



## *Agriculture, Horticulture*





LEAVING CERTIFICATE APPLIED

VOCATIONAL EDUCATION

# AGRICULTURE, HORTICULTURE





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## INTRODUCTION

### RATIONALE

Agriculture, Horticulture is an option within the Vocational Education element of the Leaving Certificate Applied. The course is designed to introduce students to the knowledge and basic skills which apply to the efficient and productive use of natural resources. It is envisaged that students will select those areas of study which are relevant to their interests, the local economy and the potential employment opportunities therein.

The course is practical in nature with an emphasis on the out-of-school environment as an important learning resource. The course will contribute to the social and personal development of the individual through the use of a broad range of teaching methodologies. Consequent to this, opportunities for linking with and relating to other elements of the Leaving Certificate Applied should be availed of with the student task playing an important part in any such integration.

A key feature of the course is the range and diversity of modules available. This diversity of provision will allow for the promotion of student creativity, enterprise and innovation and the achievement of the highest possible standards of student performance, while also reflecting the differing needs of students. The design of the course allows for the investigation of areas of study from a general or community based perspective.

In developing the Agriculture, Horticulture course, gender equity, enterprise and available resources have been recognised as key features in determining learning outcomes and the design of learning experiences. It is envisaged that all students will develop basic skills and acquire a level of knowledge that will increase their awareness of the potential for employment and business opportunities or further study and training, relevant to the areas of study they have chosen.



This course aims to introduce students to the study of Agriculture and Horticulture, their allied industries and related leisure, training and career opportunities. Students are helped to develop an understanding and appreciation of the natural environment and of humankind's relationship to it. They are facilitated in developing an interest in and understanding of the uses of natural resources, agricultural and horticultural processes and their effects on the local environment and community.

Students will:

- acquire basic skills associated with agricultural/horticultural processes
- gain the necessary knowledge to understand the purpose and function of biological systems, develop an understanding of the nutritional needs of plants and animals and how they interact, and acquire the necessary knowledge to appreciate the role of micro-organisms in biological and environmental processes
- investigate industries involved in the exploitation of natural resources relevant to the area of study at a local or national level
- be competent and committed to the implementation of good health and safety practices
- develop an ability to investigate and report on chosen aspects of Agriculture and Horticulture
- demonstrate an appreciation and awareness of the knowledge and skills related to their chosen area of study
- observe and experience actual work practices relating to chosen aspects of the course
- investigate career, training and further education opportunities associated with each module they chose and identify any local or state aid/assistance available for related enterprises.

**NUMBER AND SEQUENCE OF MODULES**

Over the two year period 4 modules will be taken, each of at least 30 hours duration. Common themes such as Environmental/Biological processes, Health and Safety, Pollution and non-chemical methods of control of pests/diseases will be explored within the individual modules. Six modules have been developed and they fall into two broad groupings: Horticulture and Agriculture. Students may chose modules across these broad groups. The modules in Horticulture may be seen as being complementary to some of the modules in Agriculture. However they do not form a prerequisite for any of these modules. Each module is a separate entity from which students will acquire a broad understanding of the area of study and develop skills that should be useful and relevant in other areas of life.

**Horticulture**

Module 1: Basic Horticulture

Module 2: Garden Design

Module 3: Floristry, Fruit and Vegetables.

**Agriculture**

Module 4: Forestry

Module 5: Grass

Module 6: Milk and Meat Production.

## DESCRIPTION OF MODULES

### HORTICULTURE

#### MODULE 1

##### *Basic Horticulture*

The key elements are: plant physiology and growing media, propagation methods, soil formation, composition and fertility, garden tools and equipment.

#### MODULE 2

##### *Garden Design*

The key elements are: gardens and their uses, garden design, plants and their uses, lawns.

#### MODULE 3

##### *Floristry, Fruit and Vegetables*

The key elements are: production methods, harvesting, transport and retailing, healthy practices, pests and diseases. flowers, fruit and vegetables.

### AGRICULTURE

#### MODULE 1

##### *Forestry*

The key elements are: industry overview, forestry trees and their biology, climate, site selection and multiple land use.

#### MODULE 2

##### *Grass*

The key elements are: biology of grasses, grassland plants, management and renovation, grass conservation.

#### MODULE 3

##### *Milk and Meat Production*

The key elements are: the animal, its feeding and housing, production of replacement stock, health, environment and safety.

## GENERAL RECOMMENDATIONS

In order to ensure that students achieve high standards within the course, active learning should be a major component of the teaching methodology adopted i.e. students will be actively involved in learning in a variety of ways; group work, research and discovery, discussion, learning centres, role-play, visitor, surveys, media use etc. The use of the out-of-school environment is particularly important, whether through work experience, small group or class visits, or the assistance of specialists in the acquiring of skills.

The learning strategies will at all times facilitate the development of the student's responsibility, self confidence, interpersonal skills, decision making skills and initiative.

Adequate thinking-through of an issue is essential so that the student can be given direction and support in the structuring of research without being directed to specific conclusions.

The learning strategies are student-centred and as such take account of the problems encountered by the student who experiences learning difficulties.

The teacher should encourage students to view the modules in their broadest sense and to discover how the knowledge they have gained and skills they have developed can be transferred to other aspects of everyday living.

**It is important that students experience, and gain a proper understanding of, safe working practices when handling equipment, chemicals and other materials in an agricultural/horticultural environment.**

AGRICULTURE, HORTICULTURE

MODULE 1

# BASIC HORTICULTURE



## MODULE 1:

# BASIC HORTICULTURE

### PURPOSE

This module in basic horticulture is part of the Vocational Educational element of the Leaving Certificate Applied Programme. It is a specialist Module that will enable students to acquire a basic knowledge of propagation techniques, plant physiology and the range of growing media and equipment available for propagation.

### PREREQUISITES

None.

**AIMS**

This module aims:

- to introduce the student to plants as living things with basic needs and sophisticated structures for servicing their life functions
- to give students an understanding of the natural and artificial methods of increasing plant numbers
- to provide an opportunity to investigate the factors that affect plant growth and reproduction
- to give students a basic knowledge of the tools and equipment used to improve plant growth and reproduction
- to encourage students to pursue additional topics of interest in basic Horticulture.

**UNITS**

Unit 1: Plant Physiology and growing media

Unit 2: Propagation methods

Unit 3: Soil formation, composition and fertility

Unit 4: Garden Tools and equipment

## GENERAL RECOMMENDATIONS

The specific learning outcomes prescribed in this module form the basis for an introductory course on basic horticulture. It is envisaged that schools will draw on a wide variety of available resources and outside experts for the completion of the module.

In addition to the exercises described in this module the teacher may select other materials and exercises.

For example:

- Identify common herbs and their uses in cooking, cosmetics and medicine.
- Grow an herb using a suitable propagation and cultural technique.
- Draw up a record of techniques used, and maintenance carried out during the growing process.

While the units will form the basis for any exam-based assessment, additional activities related to the module entered into by students would be acceptable for meeting the requirements of other means of assessment such as the task or practical performance test.

A student-centred activity-based teaching approach should be adopted throughout. Wherever possible theoretical and practical work should be combined. Long theory sessions should be avoided. Use should be made of the following techniques: brainstorming, individual and/or group research, structured group work, case studies, career guidance resources, use of library, learning centres, activities in real or simulated situations.

