

ENVIRONMENTAL AND LAND-BASED STUDIES

Unit 3: Plant management and care: feeding, growing, breeding, selecting and handling



Environmental and Land-based Studies

Level 2 Unit 3: Plant management and care: feeding, growing, breeding, selecting and handling

Sample scheme of work

This is an example of a scheme of work. You can adjust it or extract content to create a scheme of work to suit your delivery needs. It can also be adjusted by adding theory workshops to support learners who have/need additional learning time.

This unit is assessed through a centre set and marked assignment, which will be externally moderated.

Total GLH	60
Delivery model	Based on teaching three-hour sessions.
Aim	<p>Learners will gain an understanding of the management of plants and how the management programmes for plants can be affected by their intended use. Learners will develop the necessary skills to enable them to plan, implement and evaluate a plant management regime.</p> <p>Learners will also be able to debate the ethical issues surrounding plant breeding and care.</p>
Notes	<p>To ensure learners can complete the practical assessment for this unit, they will need to be able to work for a short period on their growing areas each week until the final report is written. Learners will need to be encouraged to review their plans at suitable stages and implement necessary changes with detailed evaluations.</p> <p>Assessment of LO4 will need to be carried out by the tutor over a period of practical sessions with supporting details recorded in the learners' diaries.</p> <p>This scheme of work has been written with the assumption that Unit 4 will cover the general principles of genetics before the topic is reached in this unit.</p> <p>The three functional skills units for ICT (use ICT appropriately, find and select information, and develop, present and communicate information) are abbreviated as follows: Use ICT, F&S ICT and DPC ICT.</p>

Topic	Activities, assignments, assessments	LO and AC	PLTS	FS	GLH	Resources and other comments
1 Plant biology, nutrition and plant types	<p>Recap plant biology that should have been covered in lower school. Ask learners to label and annotate the cross-section of a plant.</p> <p>Provide an overview of plant nutrition, the use of fertilizer and watering, and ensure learners fully understand photosynthesis.</p> <p>For the practical part of this session, set up flowerpots with a range of soil types and fertilisers. Learners will need to set up six flowerpots, each with a different soil type. Then place each different soil type in a different environment, eg by varying the amount of sunlight, water, etc. Learners should predict how the plants will grow.</p> <p>Discuss the effects of copper on hydrangeas, or pea–barley intercropping for efficient symbiotic N₂-fixation.</p>	AC1a, b AC2b	RL2 CT2 TW1	W1 SL1	3	Resources required: flowerpots and fertiliser.
2 Handling plants safely and monitoring techniques	<p>Arrange a visit to a local RHS garden. The tour should include some simple plant identification, safe tool use and the key considerations taken when planning new flowerbeds and care programmes.</p> <p>Discuss techniques to monitor commercial plant growth. Learners to produce a written report to evidence knowledge gained during visit.</p>	AC4a–c AC5b, c	CT2, 4	SL1	6	<p>Links to Unit 2: Working in the environmental and land-based sector.</p> <p>Introduce the assignment and discuss the brief and the requirements.</p> <p>Encourage learners to think about plants they would like to grow.</p>

Topic	Activities, assignments, assessments	LO and AC	PLTS	FS	GLH	Resources and other comments
3 Plant nutrition, soil testing and succession	<p>Arrange a visit to a local school that already has a developed horticultural area and preferably a wild plant area.</p> <p>Look at soil types and take samples from different areas. Follow with a group discussion on the plants that thrive best in the sampled soil types.</p> <p>Recap the learning on succession from Unit 1 and check learners' understanding. Using different sites within close proximity to each other, walk around and discuss the stages of succession present. Learners should produce a graphical map of the succession for each of the sites visited.</p> <p>To demonstrate their understanding of the principles of succession, ask learners to produce a leaflet detailing the soil types identified. For each soil type covered in the guide, learners must state one wild and one cultivated plant that would thrive in that soil type. This task can be started in class and completed as homework.</p>	AC1a, b AC2a	CT4 SM2, 3 IE4	W1, 4–6 R1, 2	3	<p>Resources required: soil testing kits, temperature and pH probes.</p> <p>Links to Unit 1: Environmental influences upon ecosystems and environmental and land-based production enterprises.</p>
4 Soil types	<p>Provide a range of soil types for learners to feel (this can be done as a recap and extension of the previous session).</p> <p>Set up raised beds for planting of projects. Provide and show learners how to use basic gardening tools.</p> <p>Learners need to keep a structured diary to include their plans for all cultivations, records, monitoring and evaluations.</p>	AC1a, b AC4b AC5a–c	TW1, 2 EP3	SL1 W1, 3	3	<p>Resources required: raised beds, top soil, compost, seeds, seed trays, pots, slow release fertiliser pots.</p> <p>Links to Unit 1: Environmental influences upon ecosystems and environmental and land-based production enterprises.</p>

