematical exploration relevant to the module.

TEACHER GUIDELINES

- Scientific experimentation carried out on materials deemed suitable for use in constructing artefacts should have the following characteristics:
  - be relevant to the range of materials considered
  - be relevant to the small product manufacture outlined in Units 5 and 6
  - anticipate the types of work to be completed in the remaining modules
  - be valid scientific experiments
  - be carried out using controls and standardised condition
  - where possible produce quantitative results which can be recorded in tabulated and/or graph form
  - ideally, they should enable the students to make informed choices as to the most suitable materials for use in the manufacture of artefacts.
- Possible scientific experiments may include:
  - experiments related to the most suitable materials for the artefact

Unit 2: Research on materials and equipment (Continued)

LEARNING OUTCOMES

TEACHER GUIDELINES

- experiments using pressure, mass, tension etc. to test the most suitable joining methods for materials
- experiments related to prolonging durability, life-cycle and appearance of the materials under a range of environmental conditions
- investigations into the possible effects on the artefact of damage to the material used, e.g. warping, scratching, corrosion, scorching, etc.
- investigations to test the effectiveness of remedial action taken to repair damage
- investigations into the effectiveness of protective coverings on proprietary materials, e.g. galvanised layers.

This unit may be linked to the Science course in Leaving Certificate Applied

Unit 3: Health and safety

LEARNING OUTCOMES

The learner will be able to :

1. identify commonplace potential hazards from materials, tools and equipment
2. outline emergency procedures to shut down equipment in cases of malfunction
3. outline procedures for summoning assistance in case of accident
4. outline key regulatory requirements in relation to the workplace
5. identify correct means of lifting and handling objects.

TEACHER GUIDELINES

- Case study material will facilitate greater understanding of the health and safety aspects of the module.

- The learners should be introduced to the publications from the National Industrial Safety Organisations in particular Construction Summary Sheet No. 8 "Portable Electric Tools and Equipment".
- Along with the hands on awareness and appreciation of good working practice in the workshop, learners should be encouraged to look critically at safety in their own home and beyond, to public places and industrial environments.

  This exercise presents an opportunity to link with the course in Vocational Preparation and Guidance.

Unit 4: Measurement

LEARNING OUTCOMES

The learner will be able to:

1. carry out practical exercises in accurate measurement as follows:
   - measuring distances on solids and on paper
   - measuring volumes
   - measuring voltage, current and resistance in electricity
   - measuring weights
   - carrying out costings
   - measuring air pressure
   - taking temperature readings
   - carrying out geometric measurements (angles, etc)
   - mark out materials as relevant
2. practise making estimates
3. record measurements carried out
4. insert measurements on drawings or sketches where appropriate
5. develop an awareness of the necessity to repeat measurements in some instances.

TEACHER GUIDELINES

The measurement exercises listed here should be relevant to all of the other three modules in the course and to the small product manufacture contained in Units 5 and 6.

- In some areas such as temperature, volume, weights, the learners should be encouraged to repeat measurements to become aware of the usefulness of averaging repeated measurements of the same item.
- If appropriate to the work envisaged in other modules, appropriate measurement of sound, acidity etc should be carried out.
- Learners must use tables or other methods to record and communicate the measurements carried out.
- Repeat measuring refers to measuring twice before cutting to guarantee accuracy, or repeating scientific tests to ensure more accurate outcomes.

These exercises may be linked to courses in Mathematical Applications, Science.

Unit 5: Design

LEARNING OUTCOMES

The learner will be able to :

1. evaluate existing designs
2. suggest or make modifications to simple existing designs
3. identify examples of good or poor design in relation to safety
4. compare and contrast different designs in terms of colour, alternative materials, value for money
5. become aware of the influence on design of individual taste and cultural differences
6. use the exercises above along with an appropriate design process to design any simple product
7. draw up a simple design portfolio to accompany any practical work. This should include sketches, notes and an evaluation.

TEACHER GUIDELINES

At least three topic areas from the module entitled "*Design and Manufacture*" should be selected for these exercises. Examples from the local environment should be considered also.

- A wide range of examples, approaches, resources, slides, magazines, outdoor visits should be used to enable the learners to discuss the quality of design. There may be opportunities to take existing items apart to examine designs or to focus on the methods used to combine desired appearance with desired function.
- It may be helpful to use work cards with headings such as suitability for purpose, appearance, safety, value for money, business potential, etc.
- As part of an appropriate design process learners should:
  - formulate and record a design brief which sets out the purpose and context of the manufactured artefact.
  - conduct simple exercises relevant to design work such as research related to materials, processes, finishes, required tools and machinery, evaluation etc.

Unit 5: Design (Continued)

LEARNING OUTCOMES	TEACHER GUIDELINES
	• a questionnaire with six or seven questions may be used to help the learner carry out the evaluation. ▶ The use of proforma work cards to develop this portfolio should be considered. ***This unit presents an opportunity to link with the course in Visual Art if it is being implemented.***

Unit 6: Tools, Equipment and Processes

LEARNING OUTCOMES

The learner will be able to:

1. identify and name tools and equipment required for given processes
2. sketch and name the parts of tools and equipment as appropriate
3. reach an acceptable level off skill relevant to the use of these
4. examine, practise and explain suitable manufacturing processes, methods of assembly, finishing treatments, and storage of work in progress
5. develop a vocabulary relevant to the module
6. make simple products in conjunction with the previous units, especially in relation to Unit 5.