A visitor exercise may be used for technical input or for careers-related information.



Many of the desired learning outcomes are related to problem-solving exercises that facilitate active learning on the part of the student. It is necessary that the teacher provides guidance and suggestions on the exercises undertaken.

It is also necessary to take every opportunity to encourage the student to utilise his/her existing skills and to develop a wider range of skills, e.g. communication and interpersonal interaction, investigation, planning, negotiating, observation and evaluation.

It is on the basis of the desired learning outcomes that evidence for the terminal assessment is generated and hence, the learning outcomes should provide the focus for record keeping exercises. Teachers and students should draw up a student log book comprising pro-forma activity and record sheets to provide students with a clear focus for their research and other activities and to record their findings.

Students should be encouraged to work in small groups and to repeat their efforts to solve the problem in question until the exercise is successful. When correcting a student's work the teacher must first indicate to the student those areas that show effort and improvement. It is essential that student corrections are acknowledged and reinforced.

## Unit 1: Plant Physiology and Growing media

### LEARNING OUTCOMES

The student will be able to:

1. identify the main parts of the plant and their functions
2. investigate Photosynthesis by carrying out a suitable scientific test
3. identify the function and use of fertilizers
4. identify a range of growing media in use today
5. investigate four different growing media
6. assemble a growing medium specifically used for the growing of seeds
7. evaluate the various methods of making garden compost from garden and household waste.

### TEACHER GUIDELINES

- ▶ The teacher should use appropriate resources, especially actual plant material, for the investigations described. Junior Certificate textbooks outline experiments that could be carried out on water movement and photosynthesis. Growing media should be made available for the student such as seed & potting compost, Moss peat, Perlite, Vermiculite and fine sand.
- ▶ The "Rapitest" kit could be used (available at most garden shops).
- ▶ If time is available planting seeds and monitoring their progress could test various growing media. Students should start a "dictionary" of horticultural terms and give time to accurate filing and presentation of their work.

## Unit 2: Propagation methods

### LEARNING OUTCOMES

The student will be able to:

1. outline three methods used to overcome dormancy
2. demonstrate the general requirements for seed germination
3. select an appropriate sowing technique suitable for a chosen seed type
4. test a chosen seed for % germination
5. care for seedlings using appropriate techniques
6. name two artificial methods of plant propagation
7. list three plants from which cuttings can be taken
8. propagate a named cutting
9. list the safety precautions to be taken when using rooting powders
10. pot up and care for a rooted cutting
11. suggest how two plant structures could be used as a natural method of propagation.

### TEACHER GUIDELINES

- ▶ The following materials need to be assembled in advance:

Seed trays, 4" and 8" pots, watering trays, seed and potting compost, cheshunt compound, secateurs, seeds and mother stock.

Rooting powders are potentially very dangerous and should only be used following strict safety rules – gloves and mask are essential.

For demonstration purposes a placebo such as starch could be used by the students.

Students can also bring in their own plant material from which cuttings can be taken. The plant material should be stored in a sealed plastic bag and put into the bottom of a fridge or another cool place.

### Unit 3: Soil formation, composition and fertility

#### LEARNING OUTCOMES

The student will be able to:

1. state the role of weathering agents in the formation of soil
2. list the living and non-living parts of soil
3. state the characteristics of a fertile soil
4. name four activities associated with good soil management and demonstrate any one of these
5. identify the major Irish soil types and the types of plants they support
6. carry out one scientific investigation related to soil.

#### TEACHER GUIDELINES

- ▶ Leaving Certificate Biology, Agricultural Science or Geography textbooks provide most of the information required here.
- ▶ Use of the schools science laboratory would be ideal here but not essential.
- ▶ A visit from an I.O.F.G.A. member would be useful to discuss the organic approach to soil health.
- ▶ A geological map and a map of land use in Ireland for comparison would also be useful.

## Unit 4: Garden tools and equipment

### LEARNING OUTCOMES

The student will be able to:

1. compile a list of everyday garden tools
2. demonstrate the safe use of two garden tools
3. demonstrate the cleaning and storing of one garden tool
4. identify one motor/electric tool
5. design a poster highlighting the safe use and storage of a motor/electric tool
6. draw up a chart on the maintenance of one garden tool.

### TEACHER GUIDELINES

▶ This unit can be carried out as an investigation with written reports and presentations as follow up exercises.

▶ All students should demonstrate proficiency in the cleaning and storage of one garden tool. Advice can be sought from local experts.

N.B. Students should never operate motor or electrical tools.

## RESOURCES

A huge selection of gardening books is available to support this module.

*RHS Encyclopedia of Gardening* by C. Brickell. 1992.

IOFGA (organic gardening), 56 Blessington Street, Dublin 7.

The Geological Survey of Ireland, Haddington Road, Ballsbridge, Dublin 4.

The Golden Pages.

Access to the Internet.

The local library.

Clipboards and pens.

Digital camera or instamatic camera.

Tape recorder with batteries and built in microphone.



# KEY ASSIGNMENTS

MODULE 1: BASIC HORTICULTURE

## CHECKLIST

I propagated a plant

I properly cleaned and stored a tool

I carried out a test on soil

I completed a report on a visit to a garden centre.





AGRICULTURE, HORTICULTURE

MODULE 2

## GARDEN DESIGN



## MODULE 2:

# GARDEN DESIGN

### PURPOSE

This module in garden design is part of the Vocational Education element of the Leaving Certificate Applied Programme. It is a specialist module that will enable the students to acquire a basic knowledge of skills in the design, construction and maintenance of gardens.

### PREREQUISITES

None.

### AIMS

The module aims:

- to introduce students to the concept of garden design
- to encourage students to investigate aspects of garden design and relate them to a garden plan
- to familiarise the student with the basic maintenance of a garden area.

### UNITS

Unit 1: Gardens and their uses

Unit 2: Garden design

Unit 3: Plants and their uses

Unit 4: Lawns

## GENERAL RECOMMENDATIONS

The specific learning outcomes prescribed in this module form the basis for an introductory course on garden design and its importance in Irish horticulture. It is envisaged that schools will draw on a wide variety of available resources and outside experts for the completion of the module.

In addition to the exercises described in this module the teacher could select other materials and exercises, which are deemed to be beneficial to and suitable for the student.

Areas that might be suitable are as follows:

- Identify a variety of features that would be included in a garden for the physically challenged.
- Assemble a list of features to be included in a garden for children.
- Compile a list of games that can be included when planning design features.
- Select a number of features that could be used to encourage the presence of wildlife in a garden.
- Describe the key features of a low maintenance garden.

While the units will form the basis for any exam-based assessment, additional activities related to the module entered into by students would be acceptable for meeting the requirements of other means of assessment such as the task or practical performance test.

A student-centred activity-based teaching approach should be adopted throughout. Wherever possible theoretical and practical work should be combined. Long theory sessions should be avoided. Use should be made of the following techniques: brainstorming, individual and/or group research, structured group work, case studies, career guidance resources, use of library, activities in real or simulated situations. The visitor exercise may be used for technical input or for careers related information.

