



Kingdom of Lesotho
Ministry of Education and Training

LESOTHO GENERAL CERTIFICATE OF SECONDARY EDUCATION

Lesotho General Certificate of Secondary Education Syllabus

Agriculture

0179

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National Curriculum Development Centre
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1. INTRODUCTION

1.1 Rationale

The Lesotho General Certificate of Secondary Education (LGCSE) syllabus is a two year programme of study which builds up on the foundation of the three year Junior Certificate programme. This syllabus will impart to learners the cognitive, psychomotor, and affective skills, therefore preparing learners for tertiary institutions and self-employment. Through this syllabus the learners become:

- confident in working with information and ideas (their own and those of others);
- responsible for themselves, responsive to and respectful of others;
- reflective as learners, developing their ability to learn;
- innovative and equipped for new and further challenges;
- engaged intellectually and socially, ready to make a difference.

The major focus of this syllabus is to promote an appreciation of agriculture as an applied science and vocational programme that will allow learners to explore existing agricultural/ scientific knowledge, skills and attitudes acquired from the study of science and other subjects to address environmental and social economic issues in their day to day lives. The knowledge and skills acquired from the syllabus will contribute directly to the development of the skills and abilities such as communication; information handling skills; numeric skills; problem-solving skills; social and cooperative skills; critical and creative thinking; and initiative and independence.

Learners will also develop the ability to apply scientific skills; principles; methods and demonstrate their appreciation of agriculture as a profitable business to the individual, community; nation; the region (Southern African Development Countries) and globally.

1.2 SYLLABUS CONTENT AT A GLANCE

The content of this syllabus is designed to encourage a broad, applied and practical science-based study of agriculture. It includes:

1. General agriculture including principles of land use and agricultural economics.
2. Soil formation, soil types and features, fertility, erosion, conservation, drainage and irrigation of soil, as well as the water cycle.
3. Principles of plant growth, photosynthesis, transport of materials, reproduction and germination.
4. Water sources, drainage and irrigation
5. Crop production including preparation of land and cash crop production.
6. Crop protection including weed, pest and disease control as well as the use of farm chemicals.
7. Livestock anatomy and physiology of ruminant and non-ruminant digestion as well as mammalian reproduction.
8. Livestock production and health for ruminant and non-ruminant animals and birds including housing, and nutrition.
9. Pasture management, intensive and extensive systems.
10. Livestock and crop breeding including genetics and selective breeding.
11. Farm structures and tools, fencing, buildings, water supply, tools and machinery.

1.3 Assessment at a glance

The syllabus will be assessed in two ways that is theory and coursework.

Paper 1 Theory

1 hour 45 minutes

This paper has two sections

Section A: consists of compulsory, short, structured question worth 70 marks

Section B: Candidates answer two out of five free response questions. Each question is worth 15 marks.

Total marks : 100

Weighting: 70%

Paper 2: Teacher assessed Coursework- testing practical and investigatory skills

Coursework assessment marked by teacher and moderated by Examination Council of Lesotho. Detailed instruction for teacher assessment will be available from Examinations Council of Lesotho.

When planning practical work, teachers should make sure they do not contravene any school, Education authority and Examinations Council of Lesotho regulations.

Total marks : 90 (Practical skills 60, investigatory skills)

Weighted: 30 (Practical skills 20%, investigatory skills 10%)

2. SYLLABUS AIMS AND ASSESSMENT OBJECTIVES

2.1 AIMS

The syllabus aims to:

1. promote an appreciation of agriculture as an applied science;
2. stimulate an interest in, and create an awareness of existing problems and opportunities in agriculture;
3. stimulate positive attitudes by showing that efficient farming can be a profitable and rewarding occupation;
4. demonstrate the value of agriculture to the family and community, so as to show how improved agriculture can contribute to the worldwide campaign for freedom from hunger;
5. encourage the teaching, in a practical manner, of basic principles and skills in agriculture and of efficient farm business management;
6. ensure that school takes an active part in rural development by integration of agricultural activities into the school curriculum;
7. harness and conserve essential agricultural indigenous knowledge and experiences in order to promote biodiversity;
8. encourage the development of practical areas, ensuring that learners actively participate in the farming event throughout the course, including weekend and during school holidays;
9. develop initiative, problem solving abilities, scientific methods and self-education so as to encourage resourcefulness and self-reliance;
10. enhance practical and vocational skills in entrepreneurial competencies and self- reliance for sustainable development;

11. provide a basis, together with the basic science and mathematics, for more advanced studies in agriculture.

2.2 ASSESSMENT OBJECTIVES

There are three assessment objectives that describe the knowledge, skills and abilities that candidates are expected to demonstrate at the end of the course. They reflect those aspects of the aims that will be assessed.

AO1 Knowledge with understanding

Candidates should be able to demonstrate agricultural knowledge and understanding in relation to the correct use of:

1. facts, concepts, principles pattern, models and theories
2. terms, symbols, quantities and units
3. the techniques, procedures and principles of safe agricultural practice

The subject content defines the factual knowledge that the candidates may be required to recall and explain. Questions testing these objectives will often begin with one of the following words: *define, state, name, describe, explain or outline.* (See the glossary at the back of this syllabus)

AO2 Handling information, application and problem solving

Candidates should be able - using oral, written, symbolic, graphical and numerical forms of presentation to:

1. locate, select, organise and present information from a variety of sources;
2. translate information to identify patterns, report trends and draw inferences;
3. use information to identify patterns, report trends and draw inferences;
4. present reasoned explanations for phenomena, patterns and relationship
5. make predictions and propose hypothesis
6. solve problems, including some of a quantitative nature

These assessment objectives cannot be precisely specified in the content because questions testing such skills may be based on information that is unfamiliar to the

candidates. In answering such questions, candidates are required to use principles and concepts that are within the syllabus and apply them in a logical, reasoned or deductive manner to a novel situation. Questions testing these objectives will often begin with one of the following words: discuss, predict, suggest, calculate, or determine. (See the glossary of terms in the appendix).

AO3 Practical skills and investigations

Candidates should be able to:

1. use and organize techniques, apparatus and material; use and organize techniques, apparatus and materials;
2. observe, measure and record;
3. interpret and evaluate experimental observations and data;
4. plan and carry out investigations (and, where appropriate, make predictions and propose hypothesis).

3. ASSESSMENT GUIDE AND DESCRIPTION OF PAPERS

3.1 Relationship between assessment objectives and components

The approximate weightings to each of the assessment objectives are summarised in the table below.

ASSESSMENT OBJECTIVE	APPROXIMATE WEIGHTING
AO1: Knowledge with understanding	30%
AO2: Handling information and problem solving	40%
AO3: Experimental skills and investigations	30%

Teachers should take note that there is greater weighting of 70% for skills (including handling information, problem solving, practical, experimental and investigation skills) than for knowledge and understanding. Teachers' scheme of work and sequence of learning activities should reflect this balance, so that the aims of the syllabus may be met, and the candidates are fully prepared for assessment.