TEACHER GUIDELINES

- Reference should be made to the other three modules to decide on the range of tools and equipment to be addressed.
- Learners should use work cards for any exercise involving naming or recording.
- A visit to an appropriate factory or to a tools/equipment shop will provide useful subject matter for this unit.
- Learning centres are of particular use in this unit.
- The work of the unit will be significantly enhanced if an invited visitor demonstrates skills.
- A number of different products or artefacts may be made in the course of the unit to aid or incorporate sketching, drawing, research, measurement, tool usage, etc.

Unit 7: Survey of relevant local industry and local expertise

LEARNING OUTCOMES

The learner will be able to:

1. compile a list of local workplaces and craftspeople relevant to the module
2. investigate the possibility of doing work experience in these workplaces
3. research the opportunity of training in one skill
4. describe the safety, health and hygiene procedures used in the workplace.

TEACHER GUIDELINES

- This unit serves as an introduction to similar units in future modules, and as such should be addressed in a simple fashion.

  There is an obvious link between this unit and the course in Vocational Preparation and Guidance and some of the work may be carried out as part of that course.

Unit 8: Project Presentation

LEARNING OUTCOMES

1. At the end of the module the learners, working independently of other learners and with the assistance of the teacher, should present a reflective folder
   - listing the skills and procedures learned during the module
   - identifying their own contribution to the module as well as that of peers, staff and other adults
   - identifying reasons for elements of success or failure during the module
   - Identifying simple targets in relation to skills or approaches which are not yet working well
   - describing how their thinking has changed (if applicable) in relation to any feature of life as a result of doing the module including any change of understanding of the notion of technology
   - describing a scientific test carried out on materials used and research on existing artefacts (units 2,5)
   - including recorded material showing an awareness of the necessity to follow safe working procedures (unit 3)
   - containing a survey of the types of existing local industry and of the local expertise available relevant to the module (unit 7).

TEACHER GUIDELINES

- This unit involves no new work. It serves to draw the units together over the duration of the module and helps the learner to perceive the module as a unified piece of work.

RESOURCES

A range of Craft, Design and Technology text books such as:

Design and Realisation by C. Chapman, M. Peace 1988.
Published by Collins Educational.

Integrated Craft and Design by C. Caborn, I. Mould 1981.
Published by Harrap Books.

CDT Projects and Approaches by D. Barlex, R. Kimbell 1986.
Published by Macmillan Education.

The Creative Use of Concrete, Schools Council Design
and Craft Education Project. 1968.

Candlemaking Creative Designs and Techniques. ISBN O 85532 6832.

Textbooks on subjects such as:

- Art craft and design;
- Construction studies;
- Engineering;
- Home economics.

Starting Design and Communication by Brian Light, Longman,
ISBN 0-582-00429-2.

Design Illustration by David Beasley, Heinemann Educational Books,
ISBN 0-435-75063-1

DIY books such as those published by the Readers Digest
Magazines related to:

- Home maintenance;
- Home crafts;
- Human resources in the local community.
- Course material on Leaving Certificate Applied courses in the Vocational Specialisms Construction/Manufacturing, Engineering, Horticulture/Hotel Catering and Tourism/Craft and Design, Information Technology, Mathematical Applications, Vocational Preparation and Guidance.

KEY ASSIGNMENTS

MODULE 1: **INTRODUCING TECHNOLOGY**

CHECKLIST

I designed and made a _____

out of _____ for _____. ☐

As part of a group I carried out scientific tests on the material/s we used. ☐

I completed a report on one out of school experience listing:

- what was learned
- skills developed
- further skills to be developed or improved upon. ☐

I produced a reflective folder to show the range of learning I experienced while doing the module. ☐

MODULE 2

DESIGN AND MANUFACTURE MODULE

MODULE 2:

DESIGN AND MANUFACTURE MODULE

PURPOSE

The purpose of this module is to give learners the opportunity to build on the learning achieved in module 1: Introducing Technology. It will enable them to upgrade their skills by using the design process to plan, manufacture and evaluate an appropriate product of their choice. The product could relate to areas such as storage, casting and moulding technology, stagecraft, transport.

On completion of an appropriate amount of investigation and reflection, learners should select a product related to one area, such as those outlined above. They should design and manufacture it using an approach characteristic of the study of technology including activities such as creating a design brief, planning, research, decision making, materials processing, skills development, problem solving, manufacturing and evaluation.

PREREQUISITES

Module 1: Introducing Technology.

AIMS

To enable the learner to:

- develop further the learning achieved in the module "Introducing Technology"
- improve their skills in the use of a range of materials and tools
- develop a increased awareness of measurement, accuracy, space, capacity and weight, texture and of the properties of materials
- conduct more advanced science experiments and mathematical explorations relevant to the module
- develop greater visual awareness and creativity
- develop their skills in applying graphical communication techniques
- design and make products as part of a group or as an individual
- follow safe working procedures
- acquire transferable skills relevant to work and leisure in a changing technological society
- pursue a more enriched work experience by establishing links between the world of work and the module.

UNITS

The units of the module should be intermixed and sequenced as suits the requirements of the learners. Unit 6 is optional.