Many of the desired learning outcomes are related to problem-solving exercises that facilitate active learning on the part of the student. It is necessary that the teacher provide guidance and suggestions on the exercises that the students undertake.

It is also necessary to take every opportunity to encourage the student to utilise his/her existing skills and to develop a yet wider range of skills, e.g. communication and interpersonal interaction, investigation, planning, negotiating, observation and evaluation.

It is on the basis of the desired learning outcomes that evidence for the terminal assessment is generated and hence, the learning outcomes should provide the focus for record keeping exercises. Teachers and students should draw up a student log book comprising pro-forma activity and record sheets to provide students with a clear focus for their research and other activities and to record their findings.

Students should be encouraged to work in small groups and to repeat their efforts to solve the problem in question until the exercise is successful. When correcting students work the teacher must first indicate to the student those areas that show effort and improvement. It is essential that student corrections are acknowledged and reinforced.

## Unit 1: Gardens and their uses

### LEARNING OUTCOMES

The student will be able to:

1. list the uses to which gardens can be put
2. compare an actual garden with his or her ideal garden as observed in resource materials
3. state the main features that contribute to good design
4. identify different garden styles
5. select structures that can be used when creating a garden.

### TEACHER GUIDELINES

- ▶ Brainstorming uses of gardens from the familiar to the more imaginative is useful as an introduction.
- ▶ A selection of garden design/gardening books, magazines and photographs should be available to the students to aid their research.
- ▶ A visit to one or a number of planned garden developments would probably be of benefit sooner rather than later in the course of this module.
- ▶ Having identified their own preferred style and absorbed the main components of good design students will be in a position to assess actual gardens critically.

## Unit 2: A garden design

### LEARNING OUTCOMES

The student will be able to:

1. draw up requirements for a garden plan on a chosen theme
2. sketch an outline plan
3. select suitable flowers, trees and shrubs for the garden
4. locate flower beds, trees and shrubs on the plan
5. name four hard landscape features that could be used in the plan
6. research the availability of the four named hard landscape features
7. select one special feature for the plan and state how it would be placed in the garden.

### TEACHER GUIDELINES

- ▶ A visitor from the garden design/landscaping industry would be useful to stimulate discussion, further research, and encourage students to explore ideas for implementation into their own plans.
- ▶ Large sheets of paper, graph paper, rulers, scissors and coloured sheets should be available to the students.
- ▶ Students should be encouraged to investigate a wide range of solutions to their chosen theme from resource materials and horticultural suppliers.
- ▶ A display of finished work with a short presentation of work done would be ideal. The presentation should include information gathered, problems encountered, strategies used for overcoming these problems and a simple evaluation.
- ▶ A landscape design CD-Rom may be useful in this section.

## Unit 3 Plants and their uses

### LEARNING OUTCOMES

The student will be able to:

1. name four different flowers
2. demonstrate the propagation of two flowers from seeds
3. demonstrate the planting of two bulbs
4. investigate the effect that can be created with flowers within a garden
5. list four shrubs that can be used in a garden
6. state the uses to which shrubs can be put in a garden
7. plant a small shrub bed or planter
8. name four trees and give the use of each one in the garden
9. correctly plant a tree.

### TEACHER GUIDELINES

- ▶ This unit is mainly practical. The following materials should be assembled in advance:
  - seed trays, seed and potting compost, watering trays, chestnut compound, large clear plastic bags, small blunt sticks, labels, permanent markers, 4" and 6" pots, a selection of seeds and bulbs, trees and shrubs, planters, trowels, spades, shovels, forks and tree stakes.
- ▶ A selection of gardening books, magazines and photographs should be available to the students to aid their research.
- ▶ Learning centres followed by practical activities, student research and student demonstration would be beneficial to the student though these are more time consuming than teacher demonstrations.

## Unit 4: Lawns

### LEARNING OUTCOMES

The student will be able to:

1. state the uses to which lawns can be put
2. name three varieties of seed suitable for growing lawns
3. explain where each of the different lawn seed mixes is used
4. state the jobs involved in preparing soil for a lawn
5. name four common problems associated with lawns and demonstrate how any one of them can be solved.
6. draw up a seasonal maintenance chart for a lawn.

### TEACHER GUIDELINES

- ▶ This unit offers an opportunity for students to research their own information either from learning centres, research materials or interviews with local experts in the horticultural business.
- ▶ If deemed feasible students could engage in further practical activities related to lawns and their maintenance e.g. lay a section of lawn either in trays or on a suitable section of school grounds.



## RESOURCES

A huge selection of garden design books is available to support this module

*The DK Pocket Encyclopedia of Garden Planning* by J. Brook

*The Garden Source book: The essential guide to planning and planting* by T. Smart

*Garden Style* by G.Daly

*Step by Step Ponds, Pools and Rockeries* by P. Swift and J. Szymanowski

*The Garden D.I.Y. Expert* by Dr. D. G. Hessayon

*The Lawn Expert*, by Dr. D. G. Hessayon

*Landscape Design 3D*, CD ROM, Expert Software

Other resources include the following:

The Golden Pages

Clipboards and pens

A digital camera or an instamatic camera

A tape recorder with batteries and built in microphone

White sheets of paper

Graph paper

Access to a phone/mobile phone

Access to the Internet

National Garden Exhibition Centre, Kilquade, Co. Wicklow.

Tel: 01-2819890 Fax: 01-2810359.



# KEY ASSIGNMENTS

MODULE 2: GARDEN DESIGN

## CHECKLIST

I drew an outline plan of a garden

I correctly treated a damaged area of lawn

I participated in the planting of a flower or tree or shrub

I completed a report on a visit to a planned garden development.

MODULE 3

**FLORISTRY, FRUIT AND VEGETABLES**



## MODULE 3:

# FLORISTRY, FRUIT AND VEGETABLES

### PURPOSE

This module in floristry, fruit and vegetables is part of the Vocational Education element of the Leaving Certificate Applied Programme. It is a specialist module which will enable the students to acquire a basic knowledge of the floristry, fruit or vegetable industry from production to retailing and increase their awareness of the potential these areas hold for development and employment.

### PREREQUISITES

None.

## AIMS

This module aims:

- to provide students with an opportunity to focus on one of the three areas in the module and investigate the process of producing, harvesting, storage, marketing and retailing
- to allow students to become familiar with healthy practices when dealing with commercial units and the practical problems encountered with pests and diseases
- to give students scope to explore the uses of flowers, fruits or vegetables.

## UNITS

Unit 1: Production methods

Unit 2: Harvesting, transport and retailing

Unit 3: Healthy practices, pests and diseases

Unit 4: Flowers or Fruit or Vegetables

## GENERAL RECOMMENDATIONS

The specific learning outcomes prescribed in this module form the basis for an introductory course on floristry, fruit & vegetables and their importance in Irish horticulture. It is envisaged that schools will draw on a wide variety of available resources and outside experts for the completion of the module.

In addition to the exercises described in this module the teacher should select other materials and exercises, which are deemed to be beneficial to and suitable for the student.

While the units will form the basis for any exam-based assessment, additional activities related to the module entered into by students would be acceptable for meeting the requirements of other means of assessment such as the task or practical performance test.