3.2 Assessment Grid/Specification

ASSESSMENT OBJECTIVE	Paper1 (marks)	Paper 2 (marks)
AO1: Knowledge with understanding	43	0
AO2: Handling information and problem solving	57	0
AO3: Experimental skills and investigations	0	90

3.3 GRADE DESCRIPTIONS

Criteria for the standard of achievement likely to have been shown by candidate awarded Grades **A**, **C**, and **F** are shown below. The standard of achievement required for the award of Grade **C**, include the criteria for Grade **F**. Similarly, the standard of achievement required for the award of Grade **A** includes criteria for Grade **C**.

Grade A candidate should be able to:

- relate facts to principles and theories and vice versa
- state why particular techniques are preferred for a procedure or operation
- select and collect information from a number of sources and present in a clear, logical form
- solve problems in situations that may involve wide range of variable
- process data from a number of sources to identify patterns and trends
- generate a hypothesis to explain facts, or find facts to support a hypothesis

Grade C candidate should be able to:

- link facts to situations not specified in the syllabus
- describe the correct procedure(s) for a multi-stage operation
- select a range of information from a given source and present it in a clear, logical form
- identify patterns or trends in given information
- solve problems involving more than one step, but with a range of variables

- generate a hypothesis to explain a given set of facts or data

Grade F candidates should be able to:

- recall facts contained in the syllabus
- indicate the correct procedure for a single operation
- select and present a single piece of information from a given source
- solve problems involving one step or more one step if structured help is needed
- identify a few patterns or trends where minor manipulation of data is needed
- recognize which of two given hypotheses explains a set of facts or data

4. SYLLABUS CONTENT

4.1 General Agriculture

Content

- 4.1.1 Trends in agriculture and farming practices
- 4.1.2 Forms of land use
- 4.1.3 Principles of land use and agricultural economics

Learning Outcomes

Candidates should be able to:

- a) outline trends in agriculture from hunting to commercial farming including developmental stages : hunting and gathering→ domestication→ shifting cultivation and pastoral nomadism → settling→ intensive and extensive production, subsistence, commercial and cash cropping (brief outline);
- b) describe different forms of land use, including different agricultural systems and farming practices (rotations, mixed farming and monoculture), forestry and aquaculture;
- c) outline different forms of land use and explain their importance in agriculture;
- d) describe and explain the ways in which the uses of land in different areas may be limited by topographical, climatic and other environmental factors;
- e) understand that population growth leads to a need for efficient use of land and farm planning;
- f) describe organic production, hydroponics, genetically modified (GM) crops, animals, birds and be able to discuss arguments for and against the use of GM crops, animals, birds and organic production;
- g) explain the principles of supply and demand, diminishing returns, opportunities and choices facing the farmer, decision- making based on understanding of economic factors.

4.2 Soil

Content

- 4.2.1 Soil formation
- 4.2.2 Soil types, composition, texture, structure and temperature
- 4.2.3 Soil fertility
- 4.2.4 Soil erosion and soil conservation
- 4.2.5 Drainage

Learning Outcomes

Candidates should be able to:

- (a) explain soil formation from parent material by physical, chemical and biological agents of weathering;
- (b) describe soil profile in terms of topsoil, subsoil and underlying materials;
- (c) describe soil texture in terms of different sizes of soil particles, sand, silt and clay;
- (d) describe different soil types (loam soils and clay soils) and their properties, including water-holding capacity, drainage and aeration;
- (e) understand soil structure, including the importance of forming and maintaining a good crumb structure, the effects of humus and maintenance of organic matter in the soil, oxidation of organic matter and the loss of soil structure causing capping and soil pans;
- (f) outline soil constituents in terms of mineral matter, organic matter, air, water (free or gravitational water, capillary and hygroscopic water) and living organisms (bacteria, nematodes, fungi and earthworms);
- (g) understand the influence of soil temperature on the rate of plant growth, the danger of excessive heat to young seedlings and the danger of frost to some crops, and the methods of reducing the effect of extreme temperatures by mulching of seedbeds and shading of transplanted seedlings;
- (h) explain the importance of the following nutrients to soil fertility and describe the signs and effects of their deficiency in plants: major nutrients—compounds of nitrogen, phosphorus, potassium, calcium, magnesium and sulfur; minor (trace) nutrients: iron, boron and manganese;
- (i) carry out practical soil sampling and tests for soil pH;
- (j) describe the nitrogen cycle and its importance to soil fertility;
- (k) explain the importance of legumes and the use of organic fertilizers (manure and compost) in maintaining good soil structure and fertility;
- (l) describe the use of inorganic fertilisers (limited to **one** example for each of fertiliser containing predominantly phosphorus and predominantly potassium and **one** example of a compound fertiliser) in maintaining soil fertility;
- (m) explain how fertilizing practices and liming can affect soil pH;
- (n) describe types of soil erosion, their causes, agents, prevention and control;

- (o) describe drainage as movement of gravitational water down through the soil and understand the drainage of waterlogged land by means of ditches and the loss of plant nutrients due to leaching
- (p) understand the effects of poor drainage on soil organisms and root respiration;

4.3 Principles of Plant Growth

Content

- 4.3.1 Structure of plants including monocotyledons and dicotyledons
- 4.3.2 Movement of materials through plants
- 4.3.3 Reproduction in plants
- 4.3.4 Germination

Learning Outcomes

Candidates should be able to:

- (a) describe the distribution and function of root tissues and the structure and function of root hairs;
- (b) explain the absorption of plant requirements from the soil, including the principles of diffusion, osmosis, the passage of water and dissolved mineral salts through vascular tissues;
- (c) explain how the structure of a leaf is related to function (cellular detail is not required);
- (d) outline gas exchange by diffusion through the stomata;
- (e) describe photosynthesis in terms of carbon dioxide, water, light and chlorophyll leading to the synthesis of carbohydrates and the production of oxygen;
- (f) describe the distribution and function of tissues in a stem (dicotyledonous);
- (g) define translocation in terms of the movement of synthesised food to storage organs and explain the principles of modification of different parts of plants to form food storage organs and the types of food materials stored;
- (h) explain transpiration in terms of the transpiration stream, loss of water by evaporation and diffusion of water vapour through stomata;
- (i) describe the effects of temperature, humidity, wind and light intensity on the rate of transpiration;
- (j) define sexual reproduction;
- (k) describe the structure and functions of the flowers of a maize plant and of a bean plant;

- (l) define pollination;
- (m) describe the process of fertilization in a **named** plant;
- (n) describe how seeds and fruits are dispersed and explain the importance of dispersal in relation to weed control;
- (o) describe a sexual reproduction from stem tubers (e.g. Irish potato and yam) and from stem cuttings (e.g. sweet potato, cassava and sugarcane);
- (p) describe seed structure and the germination of maize and bean (or other legume) and understand the conditions required for germination.

4.4 Water sources, drainage and Irrigation

Content

- 4.4.1 Main sources of water supply in Lesotho to include the importance of the water cycle in agriculture
- 4.4.2 Distribution and supply of water for agriculture
- 4.4.3 Irrigation and conservation of water
- 4.4.4 Importance of soil drainage and irrigation
- 4.4.5 The water cycle

Learning Outcomes

Candidates should be able to:

- (a) name the main sources of water to include aquifer, surface wells river abstraction, reservoirs, rain catchment;
- (b) explain the advantages and disadvantages of different sources of water supply to include aquifer/well water, bore holes river and stream water, lake and reservoirs;
- (c) outline how water is treated to include sedimentation, flocculation, filtration and chlorination;
- (d) describe different methods of irrigation and compare their advantages and disadvantages;
- (e) outline methods of conserving soil water to include cover crops shading, mulching, minimum tillage;
- (f) describe different methods in which soils can be drained including advantages and disadvantages of each method;
- (g) explain the importance of managing water run-off from farmland
- (h) explain the need for irrigation and describe methods of irrigation with the effects on crop yield and quality (details of irrigation programmes for individual crops and of equipment specification are **not** required);
- (i) describe and understand the significance of the water cycle and underground water resources.