Unit 1: Research on materials, existing products, tools and processes

Unit 2: Design brief and design solutions

Unit 3: Design realisation: Make product to specification using appropriate materials

Unit 4: Health and safety

Unit 5: Evaluation and testing of the product and of the process followed

Unit 6: Survey of relevant existing local industry and of available local expertise

Unit 7: Project presentation

Unit 1: Research on materials, existing products, tools and processes

LEARNING OUTCOMES

The learner should be able to:

1. collect, display and record pictures and/or drawings of existing examples of products from the areas set out under "PURPOSE" above
2. collect, display and record a range of materials which may be used to make the products
3. carry out and record the findings of scientific tests on materials deemed suitable for making the product
4. record technical information related to the characteristics and maintenance of four pieces of equipment or tools
5. investigate methods of handling waste and of recycling by-products of the manufacturing process
6. carry out at least one mathematical exploration relevant to the module
7. identify the tools/equipment/materials required for given processes
8. examine and practise suitable manufacturing processes, methods of assembly and finishing treatments
9. identify basic ergonomic considerations relevant to the product
10. develop a vocabulary relevant to the module.

TEACHER GUIDELINES

- Learner should use magazines, books, videos, internet, products on sale in shops to generate design ideas. They should be encouraged to be as imaginative and creative as possible at first. If necessary they should then simplify their designs in accordance with their level of skills and the processes and materials available.
- Scientific experimentation carried out on materials deemed suitable for manufacturing products should have the following characteristics:
  - be relevant to the range of materials considered
  - be valid scientific experiments
  - be carried out using controls and standardised conditions
  - produce informative results in relation to Units 2 and 3
  - where possible produce quantitative results which can be recorded in tabulated and/or graph form
  - ideally, they should enable the learners to make informed choices as to the most suitable materials for use in the manufacture of the product they are interested in.

Unit 1: Research on materials, existing products, tools and processes (Continued)

LEARNING OUTCOMES

TEACHER GUIDELINES

▶ Possible scientific experiments may include:

- experiments related to the most suitable materials for the product
- experiments using pressure, mass, tension etc. to test the most suitable joining methods for materials
- experiments related to prolonging durability, life-cycle and appearance of the materials (and hence of the products) under a range of environmental conditions
- investigations into the possible effects on the product of damage to the material used, e.g. warping, scratching, corrosion, scorching, decay etc.
- investigations to test the effectiveness of remedial action taken to repair damage
- investigations into the effectiveness of protective procedures on proprietary materials.

Unit 1: Research on materials, existing products, tools and processes (Continued)

LEARNING OUTCOMES

TEACHER GUIDELINES

- Possible mathematical explorations include:
  - mathematical exercises related to the topic of area
  - computing the amounts of materials required
  - maximising the use of materials by planning the most efficient usage patterns
  - Mathematical exercises related to costs of materials
  - costing parts/ingredients/materials and cutting lists
  - cost comparisons between materials
  - manufacturing cost to the learner compared with buying the product in a shop (the latter may be the less expensive).

This unit presents the opportunity to link with other courses such as Mathematical Applications, Science, and other specialisms.

Unit 2: Design brief and design solutions

LEARNING OUTCOMES

The learners should be able to:

1. name the product he or she wishes to make and state its purpose
2. formulate and record a design brief which sets out the purpose and context of the manufactured product
3. investigate possible solutions
4. set down the criteria for the selection of a particular solution including the maximum overall dimensions/extent of the product
5. adapt an existing design or draw up a new design for the product
6. develop and use good standards in sketching, drawing and practical skills
7. measure materials accurately
8. identify additional structural, constitutive, decorative or other features where appropriate to complement the overall design
9. include mechanical, electronic or computer-aided elements into the design where appropriate
10. produce a working drawing, sketch or outline of the project, showing an adequate number of dimensions or indications of the extent of it
11. draw up a suitable parts/ingredients/ materials list and/or a cutting list.

TEACHER GUIDELINES

- The design brief is a simple statement of purpose and context for the product, e.g. "to design and make a……
  to …… (purpose)
  for/in a……..(context)"
- A worksheet with headings reflecting the points in the adjoining column will help the learners to focus on the exercises to be carried out.
- Two's and four's exercises are a useful aid to enable groups to select a group project.
- The specific instruction in the necessary practical, measuring and drawing and sketching should carry on from that done in Module 1. Ample time should be spent developing a basic proficiency in all skills. Exercises in planning and drawing should form a continuous part of the learners' work throughout the module.
- Experts from outside the school or centre should be used or visits to workplaces or shops organised.
- Learning stations are a suitable way of dealing with content related to tools and equipment.

Unit 3: Design realisation: Make a product to specification using appropriate materials

LEARNING OUTCOMES

The learners should be able to:

1. make the product to specification using appropriate processes, methods of assembly and finishing treatments
2. keep accurate written and graphical records of progress
3. produce photographs to record progress at three stages of the project
4. produce a finished accurate drawing/description of the product.

TEACHER GUIDELINES

- For the purposes of this module, satisfactory completion in all cases requires that the final product is a stand alone completed entity, where no further fabrication or manufacture is necessary.
- Keeping graphical and written records provides an opportunity for the learners to develop their literacy skills and to develop a relevant list of key words and concepts.

Unit 4: Health and safety

LEARNING OUTCOMES

The learner will be able to :

1. identify commonplace potential hazards from materials, tools and equipment
2. outline emergency procedures to shut down equipment in cases of malfunction
3. outline procedures for summoning assistance in case of accident
4. outline key regulatory requirements in relation to the workplace
5. identify correct means of lifting and handling objects.