A student-centred activity-based teaching approach should be adopted throughout. Wherever possible theoretical and practical work should be combined. Long theory sessions should be avoided. Use could be made of the following techniques: Brainstorming, individual and/or group research, structured group work, case studies, careers-teacher input, use of library, activities in real or simulated situations. The visitor exercise may be used for technical input or for careers related information.

Many of the desired learning outcomes are related to problem-solving exercises that facilitate active learning on the part of the student. It is necessary that the teacher provide guidance and suggestions on the exercises that the students undertake.

It is also necessary to take every opportunity to encourage the student to utilise his/her existing skills and to develop a wider range of skills, e.g. communication and interpersonal interaction, investigation, planning, negotiating, observation and evaluation.

It is on the basis of the desired learning outcomes that evidence for the terminal assessment is generated and hence, the learning outcomes should provide the focus for record keeping exercises. Teachers and students should draw up a student log book comprising pro forma activity and record sheets to provide students with a clear focus for their research and other activities and to record their findings.

Students should be encouraged to work in small groups and to repeat their efforts to solve the problem in question until the exercise is successful. When correcting students' work the teacher must first indicate to the student those areas that show effort and improvement. It is essential that student corrections are acknowledged and reinforced.

## Unit 1: Production methods

### LEARNING OUTCOMES

In the case of either a flower or a fruit or a vegetable the student will be able to:

1. name two types
2. state the conditions suitable for growth
3. select the ideal soil conditions for healthy growth
4. devise methods for extending the growing season
5. design a set of instructions for the care of a crop
6. list three differences between a large scale and a small-scale production unit
7. name the State bodies and other groups involved in the development of this industry.

### TEACHER GUIDELINES

- ▶ Practical investigation is the best approach to this unit. This is achieved through visits, interviews, and questionnaires with follow up exercises of record keeping, displays, recordings and presentation.
- ▶ Careful preparation of the student for these types of activities is essential. Preparation should include co-operation with the English and Communication module on letter writing and telephone skills using role plays where appropriate.



## Unit 2: Harvesting, Transport and Retailing

### LEARNING OUTCOMES

In the case of either a flower or a fruit or a vegetable the student will be able to:

1. state the most suitable time for harvesting one commercially grown crop
2. list three criteria used in the selection of the best products
3. select the best method of harvesting a commercially grown crop
4. identify a grading system used to classify the quality of a commercially grown crop
5. comment on the working of a large marketing centre
6. list the special requirements and methods used in transporting the named crop
7. comment on the organisation of a retailing outlet.

### TEACHER GUIDELINES

- ▶ Practical investigation is the best approach to this unit. This is achieved through visits, interviews, and questionnaires with follow up exercises of record keeping, displays, recordings and presentation.
- ▶ Careful preparation of the student for these types of activities is essential. Preparation should include co-operation with the English and Communication module on letter writing and telephone skills using role plays where appropriate.

### Unit 3: Healthy practices, pests and diseases

#### LEARNING OUTCOMES

In the case of flowers, fruit or vegetables the student will be able to:

1. draw up a list of jobs to be done to keep a commercially grown crop healthy
2. name one pest that could damage the crop and state a symptom caused by the pest
3. give one traditional and one organic method of controlling the pest
4. name one disease that could damage the crop and state the symptoms of the disease
5. give one chemical and one non-chemical method of treating the disease.

#### TEACHER GUIDELINES

- ▶ Practical investigation is the best approach to this unit. This is achieved through visits, interviews, and questionnaires with follow up exercises of record keeping, displays, recordings and presentation.
- ▶ Careful preparation of the student for these types of activities is essential. Preparation should include co-operation with the English and Communications module on letter writing and telephone skills using role plays where appropriate.

## Unit 4: Flowers/Fruit/Vegetables

### LEARNING OUTCOMES

The student will be able to:

#### **FLOWERS**

1. select suitable flowers and foliage for specific uses and effects
2. carry out simple maintenance techniques that prolong the life of cut flowers
3. list the basic tools and equipment used in floristry
4. discuss the Art of Composition relating to colour, texture, form and scent
5. select the flowers and foliage available during the different seasons
6. create a composition based on a chosen theme
7. cost the composition and compare it with a similar composition from a flower shop.

*OR*

#### **FRUIT**

1. state the nutritional value of fruit in our diet
2. name two Irish fruits and two exotic fruits and say where each is produced
3. name three ways in which fruit can be used in the daily diet

### TEACHER GUIDELINES

- ▶ This unit has two main elements – research and practical activities.
- ▶ Information is best collected from experts involved in the industry. However, students can do their own initial research by investigating suitable resources such as books, videos and learning centres.
- ▶ A visitor such as a florist, dietitian or chef could be useful.

**Unit 4: Flowers/Fruit/Vegetables (Continued)**

**LEARNING OUTCOMES**

4. make a poster that promotes fruit as a healthy option in our diet
5. outline the role of fruit consumption in the prevention of disease.

*OR*

**VEGETABLES**

1. state the nutritional value of vegetables in our diet
2. name two Irish vegetables and two exotic vegetables and say where each are produced
3. name three ways in which vegetables can be used in the daily diet
4. make a poster that promotes vegetables as a healthy option in our diet
5. outline the role of vegetable consumption in the prevention of disease.

**TEACHER GUIDELINES**

## RESOURCES

*The Fruit Expert* by Dr. D.G. Hessayon

*The Vegetable Expert* by DR. D. G.Hessayon

*DK Pocket Encyclopedia on flower arranging.*

Malcolm Hiller has a range of books on flowers including The Little Scented Library with many projects to choose from.

The Irish Flower Council

Teagasc – contact your local branch

The Department of Agriculture Food and Forestry – the food division.

An Bord Bia – Clanwilliam Court, Lower Mount Street, Dublin 2.

Phone: (01) 6685155 Fax: (01) 6687521.

The Fresh Fruit and Vegetable Centre, 22 Merrion Sq, Dublin 2.

Phone: (01) 6614105 Fax: (01) 6614106.

An Bord Glas – the horticultural development board 8-11 Lower

Baggot St., Dublin 2. Phone: (01) 6763567 Fax: (01) 6767347.



# KEY ASSIGNMENTS

MODULE 3: FLORISTRY, FRUIT AND VEGETABLES

## CHECKLIST

I recorded an interview carried out in relation to the methods used in one area of production.

I designed a chart in relation to one chemical or non-chemical method of control of a pest or a disease

I carried out a survey on some aspect of marketing or retailing

I carried out a practical activity based on the production of flowers or fruit or vegetables.

MODULE 4

**FORESTRY**



## MODULE 4:

# FORESTRY

### PURPOSE

This module in forestry is part of the Vocational Education element of the Leaving Certificate Applied Programme. It is a specialist Module which will enable the student to acquire a basic knowledge of the biology of trees, the Forestry Industry, and its present and potential impact on local communities and the environment.

### PREREQUISITES

None.



## AIMS

This module aims to:

- convey the significance of the forestry industry in Ireland
- develop an understanding of the effect of climate and weather on forestry activities
- enable students to identify common forestry trees
- provide students with the skills to propagate a tree seed
- develop the students awareness of the end products of the forestry industry
- investigate the basic skills and techniques required for employment in the industry, and the career opportunities therein
- develop the students awareness of the present and potential impact of forestry on the environment
- help students acquire a basic knowledge of tree biology.