4.5 Crop Production

Content

4.5.1 Site selection

4.5.2 Land preparation

4.5.3 Cultivation of crops and fruit trees

Learning Outcomes

Candidates should be able to:

- (a) describe good aspects of site selection for crop production and fruit trees;
- (b) describe land preparation by stumping and clearing and soil preparation by primary and secondary cultivations by hand or machine (e.g. ploughing or digging, harrowing or raking);
- (c) name the main types of crop found locally (legumes, roots and tubers, edible fruits and cereals) and their products;
- (d) describe in detail the cultivation of one crop of local importance and fruit in relation to:
 - soil and climatic requirements
 - soil preparation
 - sowing or planting time and method
 - choice of suitable cultivars
 - seed rate and spacing
 - rates of application of fertilizer and manure
 - prevention and control of common pests, weeds and diseases
 - recognition of crop maturity
 - harvesting, yield and storage
 - record keeping (including a diary of events and production) and marketing.

4.6 Crop Protection

Content

- 4.6.1 Weed control
- 4.6.2 Pest control
- 4.6.3 Disease control
- 4.6.4 The use of farm chemicals and indigenous technologies

Learning Outcomes

Candidates should be able to:

- (a) identify and name three local weed species of a crop and describe their harmful effects and their modes of spread;
- (b) explain methods of weed control including cultural, mechanical and chemical methods;
- (c) describe the life cycle, effect and method of spread of one pest from each of the following:
 - biting and chewing pests (e.g. grasshoppers, locusts, termites, leaf miners and beetles)
 - piercing and sucking pests (e.g. aphids, Bagrada bugs, mealy bugs and scale insects)
 - boring pests(e.g. weevils, stalk borer and American bollworm (*Helicoverpa armigera*));
- (d) name and describe the mode of action of chemical controls for pests including contact pesticides and systemic pesticides and understand the appropriate use of these pesticides in controlling pests in the groups listed above;
- (e) describe biological and biotechnical methods of controlling pests;
- (f) describe methods of cultural pest control including rotation and catch cropping;
- (g) describe the mode of infection, harmful effects, prevention and control of one named plant disease from each of the following groups: bacterial diseases, fungal diseases and viral diseases not in detail;
- (h) explain the importance and methods of safe storage handling of farm chemicals, including the use of specifically designed protective clothing, correct dilution and mixing, precautions before, during and after application and avoidance of pollution when cleaning spraying equipment;
- (i) explain the importance of safe storage of farm chemicals to include chemicals that are toxic, e.g. herbicides, insecticides and flammable, e.g. fuels.

4.7 Livestock Anatomy and Physiology

Content

4.7.1 Digestive systems

- Ruminants
- Non-ruminants
- birds

4.7.2 Reproductive system

- Male
- Female

Learning Outcomes

Candidates should be able to:

- (a) describe the structure and function of the digestive system of a ruminant, non-ruminant and a bird (simple outline of organs through which food passes; reference to specific enzymes is not required);
- (b) describe the processes of digestion and absorption in the alimentary canals of a ruminant and a non-ruminant (reference to specific enzymes is not required);
- (c) describe the reproductive systems (male and female) of a named mammalian farm animal, bird ;
- (d) describe the processes of fertilization and birth in a named mammalian farm animal, birds;
- (e) define *weaning* and *lactation* and understand the importance of colostrum.

4.8 Livestock Production and Health

Content

4.8.1 livestock housing

4.8.2 livestock nutrition

4.8.3 livestock rearing

4.8.4 livestock health

4.8.5 Study one ruminant, one non-ruminant and a bird with particular reference from (a) to (l) below:

Learning Outcomes

Candidates will be able to:

- (a) describe suitable housing and conditions for livestock;
- (b) describe the care and rearing of young stock;
- (c) describe the nutritional requirements (including food materials, their nutritional content and signs of deficiency) and feeding practices (including importance of a balanced ration suited to the age and stage of development of the livestock);
- (d) outline the meaning of the terms *maintenance ration and production ration*;
- (e) explain the importance of an adequate, clean water supply;
- (f) demonstrate the stockmanship, including care in the handling of animals and birds, record keeping, including a diary of events and production records;
- (g) Recognize the signs of good health and ill-health in livestock
- (h) Explain the ways in which infectious and contagious diseases are spread;
- (i) Explain the problems caused by parasites;
- (j) Explain the life cycle of a parasite of local importance;
- (k) Explain what is meant by the terms *notifiable/scheduled diseases*;
- (l) *Explain the role of antiseptic and antibiotics in prevention and control of diseases;*
- (m) Explain the importance of livestock hygiene and the isolation of sick animals.

4.9 Range and Pasture Management

Content

4.9.1 Principles of range and pasture management

4.9.2 Extensive pasture management

4.9.3 Intensive pasture management

Learning Outcomes

Candidates should be able to:

- (a) describe the vegetation of grazing lands, including grasses and legumes for grazing and bushes for browsing;
- (b) describe how improved pastures can be established;
- (c) explain what is meant by rotational grazing, paddock and zero grazing, intensive and extensive grazing;
- (d) describe extensive management methods, including the importance of stocking rates, carrying capacity and the dangers of overstocking, bush control and the use and misuse of fire;
- (e) explain how pasture utilization can be improved by fencing and rotational grazing.

4.10 Livestock and Crop Breeding

Content

4.10.1 monohybrid inheritance

4.10.2 selective breeding in animals and crops

Learning Outcomes

Candidates should be able to:

- (a) define the terms *chromosome*, *gene*, *allele*, *homozygous*, *heterozygous*, *dominant and recessive*;
- (b) calculate and predict the result of simple genetic crosses involving 1:1 and 3:1 ratios;

- (c) explain the meaning of *genotype and phenotype* and their importance in animal and plant breeding;
- (d) describe how breeding can improve yield, disease resistance, hardiness and appearance in livestock and crops;
- (e) understand the role of artificial selection in the production of improved varieties of animals and plants of economic importance;
- (f) understand the benefits of artificial insemination and embryo transfer/transplant;
- (g) understand the differences between selective crop breeding and genetically modified (GM) crops and livestock.