TEACHER GUIDELINES

- Case study material will facilitate greater understanding of the health and safety aspects of the module.
- The learners should be introduced to the relevant publications from the National Industrial Safety Organisations.
- Along with the hands on awareness and appreciation of good working practice in the workshop, learners should be encouraged to look critically at safety in their own home and beyond to public places and industrial environments.
- Given the ever growing nature of safety legislation it is useful to invite an expert as a visitor to the classroom to deal with specific safety issues.

This exercise presents an opportunity to link with the course in Vocational Preparation and Guidance.

Unit 5: Evaluation and testing of the product and of the process followed

LEARNING OUTCOMES

The learners should be able to:

1. test the product to see if it realises the aims of the design brief and record the results
2. list the skills and procedures learned from doing the project
3. identify reasons for elements of success or failure in the project
4. suggest how the project might be improved upon
5. identify his or her own contribution to the project (group project), as well as that of teachers and of other adults
6. identify simple targets in relation to skills or approaches which need improvement
7. describe how their thinking has changed (if applicable) in relation to any feature of life as a result of doing the module including any change of understanding of the notion of technology.

TEACHER GUIDELINES

- This unit serves as both an evaluation exercise and a reflective exercise. It is useful to use proforma workcards to facilitate this exercise.
- Given the reluctance of some learners to articulate significant evaluations or reflections it is advisable to make use of methods such as word banks, picture selection exercises.

There is an obvious link between this unit and the exercise in personal reflection. The reflection carried out here may feed into the final Reflective Statement

Unit 6: Survey of relevant local industry and available local expertise (Optional)

LEARNING OUTCOMES

The learners should be able to:

1. compile a list of local workplaces and craftspeople relevant to the module
2. investigate the possibility of doing work experience in these workplaces
3. identify the skills and duties of shopfloor employees in a particular workplace
4. research the opportunities for training in those skills
5. identify quality control methods used in the workplace
6. describe the safety, health and hygiene procedures used in the workplace
7. research the impact of changing technology on employment in a particular workplace.

TEACHER GUIDELINES

- This is an exercise which builds and adds to a similar exercise in Module 1.
- ***There is an obvious link between this unit and the course in Vocational Preparation and Guidance and some of the work may be carried out as part of that course.***
- Learners may be encouraged to seek work experience in an area related to this module.
- Using visitors is an obvious activity to use in this unit.

Unit 7: Project Presentation

LEARNING OUTCOMES

The learners will be able to:

1. present the completed project for inspection
2. working independently of other learners, and with the assistance of the teacher, present a folder containing the following:
   - brief scientific test carried out on materials used and research on existing products (unit 1);
   - the design folder (unit 2);
   - survey of the types of existing local industry and of the local expertise available relevant to the module (unit 6);
   - a written, graphical and photographic account of the production process carried out and of the product produced (unit 3);
   - the evaluation of the process and product (unit 5).

TEACHER GUIDELINES

- This unit involves no new work but serves to draw the whole module together and to help the learner perceive it as a unified piece of work.

RESOURCES

A range of useful resources for this module exist.
They include the following:

Textbooks on subjects such as:

- Art craft and design;
- Construction studies;
- Engineering;
- Home economics;
- Stagecraft

DIY books such as those published by the
Readers Digest Magazines related to:

- Home maintenance;
- Home crafts;
- Human resources in the local community.
- Winemaking

Materials relating to Leaving Certificate Applied courses the Vocational Specialisms (Construction/Manufacturing, Engineering, Horticulture, Information Technology, Craft and Design, Hotel Catering and Tourism) Mathematical Applications, Science, Vocational Preparation and Guidance.

KEY ASSIGNMENTS

MODULE 2: **DESIGN AND MANUFACTURE MODULE**

CHECKLIST

I designed and made a _____

out of _____for _____. ☐

As part of a group I carried out scientific tests on the material/s I used. ☐

I produced a reflective folder to show what I experienced and learned in and out of school while doing the module. ☐

I made a sketch of the finished product or of a process I used, at three different points of completion. ☐

MODULE 3

WATER TECHNOLOGY

MODULE 3:

WATER TECHNOLOGY

PURPOSE

The purpose of this module is to enable learners to develop a basic understanding of some of the characteristics of water and of how it is controlled and used for different purposes. Learners are introduced to the idea of the local water supply system and to the concept of the water cycle. They practise a range of plumbing exercises and are expected to carry out scientific experiments related to water. The use of water pumps adds an extra dimension to the module and is central to a water technology project that the learners plan and construct on the basis of a design brief. The module is problem-solving oriented and is designed to engage the learner in decision-making and evaluation activities.

PREREQUISITES

Module 1: Introducing Technology.

AIMS

To enable the learner to:

- acquire a knowledge of basic water systems
- acquire skills in the use of tools, fixtures and fittings used in plumbing
- identify and select appropriate fittings and materials for particular water technology exercises
- conduct scientific experiments related to water
- follow safe working procedures
- acquire transferable skills relevant to work and leisure in a changing technological society.

UNITS

The units of the module should be intermixed and sequenced as suits the requirements of the learners.