## UNITS

Unit 1: The forestry industry in Ireland

Unit 2: Common forestry trees and their biology

Unit 3: Climate, site selection and multiple land use.

## GENERAL RECOMMENDATIONS

The specific learning outcomes prescribed in this Module form the basis of an introductory course on forestry in Ireland and the biology of trees. It is envisaged that teachers will draw on the wide range of available resources and outside experts.

In addition to the exercises described in the Module teachers should select other material and exercises, which are deemed to be beneficial to, and suitable for the students.

For example:

- Investigate the potential for a small-scale forestry related enterprise;
- Investigate in more detail the production, harvesting and processing of timber.
- The planting and care of trees
- Develop a small-scale arboretum

While the units will form the basis for exam-based assessment, additional activities related to the module entered into by students would be acceptable for meeting the requirements of other means of assessment such as the task or practical performance test.

A student centred, activity based approach should be adopted throughout. Long theory sessions should be avoided through the combination of practical and theory, and the use of techniques such as brainstorming, individual and/or group research, structured group work, presentations by students, role-play, visitors, or appropriate out of school activities. It is necessary that the teacher provide guidance and suggestions on the exercises which students undertake. It is important that teachers use every opportunity to develop students' specific skills as related to the module, and a wider range of skills such as communication and interpersonal investigation, planning, observation and evaluation skills.

Teachers and students should design pro-forma activity, recording and evaluation sheets, so as to provide students with a clear and uniform focus for recording research and other activities, and provide ongoing motivation through positive evaluation.

The resources listed will provide the teacher with all the information necessary to deal with this Module.

The help of locally based experts is also of obvious benefit. The 'Project Forest' pack available from the Tree Council of Ireland is an excellent interactive resource. Its possibilities go well beyond this module.

## Unit 1: The forestry industry in Ireland

### LEARNING OUTCOMES

The student should be able to:

1. list the major forestry products and their uses
2. use a map to identify major areas of forestry in Ireland
3. summarise the role of the Forestry Service and Coillte
4. prepare a report on the main uses of Irish forestry products
  
5. list common injuries in forestry work
6. recognise possible hazardous situations
7. be aware of the importance of safe practice
8. be aware of the importance of training and protective clothing
9. devise a list of general safety precautions.

### TEACHER GUIDELINES

- ▶ This unit could easily lend itself to a very traditional approach and so the challenge to the teacher is to devise as many practical activities as possible for the students. Rather than teachers presenting the material, students should be encouraged to find the information through Learning Centres, The Internet, Video and other carefully chosen literature culminating in a presentation of their findings to the rest of their peers. Teachers should assist in the drafting of presentations. The source of all relevant information is the Forestry Service. A standard tourist map should be sufficient for identifying major areas of forestry.
  
- ▶ Safe practices in forestry are best covered using a specialist visitor. A safety statement, as required under legislation, and as prepared by the appropriate authorities, would also be useful. The above should also be backed up by a visit to a forestry site.

## Unit 2: Common forestry trees and their biology

### LEARNING OUTCOMES

The student should be able to:

1. recognise 8 (4 deciduous, 4 evergreen) common commercial species, using either leaves, buds, twigs, bark, fruit, flowers or form
2. acquire a basic knowledge of the principal features of plants and their functions, i.e. root, stem, leaves, flowers and fruit
3. calculate the age of a tree using a cross section
4. identify seeds from trees grown locally, and harvest them at the appropriate time
5. treat seeds to overcome dormancy if necessary

### TEACHER GUIDELINES

Common forestry species include the following:

- ▶ Ash, Beech, Oak, Sycamore, Douglas Fir, Grand Fir, Noble Fir, Hybrid Larch, Japanese Larch, Lodgepole Pine, Scots Pine, Norway Spruce, Sitka Spruce, Western Hemlock, Western Red Cedar. These can be identified with illustrated books and keys such as the "Collins Gem Guide to Trees".
- ▶ Students should make a clearly labelled collection of leaves and twigs from species selected.
- ▶ This is a largely practical unit, and seeds can be collected locally at appropriate times, or purchased through Seed Merchants.
- ▶ Breaking dormancy may involve scarifying (nicking or soaking), or stratification (pit, pot in the ground, or plastic bag in the fridge), and varies from species to species.

Unit 2: Common forestry trees and their biology (Continued)

LEARNING OUTCOMES

6. propagate a tree from seed
7. identify the parts of a winter twig from a deciduous tree e.g. Ash
8. devise a method to measure the girth and height of a selected tree.

TEACHER GUIDELINES

- ▶ Seeds from the following trees may be prepared and planted: Oak, Horse Chestnut, Ash, Sycamore, Beech, Sitka Spruce, Lodgepole Pine, Holly, Sweet Chestnut, Douglas Fir.
- ▶ The structure of the winter twig could be set as one of a number of tasks associated with a 'Learning Centre' specifically designed for this module.
- ▶ The aid of the teacher of Mathematical Applications could be employed here if a solution based on formulae is considered. Otherwise a length of twine, a straight stick and a measuring tape could be used, (Standing well back from a tree hold a stick at arm length and line up with the height of the tree. Rotate the stick through 90 degrees until it is parallel with the ground and mark the position of the tree top. Now measure from the actual base of the tree to this position for a rough estimation of the height of the tree). Brainstorming of students would throw up some interesting proposals for discussion.

### Unit 3: Climate, site selection and multiple land use

#### LEARNING OUTCOMES

The student should be able to:

1. take instrument readings from a simple weather station, i.e., max. and min. thermometer, wet and dry bulb thermometer, rain gauge
2. be aware of the effects of climate, weather on Ireland's suitability as a timber producer
3. be aware of the effect of wind on species selection
4. list the site requirements for a common deciduous and coniferous forest species

#### TEACHER GUIDELINES

- ▶ A good source of information on instruments and their use is the Earth Science option in standard Junior Certificate science texts.
- ▶ Students could compare the daily temperatures and rainfall with that of other nations, e.g. Scandinavian countries. Relevant information can also be obtained from the Meteorological Office in Dublin.
- ▶ Specific information in relation to land use and site requirements is best got from a visit or visitor. The students' own observations in relation to where forestry is located and the type of tree planted in these locations should be elicited from them. Individual/groups of students could be assigned specific questions to which they must find an answer and communicate it to the whole group using any means they so wish, i.e. verbal, or visual. A similar approach is useful when dealing with the environmental implications of forestry.

Unit 3: Climate, site selection and multiple land use (Continued)

LEARNING OUTCOMES

5. explain the potential for conflict in competing land use, and suggest ways of integrating agricultural, leisure and forestry needs
6. compile a report on the potential leisure uses of various forest types in the local area
  
7. explain how forestry will affect the environment in respect of habitats, landscapes, areas of scientific interest, archaeological sites, fisheries and wildlife

TEACHER GUIDELINES

- ▶ There is considerable conflict from time to time over planned forestry development. Relevant sources of information are: An Taisce, The Irish Farmers' Association (I.F.A.), The Association for Adventure Sports (AFAS), and The Federation of Mountaineering Clubs of Ireland (F.M.C.I.) and other relevant organisations. Students could investigate this issue and present the opposing positions. 'Project Forest' and the 'Forestry Pack', which should be in all schools (2 videos) deal with this issue. A local 'An Taisce' person would be a useful source of information. *'Friends of the Irish environment'* have a detailed web site with many useful links.
- ▶ Many of the organisations mentioned above are also relevant sources of information on the environmental implications of forestry, as are local and national fishery organisations and the E.S.B.
- ▶ The ecology section in Leaving Certificate Texts can be a useful source of information and provide simple pollution tests.