4.11 Farm Structures and Machinery Content

4.11.1 Fencing

4.11.2 Farm buildings

4.11.3 Structures for farm water supply

4.11.4 Farm tools and implements

4.11.5 Farm machinery

Learning Outcomes

Candidates will be able to:

- (a) describe the treatment of fencing posts, methods of fence construction, types of fence suitable for different purposes, the use of hedges and windbreaks;
- (b) outline the properties and uses of wood, concrete blocks, metal, stone, brick, earth and thatch in the construction of farm buildings;
- (c) list suitable sources of water for human consumption, livestock and for irrigation;
- (d) outline suitable methods of construction of storage dams to resist water pressure, which increases with depth;
- (e) describe the construction and use of storage tanks, the distribution of water through pipe systems and simple plumbing, sufficient for maintaining a plastic pipe system, including pipe-joining and fitting of tap washers, water pumps;

- (f) describe the use and maintenance of saw, hammer, screwdriver, file, spanner, sprayer and hand tools for cultivation, sprayers;
- (g) explain the advantages and disadvantages of farm mechanisation;
- (h) describe the use and maintenance of mould-board plough, cultivator, harrow, planter and ridger (either animal or tractor-drawn).

5. COURSEWORK

5.1 Introduction

Paper 2 is a teacher-assessed continuous assessment of the candidate's practical work. The agriculture teacher, who is responsible for allocating marks, is required to submit the complete schedule of all marks for the purposes of moderation.

The number of marks available for the assessment of practical work during the course is 90 marks. There are four practical exercises which test practical skills. Together these are worth 60 marks. There is one practical investigation which tests investigatory skills. This is worth 30 marks.

Practical work assesses skills and abilities essential to the study of agriculture that are not suitably measured by the examinations. All candidates must complete practical exercises and an investigation.

It is the responsibility of the teacher to ensure that the work planned is safe and legally permitted by local legislation. It is recommended that a simple risk assessment be carried out by the teacher for each of the practical tasks and investigations to ensure that the health and safety of the candidates is not put at risk by the planned activities.

Internal moderation of coursework (where there is more than one teacher assessing)

Internal moderation is not required when there is only one group of candidates assessed by a single teacher. In this case it is the teacher's marks that are submitted.

When several teachers in a Centre are involved in internal assessments, arrangements must be made within the Centre for all candidates to be assessed to a common standard. It is essential that, within each Centre, the marks for each skill assigned with in different teaching groups (e.g. different classes) are moderated internally for the whole Centre entry. The Centre assessment will then be subject to external moderation.

External moderation of coursework (required for all Centres)

The centres are required to submit for moderation the following:

- Individual Candidate Record Card
- Individual candidate portfolio containing evidence of the four practical exercises
- Individual candidate investigative project
- Coursework Assessment Summary Forms,
- Centre authentication form

The deadline for submission of the above documents is end of October every year. Examples of forms are shown in Section 6.5.

5.2 Paper 2 Practical Coursework

The practical work carried out by candidates should be assessed by the agriculture teacher. This entails keeping a record for all the candidates, showing the operations carried out and the marks awarded.

Practical exercises:

Much essential 'fieldwork' in agriculture has no written component but, clearly, credit should be given for practical ability. At least four discrete practical exercises involving Assessment Objective AO3 (see section 3.2) should be assessed over the course.

Each practical exercise should be assessed according to the criteria stated in section 5.2.3. Ideally these exercises should be set on the different sections of the syllabus. A maximum of three of these exercises may be set as part of the longer practical investigation exercise. See section 5.2.6. Teachers may wish to combine up to three of the practical exercises with the practical investigation in this way. Other teachers may prefer the simplicity of keeping the two parts of the assessment separate.

The four or more individual practical exercises involving Assessment Objective AO3 should be spread out through the course in a way that suits the teacher and the course structure. The dates on the evidence should make clear when the work has been done so that confirmation is provided that the work has been done at different points in the course. Spreading out the assessments could be done, for example, by ensuring that at least one discrete practical exercise is assessed in each of four terms of study.

5.2.1 Examples of tasks suitable for the practical exercises

Imaginative teachers and candidates will find that almost any agricultural task or activity can be used as a basis for the assessment of practical skills through the practical exercises. Such tasks may be carried out in almost any agricultural context, from school or college farms, through allotments and backyard chicken or beekeeping to extensive forestry or cattle ranching.

It is essential that the candidates have sufficient opportunity to acquire and practice the skills to be assessed before the assessment so that they can

confidently show what they can do. This is particularly true where animals are involved so that candidates have been properly trained in dealing with the animals, both for their own safety and also to ensure the humane treatment of the animals concerned. The purpose of this assessment is to give a positive reward for the skills that have been acquired by candidates, so it is very important to ensure that this purpose is met by making sure that candidates have been properly prepared for the intended assessment.

Tasks associated with crop production

The tasks may involve manual tasks (e.g. digging with a spade or hoe) or mechanized or animal-powered tasks (e.g. ploughing) or a combination of these.

The following are examples of tasks that will prove suitable, but clearly this is not exhaustive.

- digging with a spade or hoe to produce a rough tilth
- ploughing with a hand-drawn, animal-drawn or tractor-drawn plough
- preparation of a seed bed using hoes, rakes or mechanical cultivators or Tractor-drawn cultivators and horrows
- seed sowing (by hand, drills left open for checking depth and spacing; or tractor drawn-drill, settings of drill left for checking)
- fertilizing (calculation of quantities, placement, topdressing)
- transplanting and shading
- mulching
- weeding by hand, using a hoe or flame gun
- pruning
- crop protection (spraying, pest and disease control)
- harvesting and storage of crops

Tasks associated with livestock/poultry production

The animals involved may be conventional livestock, poultry or any other agricultural animal production (e.g. bees, farmed fish or rabbits). The tasks may be manual (e.g. removing soiled bedding and replacement with clean material) or mechanized (e.g. herding using a quad-bike, milking using a mechanical milking parlour) or a combination of these.

The following are examples of tasks that will prove suitable. Again, this is not a list of all the possibilities (and the bracketed sections beginning 'including...' are not comprehensive lists of all the activities that might make up the task, and the task selected might not include all of the listed activities).

- herding (including keeping the herd together; avoiding predators; ensuring access to food and clean water)
- tending animals in any enclosure (e.g. field, chicken run or house) (including ensuring access to food and water; dealing with waste; providing clean bedding; measures to minimise the risk of disease)

- enclosure and house maintenance (including fence construction or maintenance; hedge planting or maintenance; construction, routine maintenance, repair, cleaning or disinfection of housing, pens and nest boxes)
- Dealing with disease (including measures to avoid disease, identification of diseased animals, isolation, appropriate treatment where possible [e.g. application of oil to poultry infected with scaly leg mite], disinfection of housing; deciding when to ask for advice [e.g. from an experienced farmer or veterinarian])
- husbandry (including selection of animals suitable for breeding, care for breeding animals, preparations for nesting birth or hatching, supervision of birthing or hatching, care of new-born or newly hatched animals, deciding when to ask for advice)
- obtaining the product (including milking; collection, grading, cleaning and preparation of eggs for consumption or sale; humane preparations for taking stock to market)

5.2.2 Evidence of performance of practical exercises

The practical exercises will involve candidates in tasks and activities in which they demonstrate skills which will be assessed and will generate evidence of the demonstration of the skills for moderation in the form of practical exercise portfolios.

Assessment of the practical exercises by the teacher needs to take place at the time of the performance of the skill by the candidate in order to ensure that the assessment is authentic. The teacher may well use tick-sheets, notes or other teacher-dated records to document the assessment, for later transfer onto the mark sheets. However these tick-sheets and teacher-dated records **do not provide evidence** of the candidate's performance that is suitable for moderation since such evidence should show the candidate performing the task or activity.