Unit 1: Understanding the local water supply system

Unit 2: Understanding basic hot/cold water systems

Unit 3: Plumbing exercises

Unit 4: Water disposal systems

Unit 5: Scientific tests

Unit 6: Pumps

Unit 7: Water technology project

Unit 8: Evaluation of the project and of the learner's learning experiences in the module

Unit 9: Project presentation

Unit 1: Understanding the local water supply system

LEARNING OUTCOMES

The learner will be able to:

1. describe the water cycle in terms of transpiration, evaporation, condensation, precipitation
2. describe the local mains water supply system in terms of reservoirs, pressure, water towers, and water purification
3. identify the authority responsible for the water supply, the address of its main office, the rate of water charges, the method of measuring water consumption, the methods of collecting water charges
4. draw a local map to identify the routes which the water supply follows to reach his/her locality.

TEACHER GUIDELINES

- Combine instruction and research based on Junior Certificate science textbook drawings and materials.
- Visitor exercise.
- Visit to Local Authority Office.
- Map reading.
- Map drawing.
- Study of basic science texts.

Unit 2: Understanding basic hot/cold water systems

LEARNING OUTCOMES

The learner will be able to:

1. describe the location and direction of the rising main, and the connections leading to and from it, using pro forma drawings
2. describe the flow of domestic hot and cold water using pro forma drawings
3. identify the principal features in the system on pro forma drawings
4. locate and make sketches of the high and low pressure control fittings in the overall system
5. become aware of the relevance of the high level of the cold water tank to the creation of the pressure to all taps
6. identify and describe safety features in the system
5. describe two purposes of insulation
6. distinguish between different forms of insulation
7. identify the parts of the home plumbing system that need to be insulated
8. perform insulating tasks using two types of insulating techniques
9. describe ways of preventing unnecessary loss of heat in domestic hot water systems.

TEACHER GUIDELINES

- Pro forma drawings may be supplied from simple diagrammatic drawings of domestic plumbing systems commonly found in books on plumbing or in The Reader's Digest DIY manuals. Remove labels and names for the purposes of this unit.
- Learners should distinguish between stop valves, gate valves and drain valves. High pressure stop valves will be placed at the kitchen sink, or underground by the road side by the local authority. Low pressure stop valves are placed on pipes leading from the storage tank.
- The principal features should include stop valves, gate valves, drain valves, storage tank, ball-valve, overflow pipe, hot water cylinder, expansion pipe, boiler, rising main, expansion tank, pump, radiator.
- Simple science experiments on water pressure can be used to clarify this topic.
- Investigate selected buildings and record findings on pro forma sketches.
- The two purposes of insulation are to prevent water from freezing in pipes and to prevent unnecessary heat loss from water in a heating system.

Unit 2: Understanding basic hot/cold water systems (Continued)

LEARNING OUTCOMES

TEACHER GUIDELINES

- Insulation is necessary both within and outside the house.
- Different forms of insulation include bandage insulation, plastic foam insulation, fibre mat insulation, sheet insulation.
- Ways of preventing unnecessary loss of heat in domestic hot water systems include using a lagging jacket on the hot water cylinder, minimising hot water pipe lengths between the cylinder and hot taps, installing showers, heating water only as needed.

Unit 3: Plumbing Exercises

LEARNING OUTCOMES

The learner will be able to :

1. perform a variety of basic plumbing tasks as listed in the teacher guidelines (Unit 3) using a range of different materials
2. name the relevant fittings, parts, adhesives and tools used for each task
3. distinguish between common plumbing materials
4. define the following items of vocabulary: washer, vent, radiator, jumper, mastic, w.c. connector, waste outlet, solvent, cement, copper, hydradare, qualpex, acorn, names of tools.

TEACHER GUIDELINES

- The learners should perform the following plumbing exercises: repairing leakages, venting radiators, unblocking tasks, joining pipes of copper and of a wide range of other materials, bending copper and plastic pipes, cutting pipes to length, installing taps and ball valves, repairing dripping taps, etc.
- Demonstrations of previously completed exercises will help learners to become interested in the exercises.
- In this context, alerting learners to the contents of Unit 7 during this unit may be very beneficial.
- Exercises in joining and bending copper pipes may be combined to form pieces of sculpture or combined with other materials to form small pieces of furniture.
- The tools most commonly used in plumbing include: hacksaws, pipe cutters, pipe-bending springs, files, pipe bending machine, basin wrench, stillson pipe wrench, spanners (adjustable, open-ended), pliers (combination, slipjoint), spirit level.

Unit 4: Water disposal systems

LEARNING OUTCOMES

The learner will be able to :

1. assemble a waste pipe and trap for a kitchen sink or a hand basin or a shower
2. name the important parts of the system
3. construct a simple rain water disposal system
4. distinguish between a single stack drainage system and a two-pipe drainage system
5. show the location of the nearest sewerage and waste disposal system on a local map.

TEACHER GUIDELINES

- These exercises are best done using disused sinks or hand basins.
- Use names combined with sketches.
- Use proforma unlabelled drawings together with descriptions.

- This can be combined with work in Unit 1.

Unit 5: Scientific tests

LEARNING OUTCOMES

The learner will be able to:

1. carry out scientific experiments related to water and its uses
2. describe the methods and results of experiments carried out.