Unit 3: Climate, site selection and multiple land use (Continued)

LEARNING OUTCOMES

8. suggest ways in which the impact of forestry on people, animals and the environment can be minimised.

TEACHER GUIDELINES

- ▶ Advantages of forestry include: increase in precipitation, non-polluting land use, prevention of erosion, decrease in silting up of rivers. Disadvantages are: more water absorbed, so less available to rivers, acidity of run-off may be increased on certain soils. Other issues relating to forestry are: access to mountains restricted, changing of habitats, use of pesticides and chemicals, recreational use of forests.

## RESOURCES

*The Tree and Shrub Expert* by Dr. D.J. Hessayon, 1983.

*Tree Projects for Schools*, An Foras Forbatha

*RHS Encyclopedia of Gardening*, by C. Brickell, 1992.

*Trees for Small Gardens* by The Royal Horticultural Society.

*Project Forest*, Tree Council of Ireland

*Thompson & Morgan. Seed Catalogue.*

*Forests a Resource for All*, Department of Agriculture,  
Food and Forestry (2 videos and notes), 1994

Enfo Videos and Information Leaflets, ENFO

## ORGANISATIONS

Forestry Service, Leeson Lane, Dublin 2 01 6766363

Coillte Teoranta, Leeson Lane, Dublin 2 01 6615666

Teagasc, 19 Sandymount Ave. Ballsbridge, Dublin 4 01 688188

Crann, Aughavas, via Cavan, Co. Leitrim

Irish Timber Growers Assoc., Knockranny, Kilmacanogue,  
Co. Wicklow 01 28633681

Society of Irish Foresters, C/O Royal Dublin Society, Ballsbridge, Dublin 4

Tree Council of Ireland, 33 Botanic Rd., Glasnevin, Dublin 9

Irish Timber Council, 7 Mount Crescent St., Dublin 2

Wildlife Service, Office of Public Works, 51 St. Stephen's Green, Dublin  
2

An Taisce, The National Trust for Ireland,  
Tailors Hall, Back Lane, Dublin 8.

ENFO - The Environmental Information Service,  
17 St. Andrews St., Dublin 2

E.S.B., Lr. Fitzwilliam St., Dublin 2

Earthwatch, Harbour View, Bantry, Co. Cork

Regional Fisheries Boards.

Greenpeace, 44 Upper Mount St., Dublin 2

"Wood as a Fuel Programme", ETSU, B149, Harwell, Oxon, OX11 0RA.

Central Fisheries Board, Glasnevin, Dublin.

**USEFUL WEB SITES:**

**The Central Forest Scotland:**

A well designed site of this forest area it has some useful information and links.

<http://www.csct.co.uk/index.htm>

**Trees of Time and Place:**

Nicely done, simple instructions on rearing trees from seeds, from collecting to treating to planting, facility to ask questions and search for further information.

<http://www.totap.org.uk/tree.html>

**Forests Forever:**

Good site with useful resources, quiz's, puzzles, projects, teacher resources.

<http://www.forestsforever.org.uk/>

**Colorado State Forest Service:**

Some useful information on this U.S.A. based site.

<http://www.colostate.edu/Depts/CSFS/csfsnur.html>

**Dept. of Agriculture and Food:**

Some information on Forestry available from this site.

<http://www.irlgov.ie/daff/>

**Central Statistics Office:**

Raw statistics on forestry, includes a search facility.

<http://www.cso.ie>

**Coillte:**

Ok site for information on Coillte, slow to load.

<http://www.coillte.ie>

It should be noted that some of these sites may lapse in time but browsing the web will lead one to numerous similar sites.



## KEY ASSIGNMENTS

MODULE 4: FORESTRY

### CHECKLIST

I prepared and planted a tree seed

I collected and named the leaves, twigs and fruit of two deciduous and two coniferous trees

I visited a forestry related enterprise

I completed a report on one aspect of the Irish Forestry Industry.

MODULE 5

**GRASS**



## MODULE 5:

### GRASS

#### PURPOSE

This module on Grass is part of the Vocational Education element of Leaving Certificate Applied programme. It is a specialist module, which will enable the student to acquire basic knowledge and skills in relation to grass, its management and conservation. The module relates wholly to the agricultural aspect of the course.

#### PREREQUISITES

None.

## AIMS

This module aims to:

- develop the students' awareness of the importance of grass in Irish agriculture
- acquire basic skills and knowledge in grassland management and the conservation of grass
- develop the students' awareness of the methods employed in the harvesting and conservation of grass
- outline the biology of grasses
- investigate the variation in sward composition as a result of soil type and pH
- develop the students' awareness of the present and potential impact of grassland management and conservation on the environment
- encourage safe working procedures.

## UNITS

Unit 1: Grass

Unit 2: Grassland Plants, management and renovation

Unit 3: Grass Conservation

## GENERAL RECOMMENDATIONS

The specific learning outcomes prescribed in this module form the basis for an introductory course on grass and its importance in Irish agriculture. It is envisaged that schools will draw on a wide variety of available resources and outside experts for the completion of the module.

In addition to the exercises described in this module the teacher should select other material and exercises, which are deemed to be beneficial to and suitable for the student. Areas, which might be suitable, are as follows:

- The biology of grass flowers.
- Identification of common grasses.
- Dry matter and dry matter digestibility.
- Grass mixtures and their uses.
- Criteria for sward quality and productivity.
- Reseeding of grassland.
- Animal requirements.

While the units will form the basis for exam-based assessment, additional activities related to the module entered into by students would be acceptable for meeting the requirements of other means of assessment such as the task or practical performance test.



A student-centred, activity-based teaching approach should be adopted throughout. Wherever possible theoretical and practical work should be combined. Long theory sessions should be avoided. Use could be made of the following techniques: brainstorming, individual and/or group research, structured group work, case studies, careers-teacher input, use of library, activities in real or simulated situations. The visitor exercise may be used for technical input or for careers-related information.

Many of the desired learning outcomes are related to problem-solving exercises which facilitate active learning on the part of the student. It is necessary that the teacher provide guidance and suggestions on the exercises, which the students undertake. It is also necessary to take every opportunity to encourage the student to utilise his/her existing skills, and to develop a wider range of skills, e.g. communication and interpersonal interaction, investigation, planning, negotiating, observation and evaluation.

It is on the basis of the desired learning outcomes that evidence for the terminal assessment is generated, and hence the learning outcomes should provide the focus for record keeping exercises. Teachers and students should draw up a student log book comprising pro forma activity and record sheets to provide students with a clear focus for their research and other activities, and to record their findings.

Students should be encouraged to work in small groups and to repeat their efforts to solve the problem in question until the exercise is successful.