The evidence for moderation of the practical exercises can take many forms. In each case evidence will form the practical exercise portfolio, what is being sought is authentic evidence that shows that the candidate has carried out the various chosen practical tasks or activities. The evidence should show that the candidate has skills in such practical agricultural work, and also when the work was carried out.

Authentic records generated during candidate activities must include the date when the practical activity was carried out and may include:

- Photographs of the candidate doing the task or activity. The images must clearly show the individual candidate carrying out the skill being assessed. These images may be presented in any convenient form (e.g. jpeg, gif or bmp) or in a document or presentation with written or audio annotations referring to the skills, by the candidate, as well as their thoughts about their own performance of those skills (critical reflections).
- Short videos of the candidate carrying out the tasks or activities. No editing or titles are required but candidates should add annotations and critical reflections as an audio or written commentary. Any common format is suitable (e.g. avior mpeg).
- Original diaries or notes recording the candidate's carrying out of the tasks and activities. These must not be edited or written up neatly. They should be the authentic records kept by the candidate of the skills, and critical reflections, at the time of doing the task or activity. These should be scanned or clearly photographed for inclusion on the USB flash stick, CD or DVD disk.

For each practical exercise some visual evidence must be submitted. This should be in the form of an annotated photograph or a simple drawing/sketch to show the exercise performed. A brief critical reflection /evaluation should include statements about:

- Objectives of the practical exercise
- What went well
- Problems encountered in performing exercise
- How the exercise might be improved in the future

The preferred forms of evidence are those generated by the candidate and those showing the candidate carrying out the work and are most conveniently presented on a USB flash stick or CD or DVD disk or hand written. The evidence for the entire sample of candidates for moderation may fit on a single flash stick or disk. This is acceptable as long as it is very clear which evidence belongs to which candidate, e.g. by putting the evidence for different candidates into different folders, labeled with the candidate number and name. *This evidence will form the practical exercise tasks portfolios along with the Investigation project*

5.2.3 Criteria for the assessment of practical exercises

Each practical should be marked using the following criteria

1. Responsibility:	the ability to assume responsibility for the task in hand and to work from given instructions without detailed supervision and help.
2. Initiative:	the ability to cope with problems arising in connection with the task, to see what needs to be done and to take effective action.
3. Technique:	the ability to tackle a practical task in a methodological, systematic way and to handle tools skillfully and to good effect.
4. Perseverance:	the ability to see a task through to a successful conclusion with determination and sustained effort.
5. Quality:	the ability to attend to details so that the work is well finished and is well presented.

5.2.4 Guide for marking the practical exercise criteria

1. Responsibility	Mark
<ul style="list-style-type: none"> • Follows written or verbal instructions without the need for help • Carries out appropriate safety procedures • Assumes responsibility easily and leads in group work 	3
<ul style="list-style-type: none"> • Follows written or verbal instructions with a little help • Is aware of the need for safety procedures but has difficulty recognizing them without guidance • Shows responsibility for the work 	2
<ul style="list-style-type: none"> • Follows written or verbal instructions with considerable help • Shows little regard for safety procedures ,even when told • Shows some responsibility for the work 	0-1
2. Initiative	
<ul style="list-style-type: none"> • Offers solutions or explanations to unexpected problems • Recognises, and is able to anticipate, problems • Solves problems without help • Comments on imperfections of experimental methods or results 	3
<ul style="list-style-type: none"> • Offer solutions or explanations to unexpected problems after seeking advice • Solve problems without help • Recognizes faults in experimental methods, given some pointers 	2
<ul style="list-style-type: none"> • Is uncertain how to proceed and requires considerable help • Recognises only the most obvious errors in experimental methods after considerable guidance 	0–1

3. Technique	Marks
<ul style="list-style-type: none"> Approaches tasks methodically and systematically Handles tools/apparatus skillfully and confidently Carries out practical procedures with dexterity 	3
<ul style="list-style-type: none"> Handles tools/apparatus effectively Carries out practical procedures adequately 	2
<ul style="list-style-type: none"> Handles tools/apparatus clumsily Carries out practical procedures with difficulty 	0–1
4. Perseverance	Marks
<ul style="list-style-type: none"> Completes all the required practical tasks and attendant written work .Has a positive attitude and is well motivated 	3
<ul style="list-style-type: none"> Completes the required practical tasks and attendant written work with a little encouragement 	2
<ul style="list-style-type: none"> Does not complete the required practical tasks and attendant written work Is somewhat disinterested/impatient when carrying out work and is disinclined to repeat procedures 	0–1
5. Quality	Marks
<ul style="list-style-type: none"> Performs practical work thoroughly, pays attention to detail and produces a very good final result Produces accurate, clear and neatly presented written portfolio 	3
<ul style="list-style-type: none"> Performs practical work thoroughly for the most part and produces a satisfactory to good result Produces mostly accurate and clearly presented written portfolio 	2
<ul style="list-style-type: none"> Performs practical work in a rushed and superficial way and shows little concern for the finished product Produces inaccurate and poorly presented written portfolio 	0–1

5.2.5 Practical Investigation

This should address the parts of Assessment Objective AO3 where candidates produce a hypothesis, plan and carry out an investigation. The data collected is recorded, analysed and conclusions made. A written report is required and the limitations of the investigation noted. This is assessed according to the criteria stated in section 5.2.9. The practical work done during this investigation can be organized in such a way as to constitute practical exercises which can be assessed as such. The candidates will carry out an investigation and write a report, not exceeding 1000 words. The teacher evaluates and marks the report and awards an overall mark out of 30.

5.2.6 The type of work required to test investigative skills

The main aim of the investigation is that it should be done by the individual candidate, in connection with some particular study problem. It should not be confused with the writing up of class work exercises.

Agriculture offers a wide scope for such projects, and it should not be difficult to find suitable topics, bearing in mind the following principles:

- (a) The work must be investigatory. Candidates must find the information for themselves by direct observation and measurement.
- (b) Though the programme of study must be carried out by the candidate, it is the teacher's responsibility to guide the candidate, or even to select problems that suit the candidate's investigatory abilities. The teacher may also suggest methods of investigation that are likely to be effective. Candidates are not research workers but, when given appropriate guidance, they can learn how to carry out investigations for themselves.
- (c) The nature of the problem to be investigated should be stated and discussed by the candidate in the introduction.
- (d) Time allocated to investigation work should be approximately 5 periods of 40 minutes, including home work. This should be enough to achieve a good standard. Candidates should be discouraged from spending so much time on their projects that their normal class work suffers.
- (e) Candidates will not necessarily solve all the problems they tackle, but they should make a worthwhile attempt to do so. When problems fail to yield positive results, candidates should be encouraged to discuss their actual findings and comment on the implications. Good investigation work by candidates often leads them to understand the difficulties and subtleties of the problem, and this can be very educational. For some candidates, negative results can be

depressing, and teachers must use their judgement when guiding them, so that they do not become discouraged.

5.2.7 Examples of acceptable investigations

Investigations can be based on a variety of topics. The following examples are intended as a guide, but teachers may wish to help their candidates to devise investigations of their own along similar lines.