TEACHER GUIDELINES

- Scientific tests carried out should have the following characteristics:
  - be relevant to the subject matter of the module
  - be valid scientific experiments
  - be carried out using controls and standardised conditions
  - produce informative results in relation to the module
  - where possible produce quantitative results which can be recorded in tabulated and/or graph form
- Scientific experiments should include:
  - experiments to show that water finds its own level
  - experiments to show that pressure in water increases with depth
  - experiments to show sedimentation and filtration in a model of a filter bed
  - experiments to show the capillary action of water
  - experiments to show the effect of insulation
- Other experiments may include
  - experiments to examine expansion and contraction of copper pipes and of water
  - experiments in conduction, convection and radiation to examine heat loss

Unit 6: Pumps

LEARNING OUTCOMES

The learner will be able to :

1. identify on pro forma drawings the location of the pump on a central heating system
2. describe the function of the pump
3. distinguish between a pump in a heating system and cold water fountain pump
4. assemble a cold water pump according to a list of instructions
5. identify six parts of a cold water pump
6. run the pump in a tank or other water container
7. describe the function of a pump in a local installation, water fountain/cascade, if such exists.

TEACHER GUIDELINES

- The emphasis in this unit is on fountain pumps because they can be used most easily to demonstrate the function and operation of a pump.
- It is up to the teacher to decide what size of pump to use. It is suggested that two pumps are used - 5 watt and 16 watt. The latter is more suitable for assembly exercise and for identifying six parts of a cold water pump. The use of a low wattage pump makes it possible to complete the project in Unit 7 without going outside the workshop.

Unit 7: Water technology project

LEARNING OUTCOMES

The learner will be able to :

1. carry out a project which incorporates a pump and applies the knowledge and skills learned in previous units
2. formulate and write down a design brief which sets out the nature of the project
3. keep accurate and graphical records of progress
4. produce photographs to record progress at three stages of the project
5. produce a realistic sketch or accurate drawing of the finished project
6. produce a report showing the methods and processes used in completing the project.

TEACHER GUIDELINES

- This project may be done indoors or outdoors.
- The object of the project is to use the skills learned earlier in the module to combine pump and other fixtures into a simple functional unit. It is not necessary that the project be of any practical use. Simple utensils and fittings should be used.
- Each project should be constructed so that the pump can be detached easily. In this way the same pump can be used for several projects.
- The following are examples of projects which may be undertaken
  - simple fountains and cascades
  - roof drainage model
  - models of double garden ponds
  - indoor fountains based on pottery/ceramics
  - projects using plastic seep piping.
- Learners should explore different ideas using brainstorming. If there are group projects, twos and fours exercises may be used to decide on the project selected.

Unit 8: Evaluation of the project and of the learner's learning experiences in the module

LEARNING OUTCOMES

The learner will be able to:

1. test the product completed in Unit 7 to see if it realises the aims of the design brief, and record the results
2. list the skills and procedures learned from doing the project and the other exercises in the module
3. identify reasons for elements of success or failure in the project
4. suggest how the learning experiences of the module might be improved upon
5. where applicable, suggest how the project may be changed or added to in order to fulfil some other purpose
6. identify his or her own contribution to the project (group project), as well as that of teachers and of other adults
7. describe how their thinking has changed (if applicable) in relation to any feature of life as a result of doing the module including any change of understanding of the notion of technology.

TEACHER GUIDELINES

- This unit serves as both an evaluation exercise and a reflective exercise. It is useful to use proforma workcards to facilitate this exercise.
- Given the reluctance of some learners to articulate significant evaluations or reflections it is advisable to make use of methods such as word banks, picture selection exercises, etc. to stimulate this unit.

There is an obvious link between this unit and the exercise in personal reflection. The reflection carried out here may feed into the final Reflective Statement.

Unit 9: Project Presentation

LEARNING OUTCOMES

The learner will be able to:

1. present the completed project and a selected number of other exercises for inspection
2. working independently of other learners, and with the assistance of the teacher, present a folder containing the following:
   - results of a survey on the local water supply system (unit 1)
   - reports of scientific tests carried out (Unit 5)
   - accounts of practical exercises carried out (Units 3, and 4)
   - a report, including graphical and photographic material, of the production process carried out and of the completed Water Technology Project (Unit 7)
   - the evaluation exercise (Unit 8).

TEACHER GUIDELINES

- This unit involves no new work but serves to draw the whole module together and to help the learner perceive it as a unified piece of work.

RESOURCES

Living Water: Home and Garden Water Technology, the OASE Catalogue. Available from Fountains and Decor Limited, Brownstown House, Kingswood Cross, Naas Road, Clondalkin, Dublin 22. Tel. 01 - 592205, 592284, 591724

The Complete Home Plumber edited by Mike Lawrence, Little and Brown Publishing Company

Reader's Digest DIY Manual

Leaving Certificate Building Construction/Engineering Text Books

Junior Certificate Science Textbooks

KEY ASSIGNMENTS

MODULE 3: **WATER TECHNOLOGY**

CHECKLIST

On a given drawing, I named six very important parts of the water flow system in a house. ☐

I completed a water technology project using a pump and other plumbing fittings. ☐

As part of a group, I carried out two scientific experiments related to water technology. ☐

I completed a report on one out of school experience listing:

- what was learned
- skills developed
- further skills to be developed or improved upon. ☐

MODULE 4

ELECTRICAL UNDERSTANDING AND BASIC ELECTRONICS

MODULE 4:

ELECTRICAL UNDERSTANDING AND BASIC ELECTRONICS

PURPOSE

The purpose of this module is to enable learners to develop a basic understanding of electricity and electronics and to develop an awareness of safety in the use of electricity in the home. Learners are introduced to the idea of electric circuits and are given the opportunity to plan and assemble electric circuits on the basis of a design brief. Learners are expected to carry out scientific experiments related to electricity. The module is problem-solving oriented and is designed to engage the learner in decision-making and evaluation activities.