The resources listed at the end of the module will provide the teacher with all the information necessary to deal with this module. The help of locally available experts is also of obvious benefit.

Teachers are not bound to follow units in any particular order. However the safety aspects of working with chemicals and equipment cannot be overlooked and should serve as an introductory lesson to the module.

Teachers should liaise with the maths department in the area of calculations. A Glossary of new terms would be a useful way by which students could record new words and their meaning.

The organic aspect of plant production and pest/weed control should be seriously looked at as an alternative. Information can be obtained from IOFGA (details in Resource section). The green keeper attached to a golf course would be a useful person for students to visit or use as a visitor to talk about weed and pest control.

## Unit 1: Grass

### LEARNING OUTCOMES

The student will

1. investigate the significance of grassland in Irish agriculture
2. collect and identify one variety of grass, e.g. ryegrass
3. identify the main parts of the grass plant, i.e. root, stem, leaf and flower
4. sow some grass seed in trays

### TEACHER GUIDELINES

- ▶ A brief walk in the school grounds should be sufficient for students to discover that there are different types of grasses.
- ▶ They should be encouraged to collect a sample of grass and return to the classroom to study it and sketch its appearance.
- ▶ Students should use reference materials or a 'Learning Centre' to identify the main parts of the grass plant, i.e., adventitious roots, stem, leaf (sheath, blade), and flower (inflorescence or spike/spikelet). The terms in brackets may be useful in identifying grasses, though species such as ryegrass or annual meadow grass are very common and easily recognised by their flower. Small samples of individual species, (course/fine) could be sown on cotton wool in beakers to observe some of the physical differences.
- ▶ Samples of seed mixtures sown in seed trays would be useful for further experimentation and observation during the module.

## Unit 1: Grass (Continued)

## LEARNING OUTCOMES

5. be aware of the effect of soil type and soil pH on plant type and growth
6. explain the effect of climate in its broadest sense on grass growth
7. be aware of the importance of the seasonal variation in grass growth
8. investigate the role of clover in grassland.

## TEACHER GUIDELINES

- A study of this unit is best carried out by students selecting two contrasting grassland sites and comparing them visually by estimating the amount of grass, clover, weeds, the leafiness/density of the grass and the rate of growth of the grass (vigour). Further comparisons include the physical features of the sites such as drainage, soil type/composition and soil pH. A simple fractionation of soil samples, pH test and % water test would suffice for comparison purposes. A brainstorming session drawing on student's own knowledge and experience should be sufficient to establish that grass growth is greater in Ireland than many other countries and that growth is greatest in the late spring and summer.

## Unit 2: Grassland plants, management and renovation

### LEARNING OUTCOMES

The student will

1. list four species of grass commonly used in agriculture
2. outline the characteristics of two of the species selected
3. collect and identify three different plants other than grass found in grasslands
4. identify two poisonous plants commonly found in grassland
5. investigate weed control on a sample area of grassland
6. be aware of the effect of topping on a sample area of grassland
7. demonstrate the effect of two different fertilisers on grass growth
8. outline a method used to drain grassland.

### TEACHER GUIDELINES

- ▶ Students should first be introduced to the differences, based on observation, between different grasses and encouraged to bring in a number of samples of different looking grasses.
- ▶ Clovers are important for their ability to fix nitrogen from the air, their higher protein content, palatability, and rich mineral content.
- ▶ Grass mixtures generally contain a mixture of grass species, but also clovers.
- ▶ Species of grassland plants poisonous to some animals include ragwort, bracken, yew, laurel, horsetails, hemlock, foxglove, rhododendron, deadly nightshade, and buttercup.
- ▶ The use of test areas marked out on a school lawn would suffice for the investigation of good grassland management practices.
- ▶ Good management practices include fertilising for N, P & K, topping, and weed control.
- ▶ The test areas can be used to contrast the use/non-use of these management practices.

### Unit 3: Grass conservation

#### LEARNING OUTCOMES

The student will

1. investigate the chemical/biological basis for the conservation of grass
2. prepare a sample of laboratory hay or silage
3. compare the feeding value of both hay and silage
4. investigate the consequences of poor storage of hay or silage

#### TEACHER GUIDELINES

- ▶ The biological/chemical basis of preservation should involve no more than an introduction to the term fermentation, and the inability of rotting bacteria/fungi to live in acid/anaerobic/dry conditions.
- ▶ A simple demonstration involving dried, moist and acid soaked bread would serve to illustrate this point.
- ▶ Poor storage involves the failure to comply with the above conditions. Poor storage of hay relates to proper protection from the elements, stacking and quality of the initial product. For silage, proper compaction and sealing are crucial. The use of additives could be looked at here. Practical tests could be designed by students to investigate some of the effects of improper storage.

### Unit 3: Grass conservation (Continued)

#### LEARNING OUTCOMES

5. determine the environmental implications of silage production and how they can be minimised
6. identify two machines involved in the production of hay or silage
7. describe the processes involved in the making and storage of hay or silage
8. devise a list of general safety precautions to be used in the operation of farm machinery.

#### TEACHER GUIDELINES

- ▶ Environmental implications include intensive farming, decline of the corncrake given the switch from hay to silage, leaking of nitrate fertilisers into rivers causing algae and weed blooms, the problem of silage effluent and its escape into rivers.
- ▶ This aspect of the module can be tackled using an appropriately designed learning centre, brainstorming students on their own knowledge, visits to farms etc. using questionnaires, research by students followed by a presentation of their findings, production of charts practical investigations etc.

## RESOURCES

Junior Certificate Science Texts

Leaving Certificate Agricultural Science Texts

*Grasses* by C.E. Hubbard, Penguin.

Teagasc Leaflets.





# KEY ASSIGNMENTS

MODULE 5: GRASS

## CHECKLIST

I sowed a sample of grass seed

I displayed a chart on an aspect of grass production and conservation

I produced a sample of laboratory hay or silage

I compiled a report on a visit to an enterprise involved in grassland management (e.g. farm, parkland, golf course or sports ground).



MODULE 6

**MILK AND MEAT PRODUCTION**



## MODULE 6:

# MILK AND MEAT PRODUCTION

### PURPOSE

This module on milk and meat is part of the Vocational Education element of the Leaving Certificate Applied programme. It is a specialist module, which will enable the student to acquire basic knowledge and skills in the management and production of milk and meat animals. The term meat is used in its broadest sense so as to encompass all meat animals i.e. cattle, sheep, pigs, and deer. Milk production is not necessarily confined to that of the cow.

### PREREQUISITES

None.

## AIMS

This module aims to:

- develop the students' awareness of the characteristics of the milk or meat animal
- enable the students to identify the factors involved in the feeding, management and housing of the animal
- investigate the production of replacement stock
- investigate the impact of milk or meat production on the environment
- develop safety and hygiene practices in the production of milk or meat
- develop the students' awareness of the causes, symptoms, treatment and preventative measures for diseases of milk or meat animals.

## UNITS

Unit 1: The Milk/Meat Animal its Feeding and Housing

Unit 2: Production of Replacement Stock

Unit 3: Health, Environment and Safety

## GENERAL RECOMMENDATIONS

The specific learning outcomes prescribed in this Module form the basis of an introductory course on the management and production of milk/meat animals. It is envisaged that teachers will draw on the wide range of available resources and outside experts.