Field experiments

- comparison of sowing depths, to discover effects; minimum, optimum and maximum depths
- thinning of root crops; no thinning, thinning to various spacing, effects upon total yield and size of roots produced
- plant population in relation to yield; spacing of plant station and rows, comparison to find optimum spacing
- spraying versus not spraying; effects on infestation with disease or pest organisms, effects on yield, cost-effectiveness
- top-dressing versus not top-dressing; various treatments and effects, comparison of costs and yields
- fertilizer trials; organic versus inorganic, effects of differing application rates upon yields, diminishing returns
- rationing of livestock feed versus ad-lib feeding; effects on production, cost-effectiveness
- effects of different levels of nutrition on young stock (e.g. broiler chickens); measurement of live weight gain under different rationing regimes, effects on health, cost-effectiveness

In the case of field trials, it is often useful to have a group of candidates involved, in order to make possible replication of treatments on plots in different parts of the garden or field. This improves the statistical accuracy of the trial. However, each candidate's contribution must be assessed and individual reports must be written.

When different treatments are tried, the effect upon *yield of produce* is often a factor to be measured. The *cost-effectiveness* of alternative treatments should also be worked out, to see which one is the most profitable.

Attention should be paid to the presentation of results in a clear and concise form, i.e. tabulation or graphical representation.

Reasons should always be given for treatments carried out, methods tried, or conclusions reached.

An example of how the practical exercises may be integrated within the practical investigation

A candidate has decided to carry out an investigation into the effect of nitrate fertilizer on the yield of cabbages. Having proposed a hypothesis with

the scientific reasons behind it and planned a suitable investigation, the practical work is carried out. The first practical assessment could involve the preparation of the soil seed bed. The second assessment could involve the planting and spacing of cabbages and the application of nitrate fertiliser. The third assessment could involve harvesting and measuring the cabbage yield. The recording of the data, subsequent analysis and limitations are then written up as part of the practical investigation.

5.2.8 *The degree of guidance by the teacher*

This calls for skill on the part of the teacher. Ideally, the candidate should be free to choose a topic for the investigation and to decide on the methods to be used. In practice, the candidate will need help, because of inexperience. The teacher should never leave the candidate in doubt for long about what to do next, so that the candidate does not lose interest in or enthusiasm for the investigation.

5.2.9 *The layout of the investigation report*

Title: The report should have a clear title. This should appear on the first page, together with the name of the candidate and the name of the school.

Contents: A list of contents should be included, showing clearly the main sections of the report and the numbers of pages where they appear. Lists of tables, graphs and photographs can also be included, if appropriate.

Introduction: This should state the objective(s) of the investigation, the questions to be asked or a hypothesis, and describe briefly the plans for carrying it out. Sources of material, such as reference books or people interviewed, should be acknowledged. Details of the time (with dates) and the place where the investigation was carried out should be given.

Methodology: A description of the investigation. Relevant details of the methods used to plan, sample, measure, collect and analyse data.

Presentation of data findings: Data collected should be presented in this section as tables, charts, graphs or histograms. They must always be labeled with a brief description of the data.

Findings and conclusions: The conclusions of the investigation should be summarized in a few paragraphs. The findings should be compared to the original plan set out in the introduction. Limitations of the data should be noted and suggestions made for improvements. Help received from other people should be acknowledged.

5.2.10 Criteria for the assessment of the practical investigation

The practical investigation should be marked using the following criteria:

Criteria	Marks available
1. The selection of relevant questions (hypothesis) for the investigation	5
2. The planning of the investigation and the principles on which it is based	5
3. The handling of evidence	5
4. The ability to make deductions from the evidence or the data acquired	5
5. The ability to recognise limitations of the investigation	5
6. Description of practical, presentation, layout and originality (candidate's own work)	5

5.2.11 Guide for marking against the investigation report criteria

1. The selection of relevant questions (hypothesis)for the investigation	Marks
Relevant questions (hypothesis) selected without guidance, appropriate and clearly stated	5
Relevant questions (hypothesis) selected without guidance, appropriate but poorly expressed	4
Relevant questions (hypothesis) selected with guidance, appropriate and clearly stated	3
Relevant questions (hypothesis) selected with guidance, appropriate but poorly expressed	2
Relevant questions (hypothesis) selected with considerable guidance	1
Relevant questions (hypothesis) provided for the candidate	0
2. The planning of the investigation and the principles on which it is based	Marks

Investigation well planned, without guidance, showing evidence that the relevant principles are understood	5
	4
Investigation adequately planned, with some guidance, relevant principles understood	3
	2
Investigation plan sketchy, plan produced with considerable guidance or no evidence that principles are understood	1
Investigation plan provided for the student	0
3. The handling of evidence	Marks
Results presented neatly and clearly in a table, appropriate method of analysis chosen, graphs and/or histograms accurate and correctly presented (i.e. correct scale, axis, 0 plot, labeling etc.)	5
	4
Results presented neatly and clearly in a table, inappropriate method of analysis chosen, graphs and/or histograms inaccurate and incorrectly resented	3
	2
Results not presented in a table, inappropriate method of analysis chosen, graphs and/or histograms inaccurate and poorly presented	1
	0
4. The ability to make deductions from the evidence or the data acquired	Marks
Comprehensive deductions based on the evidence, conclusions given with reasons	5
Several deductions based on the evidence, conclusions given with reasons	4
Few deductions based on the evidence, one conclusion given	3
Few deductions based on the evidence, no conclusions given	2
One deduction, no elaboration	1
Tasks carried out with considerable help, inaccurate observations and records	0
5. The ability to recognize limitations of the investigation	Marks
All major limitations identified, assessed and improvements suggested	5

	4
Several limitations identified, assessment superficial, no improvements suggested	3
	2
One or two limitations identified but no assessments or improvements given	1
	0
6. Description of investigation, presentation, layout and originality(candidate's own work)	Marks
Clear, full description of the aims and nature of the topic; work neat and well presented; Layout as required by the syllabus; candidate's own work	5
	4
Description of the aims and nature of the investigation given; lacking in either neat presentation or layout not as required by	3
	2
Outline only of the aims and nature of the investigation; poorly presented; layout not as required by the syllabus; candidate's own work	1
	0

The scheme of assessment is intended to encourage positive achievement by all candidates.

6.0 Appendix

6.1 Physical and chemical concepts and processes

For the purpose of assessment, candidates will be expected to demonstrate:

1. an understanding of temperature, pressure, evaporation and relative humidity;
2. an understanding of the terms *element*, *mixture*, *compound*, *atom*, *molecule* and *ion*;
3. an understanding of the terms *acid*, *base* and *pH value*;
4. an understanding of energy transfer/conversion.

6.2 Mathematical requirements

Calculators may be used in all parts of the assessment.

Candidates should be able to:

1. add, subtract, multiply and divide;
2. understand averages, decimals, fractions, percentages and ratios;
3. understand the relationship between surface area and volume;
4. use direct and inverse proportion;
5. draw charts and graphs, including histograms, from given data;
6. interpret charts and graphs;
7. select suitable scales and axes for graphs.

6.3 Terminology, units, symbols and presentation of data for agriculture

This section follows the practice laid down in the following documents:

- Association for Science Education booklet
Signs, Symbols and Systematics: The ASE Companion to 16–19 Science(2000)
- Institute of Biology
Biological Nomenclature, Standard terms and expressions used in the teaching of Biology(2000)

Candidates should be made aware of the information given in this section during teaching and practical work, as it will be used in examination papers.