PREREQUISITES

Module 1: Introducing Technology.

AIMS

To enable the learner to:

- acquire a basic subject knowledge of electricity and electronics
- design basic electronic circuits and carry out basic electrical wiring exercises
- conduct science experiments related to electricity
- follow safe working procedures
- acquire skills in the use of tools associated with electricity and electronics
- acquire transferable skills relevant to work and leisure in a changing technological society
- carry out work experience assignments related to the use of electricity and electronics.

UNITS

The subject matter set out in the modules may be taken in any order to suit the requirements of the learners

Unit 1: Electricity in the home

Unit 2: Introductory electronic circuits

Unit 3: Basic electronic circuits

Unit 4: Scientific experiments

Unit 5: Health and safety

Unit 6: The local electricity supply

Unit 7: Evaluation of learner experiences in the module

Unit 8: Presentation of evidence of work completed in the module

Unit 1: Electricity in the home

LEARNING OUTCOMES

The learner will be able to:

1. wire a 3-pin plug
2. draw sketches of the wired plug
3. design and make an extension cable for indoor or outdoor use
4. identify the tools commonly used by electricians
5. describe the safety features of the plug
6. distinguish between insulators and conductors
7. distinguish between the neutral earth and live wires
8. describe the functions of each in the context of domestic wiring
9. develop some awareness of the extent to which electronic components form part of household appliances
10. describe the function of the switch
11. describe the function of the fuse and the applications of different fuse sizes available commercially
12. describe the relationship between the live wire on the one hand, to both the fuse (circuit breaker) and switch.

TEACHER GUIDELINES

- The amount of plugs, sockets, and tools available should be sufficient to enable each learner to participate meaningfully in the practical work relevant to this unit.
- Theory can be addresses by combining practical work, direct instruction, and investigations based on prepared materials or models.
- Use an experiment from Unit 3 to investigate insulating and conducting materials.
- In distinguishing between the neutral, earth and live wires in the context of domestic wiring, it is necessary that the learners know the following:
  - the colour of each wire
  - that the live and neutral wires carry electricity
  - the live carries current into the house
  - the neutral carries the current out
  - the live and neutral pins in a plug must connect to the live and neutral wires respectively in the circuit
  - the earth is connected to the ground and
  - the earth pin in a plug is connected to this.

Unit 1: Electricity in the home (Continued)

LEARNING OUTCOMES

TEACHER GUIDELINES

- Learners attention may be drawn to a range of components such as transistors, transducers, thermistors, timers, water level detectors, LEDs, LDRs, relays, switches, electric motors, integrated circuits.
- In terms of the relationship between both the fuse and switch to the live wire, the central point is that they are always joined to the live wire.

Unit 2: Introductory electronic circuits

LEARNING OUTCOMES

The learner will be able to:

1. design and make and understand basic electronic circuits
2. draw circuit diagrams of the electronic circuits and explain the meaning of the circuit diagrams.

TEACHER GUIDELINES

- The design and construction of electronic circuits are problem-solving exercises.
- Learners should be shown how to construct simple electronic circuits at first. The first circuit should include only a battery and a bulb. Learners should then be lead to design and construct more complex circuits based on bulbs in series and parallel e.g. steady hand game, circuit to identify insulating and conducting materials, quiz games, traffic lights, two-way switches, etc.
- Circuits should contain batteries, switches, fuses, bulbs/buzzers.
- Learners should be encouraged to work in groups and to address a problem to the level of difficulty they are capable of. The more circuits they complete the greater their understanding. They should repeat their efforts to solve the problem in question until the exercise is successful.
- It may be useful for the learners to draw sketches of circuits first, then insert the symbols into the diagrams, then draw circuit diagrams on their own.
- Learners should receive specific instruction on sketching over one or two class periods. Exercises in planning and drawing should form a continuous part of their work throughout the module.

Unit 3: Basic electronic circuits

LEARNING OUTCOMES

The learner will be able to:

1. select and construct a more complex electronic circuit based on a given circuit diagram using as many components as practicable related to Units 2 and 4
2. test the circuit to see if it works and record the results
3. draw a circuit diagram of the circuit
4. produce a report (with photographs) showing the methods and processes.

TEACHER GUIDELINES

- In this unit learners are expected to assemble a project based on their ability to read an existing circuit diagram, and to apply the skills learned earlier in the module to build the circuit.
- The project selected should allow the learner to carry out all the exercises listed in the unit. The teacher may have to assist some learners in some or all aspects of the unit.
- Project circuits may be selected from a variety of resources including those listed in this module descriptor.
- Suitable kits will aid the completion of this unit to a significant degree.
- Demonstrations of previously assembled circuits will help learners to become interested in the unit.

Unit 4: Scientific Experiments

LEARNING OUTCOMES

The learner will be able to:

1. carry out a number of scientific experiments related to electricity and electronics
2. define voltage, wattage, and current, and the relationship between them
3. describe what is meant by 1KW and its basis as the measurement for one unit of electricity
4. read and explain the rating plates on different household electrical appliances.
   - define resistance and variable resistance
   - use multimeters to measure current, voltage and resistance
   - use simple circuits or sample electrical appliances to explain and demonstrate the different operations of:

TEACHER GUIDELINES

- The work in this unit should be linked to the work in Units 1,2 3, 5 and 6.
- Scientific experiments can be carried out at any stage of the module to clarify the learners' understanding of electricity and electronics.