In addition to the exercises described in this module the teacher should select additional material and exercises, which are deemed to be beneficial to, and suitable for the students. Areas which might be suitable are as follows;

- Investigate the equipment used on milk farms, its maintenance and hygiene.
- Visit a mart and observe and record the process of transporting and selling of animals.
- Carry out a study of the preparation of milk and meat for sale in the 'raw' state or as a processed product.

While the units will form the basis for any exam-based assessment, additional activities related to the module entered into by students would be acceptable for meeting the requirements of other means of assessment such as the task or practical performance test.

It is envisaged that teachers will draw on the wide range of available resources and outside experts.

A student centred, activity based approach should be adopted throughout. Long theory sessions should be avoided through the combination of practice and theory, and the use of techniques such as brainstorming, individual and/or group research, structured group work, presentations by students, role play, visitor, farm visits, farm profiles and appropriate out of school activities. It is necessary that the teacher initially provide guidance and suggestions on the exercises which students undertake. It is important that teachers use every opportunity to develop students' specific skills and a wider range of skills such as communication and interpersonal, investigation, planning, observation and evaluation skills.

Teachers and students should design pro-forma activity, recording and evaluation sheets, so as to provide students with a clear and uniform focus for recording research and other activities, and provide ongoing motivation through positive evaluation.

The resources listed on page 81 will provide the Teacher with all the information necessary to deal with this module. The help of locally based experts is also of obvious benefit. The principal resources are farms in the locality, which demonstrate the various activities in this module.

## Unit 1: The Milk/Meat animal, its Feeding and Housing

### LEARNING OUTCOMES

The student will:

1. visit a farm and identify the characteristics of one milk or meat breed
2. be aware of the role of the animal in the local economy
3. know the meaning of a dual-purpose animal
4. outline the feeding requirements from birth of a selected milk/meat animal
5. be aware of the significance of the calving period for milk or meat production
6. describe the feeding and housing systems used on one milk or meat farm
7. investigate the correct preparation, storage and disposal of feedstuffs
8. indicate how good environmental conditions are provided for in farm buildings.

### TEACHER GUIDELINES

- ▶ The approach to this unit should be as practical as possible. Students should research the chosen animal's basic characteristics by accessing the local library, Agricultural Science books, visiting a local vet, Teagasc official or farmer. A suitable end product is a wall chart of about A3 size.
- ▶ A 'Learning Centre' could be constructed to cover this and other aspects of the module.
- ▶ Students could brainstorm the ingredients of a healthy diet and apply this to the animal they are studying. From this they can go on to investigate the dietary needs of animals at varying times of the year and while pregnant, about to give birth and after birth has taken place.
- ▶ This can then be followed by a visit to a farm or farms where a carefully constructed questionnaire is used to cover other areas within the unit i.e. feeding systems, housing design etc. The students could draw rough sketches of the housing and farm layout and bring their findings to a construction studies teacher to discuss their findings. If a number of farms have been visited then an ideal structure might be identified.



## Unit 2: Production of replacement stock

### LEARNING OUTCOMES

The student will

1. visit a milk/meat farm and discuss the methods used to impregnate animals
2. be aware of the importance of selective breeding in producing replacement stock

### TEACHER GUIDELINES

- ▶ Information obtained from animal breeding societies could be used to prepare the students for a visit to a milk/meat farm. A visit to an A.I. station or from an individual involved in A.I. could address some of the issues that may arise here. For these visits students should compile a questionnaire, or list of questions, on the methods of breeding animals, including the obtaining and storing of semen, insemination, timing of breeding, signs/symptoms etc.
- ▶ The term pedigree can be introduced initially in relation to domestic pets if desired then related to the farming situation. Questions on the desirable age and weight for breeding of the animal can be discussed.

**Unit 2: Production of replacement stock (Continued)**

**LEARNING OUTCOMES**

3. name a symptom indicating that the animal is in heat/oestrus
4. be aware of the care necessary for a pregnant animal
5. investigate the procedures to be carried out prior to birth
6. outline the procedures to be carried out in caring for the offspring immediately after birth
7. list the conditions necessary for good health and proper housing of young animals
8. outline the role of public bodies in relation to breeding at a local and national level.

**TEACHER GUIDELINES**

- ▶ A follow up visit to a farm could be used to discuss the details of calving e.g. signs of calving, calving equipment used during and after calving, the feeding of the young animal for the first weeks of life. The importance of colostrum, milk replacer and hay or other important foods could be investigated at this point also. Establish the reasons for the mortality of young animals and compile a chart on their proper care. Draw a diagram of a calf house and the measurement of basic environmental factors e.g. temperature could be considered. Leaving Certificate Agricultural Science books and Department of Agriculture and Food publications provide sources of information for this section. Visits or a visitor to the classroom (well prepared) is a much more stimulating method to employ.

### Unit 3: Health, Environment and Safety

#### LEARNING OUTCOMES

The student will:

1. list the measures taken in farm building design to protect the environment

#### TEACHER GUIDELINES

- ▶ Sources of pollution could be listed as a result of a 'brain storming' session of students. Students should be encouraged at the onset of the module to write to various environmental groups, the Department of Agriculture and Food and other farm related organisations to compile information on farms and pollution. Groups of students could be asked to make a presentation of their findings to the class as a whole. These can then be discussed in terms of the methods that could be employed to prevent or contain sources of pollution culminating in a visit to a farm to observe same.

### Unit 3: Health, Environment and Safety (Continued)

#### LEARNING OUTCOMES

2. observe systems for the collection, storage and disposal of wastes
3. outline the legal, environmental and health implications associated with the disposal of dead animals and animal offal
4. be aware of the human health factors in the care and treatment of animals
5. identify a notifiable disease associated with the animal
6. be aware of the role of public bodies in relation to pollution, disease control, disposal of wastes and the enforcement of the appropriate legislation
7. know the cause, a symptom, method of transmission, treatment and prevention of any one disease/parasite that may affect the animal
8. outline the safety measures to be taken to ensure the prevention of accidents on a farm you have visited.

#### TEACHER GUIDELINES

- ▶ A visitor to the class would probably be the best way to tackle the issue of disposal of animal wastes, disease and the health implications for humans. All aspects of safety in terms of power lines, power points, floor surface, slurry tanks etc. should be discussed. Charts could be used to compare the ideal in relation to pollution control/waste disposal and what students may find on their visits.

## RESOURCES

*Farm Animals* Collins Gem series, Harper Collins 1983.

*The Principles of Dairy Farming*, (or other titles for beef, sheep, pigs),  
by Ken Slater, Farming Press, 1991.

*Modern Deer Farm Management* by Yerex & Spiers, GP Books, 1990.

*Indoor Beef Production* by Hardy & Meadowcroft, Farming Press, 1990.

*A Cool Eye Towards Animal Welfare*, Eden, Blackwell Science,  
1994. John Webster.



# KEY ASSIGNMENTS

MODULE 6: MILK AND MEAT PRODUCTION

## CHECKLIST

I have completed a report on a visit related to this module

I produced a design layout for a pollution free farm

I produced a chart on the proper care and housing of an animal

I gave a brief illustrated talk on one aspect of the module.



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