6.3.1 Numbers

The decimal point will be placed on the line, e.g. 52.35.

Numbers from 1000 to 9999 will be printed without commas or spaces.

Numbers greater than or equal to 10 000 will be printed without commas. A space will be left between each group of three whole numbers, e.g. 4 256 789.

6.3.2 Units

The International System of units will be used (SI units). Units will be indicated in the singular not in the plural, e.g. 28 kg.

(a) SI units commonly used in agriculture

NB Care should be taken in the use of *mass* and *weight*. In many agricultural contexts, the term *mass* is correct, e.g. dry mass, biomass.

Quantity	Name of unit	Symbol for unit
length	Kilometre	km
	Centimeter	m
	Millimeter	cm
	micrometre	mm μm
mass	tonne(1000kg)	t
	kilogram	kg
	gram	g
	milligram	mg
	microgram	μg
time	year	y
	day	d
	hour	h
	minute	min
	second	s
amount of substance	mole	mol

(b) Derived SI units

Quantity	Name of unit	Symbol for unit
energy	kilojoule joule (calorie is obsolete)	kJ J

(c) Recommended units for area, volume and density

Quantity	Name of unit	Symbol for unit
area	hectare= 10^4m^2 square metre square decimetre square centimeter square millimetre	ha m^2 dm^2 cm^2 mm^2
volume	cubic kilometre cubic metre cubic decimeter (preferred to litre) litre cubic centimeter cubic millimetre	km^3 m^3 dm^3 dm^3 (not l) cm^3 mm^3
density	kilogram per cubic metre or gram per cubic centimetre or	kg m^{-3} g cm^{-3}

(d) Use of solidus

The solidus (/) will **not** be used for a quotient, e.g. m/s for metres per second.

6.3.3 Presentation of data

The solidus (/) is to be used for separating the quantity and the unit in tables, graphs and charts, e.g. time/s for time in seconds.

(a) Tables

- Each column of a table will be headed with the physical quantity and the appropriate SI unit, e.g. time/min.
- There are three acceptable methods of stating units, e.g. metres per sec *or* m per s *or* ms^{-1} .
- The column headings of the table can then be directly transferred to the axes of a constructed graph.

(b) Graphs

- The independent variable will be plotted on the x-axis (horizontal axis) and the dependent variable plotted on the y-axis (vertical axis).
- Each axis will be labeled with the physical quantity and the appropriate SI unit, e.g. time/min.
- The graph is the whole diagrammatic presentation. It may have one or several curves plotted on it.
- Curves and lines joining points on the graph should be referred to as 'curves'.
- Points on the curve should be clearly marked as crosses (x) or encircled dots (⊙). If a further curve is included, vertical crosses (+) may be used to mark the points.

(c) Pie charts

These should be drawn with the sectors in rank order, largest first, beginning at 'noon' and proceeding clockwise. Pie charts should preferably contain no more than six sectors.

d) Bar charts

These are drawn when one of the variables is not numerical, e.g. number of eggs of different colours. They should be made up of narrow blocks of equal width that do **not** touch.

(e) Column graphs

These are drawn when plotting frequency graphs from discrete data, e.g. frequency of occurrence of nests with different numbers of eggs. They should be made up of narrow blocks of equal width that do **not** touch.

(f) Histograms

These are drawn when plotting frequency graphs with continuous data, e.g. frequency of occurrence of stems of different lengths or chicks of different masses.

The blocks should be drawn in order of increasing or decreasing magnitude and they **should** be touching.

6.4 Glossary of terms used in science papers

During the moderation of a question paper, care is taken to ensure that the paper and its individual questions are, in relation to the syllabus, fair as regards balance, overall difficulty and suitability.

Attention is also paid to the wording of questions to ensure that it is as concise and as unambiguous as possible. In many instances, Examiners are able to make appropriate allowance for an interpretation that differs, but acceptably so, from the one intended.

It is hoped that the glossary (which is relevant only to biology, human and social biology and agriculture)

Will prove helpful to candidates as a guide (i.e. it is neither exhaustive nor definitive). The glossary has been deliberately kept brief not only with respect to the number of terms included but also to the descriptions of their meanings. Candidates should appreciate that the meaning of a term must depend, in part, on its context.

1. *Define* (the term(s) is intended literally, only a formal statement or equivalent paraphrase being required).
2. *What is meant by* (the term(s) normally implies that a definition should be given, together with some relevant comment on the significance or context of the term(s) concerned, especially where two or more terms are included in the question. The amount of supplementary comment intended should be interpreted in the light of the indicated mark value).
3. *State* implies a concise answer with little or no supporting argument (e.g. a numerical answer that can readily be obtained 'by inspection').
4. *List* requires a number of points, generally each of one word, with no elaboration. Where a given number of points are specified, this should not be exceeded.
- 5 (a) *Explain* may imply reasoning or some reference to theory, depending on the context. It is another way of asking candidates to give reasons for something. The candidate needs to leave the examiner in no doubt **why** something happens.
(b) Give a reason/Give reasons is another way of asking candidates to explain **why** something happens.
- 6 (a) *Describe*, the data or information given in a graph, table or diagram, requires the candidate to state the key points that can be seen in the stimulus material. Where possible, reference should be made to numbers drawn from the stimulus material.

- (b) *Describe*, a process, requires the candidate to give a step-by-step written statement of what happens during the process.

Describe and *explain* may be coupled, as may *state* and *explain*.

7. *Discuss* requires the candidate to give a critical account of the points involved in the topic.
8. *Outline* implies brevity (i.e. restricting the answer to giving essentials).
9. *Predict* implies that the candidate is not expected to produce the required answer by recall but by making a logical connection between other pieces of information. Such information may be wholly given in the question or may depend on answers extracted in an earlier part of the question. *Predict* also implies a concise answer, with no supporting statement required.
10. *Deduce* is used in a similar way to *predict* except that some supporting statement is required (e.g. reference to a law/principle, or the necessary reasoning is to be included in the answer).
11. *Suggest* is used in two main contexts (i.e. either to imply that there is no unique answer (e.g. in chemistry, two or more substances may satisfy the given conditions describing an 'unknown') or to imply that candidates are expected to apply their general knowledge to a 'novel' situation, one that may be formally 'not in the syllabus').
12. *Find* is a general term that may variously be interpreted as *calculate*, *measure*, *determine*, etc.
13. *Calculate* is used when a numerical answer is required. In general, working should be shown, especially where two or more steps are involved.
14. *Measure* implies that the quantity concerned can be directly obtained from a suitable measuring instrument (e.g. length, using a rule, or mass, using a balance).
15. *Determine* often implies that the quantity concerned cannot be measured directly but is obtained by calculation, substituting measured or known values of other quantities into a standard formula (e.g. the Young modulus, relative molecular mass).
16. *Estimate* implies a reasoned order of magnitude statement or calculation of the quantity concerned, making such simplifying assumptions as may be necessary about points of principle and about the values of quantities not otherwise included in the question.
17. *Sketch*, when applied to graph work, implies that the shape and/or position of the curve need only be qualitatively correct, but candidates should be aware that, depending on the context, some quantitative aspects may be looked for (e.g. passing through the origin, having an intercept, asymptote or discontinuity at a particular value).