  Possible science experiments include:
  - experiments on static electricity
  - conductor properties of materials and liquids
  - insulation properties of materials
  - the effect of having batteries in series and parallel
  - the effect of having bulbs (resistors) in series and parallel
- Definitions of voltage, wattage, and current, and the relationship between them should be developed in the course of such experiments, as should the consumer information aspects of the module.
- Scientific experiments carried out should have the following characteristics:
  - be relevant to the module
  - be valid scientific experiments
  - be carried out using controls and standardised conditions
  - produce quantitative, informative results in relation to the module which can be recorded in tabulated and/or graph form.

Unit 4: Scientific Experiments (Continued)

LEARNING OUTCOMES

- resistors, potentiometers, and thermistors at relays, timers, transistors, transducers, various types of switches, etc.
- the function of diodes
- the basic function of capacitors
- the use of a transformer.

TEACHER GUIDELINES

- In the remainder of this unit it is expected that different learners will achieve different levels of mastery.
- All learners should have a basic understanding of each of the concepts and components listed opposite, and should then be encouraged to master the use of as many of the components as possible. The operation of these components is best understood through the construction of simple circuits.

Unit 5: Health and Safety

LEARNING OUTCOMES

The learner will be able to:

1. identify hazards related to the use of electricity
2. distinguish between insulators and conductors and describe the safety features of the 3-pin plug and of a number of electrical tools or appliances
3. describe the safety functions of fuses and earthing
4. outline emergency procedures to shut down electric equipment in cases of emergency
5. identify advertisements showing the consequences of incorrect use of plugs, careless wiring, and breaks in insulation materials
6. identify safety features of the electricity system in their homes describe the difference in terms of safety between working with bell wire and batteries on the one hand and working with mains electricity and explain circuit diagram symbols.

TEACHER GUIDELINES

▶ This unit may be implemented by:

- using materials developed by bodies such as The ESB
- using a visitor exercise
- identifying safety precautions in the workplace relevant to electricity
- using textbook materials as a basis for investigation
- investigations based on the electricity system in the home.

Unit 6: The local electricity supply

LEARNING OUTCOMES

The learner will be able to:

1. draw a map tracing the national supply of electricity to his or her locality
2. locate the nearest ESB office
3. list the services provided by the ESB to electricity consumers.

TEACHER GUIDELINES

- This unit can be implemented as a project. It offers the opportunity for investigation outside the school, for visitor exercises in the school, for integration with courses such as Social Education.

Unit 7: Evaluation of learner experiences in the module

LEARNING OUTCOMES

The learner will be able to:

1. list the skills and procedures learned while doing the module
2. identify reasons for elements of success or failure in the project in Units 1, 2 3
3. suggest how the project might be improved upon
4. identify his or her own contribution to the project (group project), as well as that of staff and of other adults
5. describe how their thinking has changed (if applicable) in relation to any feature of life as a result of doing the module including any change of understanding of the notion of technology.

TEACHER GUIDELINES

- This unit may form part of the Personal Reflection Task.
- Learners should be invited to reflect on what they found to be actually important in the module in terms of the headings opposite.
- This exercise can be carried out both on one to one and on a group basis (twos and fours exercise).
- Learners should be encouraged to suggest how they might apply the learning in a simple fashion in future work.
- Incidences where learners respond significantly to learning experiences are very fruitful sources of learner evaluation/reflection.

Unit 8: Presentation of evidence of work completed in the module

LEARNING OUTCOMES

The learner will be able to:

1. present examples of practical work carried out in Unit 1, 2 and 3
2. present the completed project from Unit 3 for inspection
3. working independently of other learners, and with the assistance of the teacher, present a folder containing the following:
   - a description of scientific tests carried out (Unit 4)
   - sketches and short reports of practical work carried out in Units 1, 2 and 3
   - a map tracing the national supply of electricity to his or her locality (Unit 6)
   - the evaluation of the process and products created (Unit 7).

TEACHER GUIDELINES

- This unit does not give rise to any new work other than a drawing together of the work done throughout the module.

RESOURCES

Resources for practical work include batteries, switches, fuses, bulbs/bussers, bell wire, bulb holders etc., all available from Lennox. Satisfactory implementation demands that there be an adequate supply of all of these.

A suitable kit such as:
Adventures with Electronics (Kit and Book) by Tom Duncan;
John Murray (Publisher) Ltd., London.

Chapters on Electricity and Magnetism from commonly used Junior Certificate science textbooks.

Design and Technology by James Garratt Cambridge University Press.

Electronics for You: A Practical Course for GCSE
by Michael McLoughlin Hutchinson (London) 1989.

KEY ASSIGNMENTS

CHECKLIST

I designed and made an extension cable for indoor and outdoor use.	☐
I carried out two scientific experiments related to electricity.	☐
As a member of a group, I made and tested an electronic circuit shown in a given circuit diagram.	☐
I completed a report on the module experience: what I learnt, skills I developed	☐
an out of school experience, further skills I need to develop or improve.	☐

Published by The Stationery Office
To be purchased directly from:
Government Publications Sales Office,
Sun Alliance House,
Molesworth Street, Dublin 2.
Or by mail order from:
Government Publications, Postal Trade Section,
4-5 Harcourt Road, Dublin 2.
Tel: 01-647 6834/5 Fax: 01-475 2760
Or through any bookseller.
Price: £1.50

This programme has been funded by the European Social Fund

Designed by: Langley Freeman Design Group Limited