In diagrams, *sketch* implies that a simple, freehand drawing is acceptable; nevertheless, care should be taken over proportions and the clear exposition of important details.

In all questions, the numbers of marks allocated are shown on the examination paper and should be used as a guide by candidates to how much detail to give. In describing a process, the mark allocation should guide the candidate about how many steps to include. In explaining why something happens, it guides the candidate to how many reasons to give, or how much detail to give for each reason.

6.5 ADDITIONAL INFORMATION:

6.5.1 Guide learning hours

Lesotho General Certificate of Secondary Education syllabuses are designed on the assumption that candidates have about 135 guided learning hours per subject over the week. ('Guided learning hours' include direct teaching and any other supervised or directed study time. They do not include private study by the candidate.)

However, this figure is for guidance only, and the number of hours required may vary according to local curricular practice and the candidates' prior experience of the subject.

6.5.2 Recommended prior learning

Candidates beginning this syllabus are expected to have studied Junior Certificate Agriculture previously.

6.5.3 Progression

LGCSE are general qualifications that enable candidates to progress either directly to employment, or to proceed to further qualifications.

6.5.4 Grading and reporting

LGCSE results will be shown by one of the grades A*, A, B, C, D, E, F or G, indicating the standard achieved, Grade A* being the highest and Grade G the lowest.

7.0 Assessment forms

7.1 Practical Exercise – Individual Candidate Card

7.2 Investigation – Individual candidate Card

7.3 Coursework Assessment Summary Form

AGRICULTURE – Practical Exercises
Individual Candidate Record Card

Please read the instructions printed on the following page and the General Coursework Regulations before completing this form.

Centre Number						Centre Name		November	2	0	1	5
Candidate Number						Candidate Name		Teaching Group/Set				

Brief description of Practical Exercises undertaken	1 Responsibility – following instructions	2 Initiative – coping with problems	3 Technique – tackling tasks systematically and skilfully	4 Perseverance – seeing a task through to the end	5 Quality – attending to detail	
Marks to be transferred to Coursework Assessment Summary Form	(max 12)	(max 12)	(max 12)	(max 12)	(max 12)	TOTAL (max 60)



Examinations Council of Lesotho

0179/ 02/CW/3/15

Instructions for completing individual candidate record cards

1. Complete the information at the head of the form.
2. Mark each Practical Exercise for each candidate according to instructions given in the Syllabus booklet.
3. Enter marks and total marks in the appropriate spaces. Complete any other sections of the form required.
4. Ensure that the addition of marks is independently checked.
5. **It is essential that the marks of candidates from different teaching groups within each Centre are moderated internally.** This means that the marks awarded to all candidates within a Centre must be brought to a common standard by the teacher responsible for co-ordinating the internal assessment (i.e. the internal moderator), and a single valid and reliable set of marks should be produced that reflects the relative attainment of all the candidates in the Coursework component at the Centre.
6. Attach this form to the candidate's Practical Exercises, **and retain until required for external moderation.** Further detailed instructions about external moderation will be sent in early October of the year of the Examination. See also the instructions on the Coursework Assessment Summary Form (0179/ 02/CW/3/15).
7. Transfer the marks to the Coursework Assessment Summary Form (0179/ 02/CW/3/14) in accordance with the instructions given on that document

**AGRICULTURE – Investigation
Individual Candidate Record Card**

Please read the instructions printed on the following page and the General Coursework Regulations before completing this form.

Centre Number						Centre Name		November	2	0	1	5
Candidate Number						Candidate Name		Teaching Group/Set				

Brief description of Investigation undertaken, comments on results, assessment and degree of guidance by teacher, etc.	Skills	Marks to be transferred to Coursework Assessment Summary Form
	1 Selection of questions (hypothesis)	/5
	2 Plan and principles of investigation	/5
	3 Handling evidence	/5
	4 Deductions	/5
	5 Recognition of limitations	/5
	6 Description of investigation	/5
TOTAL		(max 30)

Instructions for completing individual candidate record cards

1. Complete the information at the head of the form.
2. Mark each Practical Exercise for each candidate according to instructions given in the Syllabus booklet.
3. Enter marks and total marks in the appropriate spaces. Complete any other sections of the form required.
4. Ensure that the addition of marks is independently checked.
5. **It is essential that the marks of candidates from different teaching groups within each Centre are moderated internally.** This means that the marks awarded to all candidates within a Centre must be brought to a common standard by the teacher responsible for co-ordinating the internal assessment (i.e. the internal moderator), and a single valid and reliable set of marks should be produced that reflects the relative attainment of all the candidates in the Coursework component at the Centre.
6. Attach this form to the candidate's Practical Exercises, **and retain until required for external moderation.** Further detailed instructions about external moderation will be sent in early October of the year of the Examination. See also the instructions on the Coursework Assessment Summary Form (**0179/ 03/CW/3/15**).
7. Transfer the marks to the Coursework Assessment Summary Form (**0179/ 03/CW/3/14**) in accordance with the instructions given on that document.

Instructions for completing coursework assessment summary forms

1. Complete the information at the head of the form.
2. List the candidates in an order that will allow ease of transfer of information to a computer-printed Coursework mark sheet MS1 at a later stage (i.e. in candidate index number order, where this is known; see item B.1 below). Show the teaching group or set for each candidate. The initials of the teacher may be used to indicate group or set.
3. Transfer each candidate's marks from his or her Individual Candidate Record Cards (**0179/ 02/CW/3/14 and 0179/ 03/CW/3/14**) to this form as follows:
 - (a) Where there are columns for individual skills or assignments, enter the marks initially awarded (i.e. before internal moderation took place).
 - (b) In the column headed 'Total Mark', enter the total mark awarded *before* internal moderation took place.
 - (c) In the column headed 'Internally Moderated Mark', enter the total mark awarded *after* internal moderation took place.
4. Both the teacher completing the form and the internal moderator (or moderators) should check the form and complete and sign the bottom portion.

B. Procedures for external moderation

1. University of Cambridge International Examinations (Cambridge) sends a computer-printed Coursework mark sheet, MS1, to each Centre in early October showing the names and index numbers of each candidate. Transfer the total internally moderated mark for each candidate from the Coursework Assessment Summary Form to the computer-printed Coursework mark sheet MS1.
2. The top copy of the computer-printed Coursework mark sheet MS1 must be despatched in the specially provided envelope.
3. Cambridge will select a list of candidates whose work is required for external moderation. As soon as this list is received, send candidates' work with the corresponding Individual Candidate Record Cards, this Summary Form and the second copy of MS1, to Cambridge.
4. If there are ten or fewer candidates, all the Coursework that contributed to the final mark for all the candidates must be sent to Cambridge. Where there are more than ten candidates, Cambridge will select the candidates whose Coursework is required.
5. Photocopies of the samples may be sent **but** candidates' original work, with marks and comments from the teacher, is preferred.
6.
 - (a) The pieces of work for each skill should **not** be stapled together, nor should individual sheets be enclosed in plastic wallets.
 - (b) Each piece of work should be clearly labelled with the skill being assessed, Centre name, candidate name, and index number and the mark awarded.
7. Cambridge reserves the right to ask for further samples of Coursework.

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