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5 Assessment: plant care programme	<p>For two cultivated and two wild plant species, ask learners to produce a plan that can be implemented for the planting and management of their chosen species. (If an edible plant is used this can then be harvested later.)</p> <p>Plans must have a diagram of the planting area and a written explanation/justification of the learner's plan. It must include how the plant will receive the necessary nutrients and the importance of nutrition. Learners must also discuss the use of fertiliser and decide whether or not to use it.</p>	AC1a, b AC4b AC5a–c	SM1–4 EP4 CT1, 3, 5 IE2	W1, 4–6 R1, 2 Use ICT 1.1, 1.2, 3.1, 3.2 F&S ICT 2.2, 2.3 DPC ICT 1.1–1.3, 3.1	3	An extra hour may be needed to complete any outstanding work from session 4.
6 Assessment: plant care programme (continued)	<p>Learners can now set up and sow their chosen plants. Ensure all learners have a diary or record book in which to monitor all their plant management.</p> <p>Learners should spend some time designing their records. The records must show the dates of their visits, have room to record to all actions observed at each visit, any difficulties or adverse effects when administering the plan and an evaluation of how they feel the management programme is going.</p>	AC1a, b AC4b AC5a–c	SM2, 3 CT6	Use ICT 1.1, 1.2, 3.1, 3.2 DPC ICT 1.1, 1.2, 1.4, 4.2 W1, 3, 6	3	<p>Resources required: plant labels and pens.</p> <p>Useful books: <i>Grow Your Own Veg</i>, Carol Klein; <i>Vegetables in a Small Garden: Simple Steps to Success</i>, RHS; <i>Kitchen Garden</i>, Lucy Peel.</p>
7 Propagation techniques, asexual reproduction, pollination and germination	<p>Arrange a visit to a commercial greenhouse to view commercial plant production. The visit should show learners the methods used to produce new plant strains and propagation techniques.</p> <p>Learners will need to be familiar with the following: propagator, germination plants, rooting hormone, water butts, greenhouse heater.</p>	AC2b AC3a, b	CT1, 2	SL1 W1, 2, 4–6	3	This session will need to be supported by an individual study task to ensure the information presented during the visit has been understood.

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8 Plant selection, basic genetics and plant breeding	<p>Recap the basic principles of genetics.</p> <p>Discuss why the selection of sound breeding stock is critical. As a group, learners need to produce guidance on the considerations that should be taken when selecting breeding stock.</p> <p>Discuss how plants can be bred from cuttings and how the selection is made for a cutting. Learners should then take their own cuttings in the greenhouse for replanting.</p>	<p>AC2a, b</p> <p>AC3a, b</p>	<p>CT1</p> <p>TW1</p> <p>RL4</p>	<p>DPC</p> <p>ICT 3.2</p> <p>SL1</p> <p>W2–5</p>	3	<p>Resources required: compost bin and worms.</p> <p>Basic principles of genetics should have been covered in Unit 4.</p>
9 Wild plant succession	<p>Use slide shows and group discussion (where learners describe what is happening) to ensure they understand the principles of plant succession.</p> <p>Organise a tour of a local countryside to take photos of succession in these areas. As a group, discuss what is likely to be the next stage of development in the area.</p> <p>Using the photographs obtained earlier, produce annotated posters to explain the stages of succession these areas have gone through.</p>		CT1, 2	SL1	3	<p>Links to Unit 1: Environmental influences upon ecosystems and environmental and land-based production enterprises.</p> <p>As the course progresses, new learners will be able to view these photos and take more of the next stage of succession in the area.</p>
10 Assessment	Ask learners to produce a report to detail the principles of succession and how plants are selected and bred.		SM2, 3	<p>W2, 4, 5</p> <p>Use ICT 1.1–1.5</p> <p>DPC</p> <p>ICT 3.2</p>	3	

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11 GM crops	<p>Arrange for a guest speaker to talk to the learners about GM crops. As a group, evaluate the social and moral principles. Ensure the discussion also looks at examples of how we have modified plants.</p> <p>Learners to produce a report highlighting the arguments for and against the use GM crops.</p>	AC3a, b	CT1, 2 TW1	SL1	3	Ensure learners are continuing with the plant care programme.
12 Legislation and codes of practice for the growing of plants	<p>Arrange a visit to a nursery and a representative to talk to the learners about the legislation and codes of practice that govern their work.</p> <p>Learners to produce a leaflet explaining the legislation and best practices that nurseries abide by.</p>	AC2b, c AC3a	TW1 SM2	SL1	3	Links to Unit 2: Working in the environmental and land-based sector.
13 Assessment preparation	<p>Ask learners to prepare a presentation to be given to the class next week. They must cover, in detail, legislation and codes of practice governing plant production (breeding and growing), and the scientific and moral principles underpinning genetic modification of plants.</p>		TW1, 2 SM2, 3	DPC ICT 3.2 W2, 4, 5	3	Links to Unit 2: Working in the environmental and land-based sector.
14 Pests and diseases	<p>Introduce pest control (biological and chemical) and disease recognition and management.</p> <p>Learners need to be able to identify common plant diseases, the signs of the onset of disease and the plants that are most likely to be affected. This can be delivered using slides and/or a matching game in which learners match the pest to the plant.</p>	AC2d	CT1–3	Use ICT 1.1–1.3	3	Useful book: <i>The Pest and Weed Expert</i> , D.G. Hessayon.

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15 Pests and diseases in mature plants	<p>With the use of images, show learners how to recognise diseases in mature plants and the methods available to control these.</p> <p>Take learners to visit an established plant area. Learners will need to identify the plants and look for any diseases.</p>	AC2d	TW1	SL1	3	Ensure learners are continuing with the plant care programme.
16 Assessment	<p>Ask learners to produce a leaflet on disease recognition and treatment for a chosen crop.</p>	AC2d	SM2, 3	W1, 2, 4-6 DPC ICT 1.1, 1.4, 2.1, 3.1, 3.3, 4.2	3	
17 Commercial food harvesting and production	<p>Arrange for a guest speaker to come in or a visit to an arable farm to look at the harvesting process. Discuss legislation governing the harvesting process and health and safety issues.</p> <p>Learners to work in small groups and produce a Power Point presentation on legislation governing the harvesting process and health and safety issues.</p>	AC2c	CT1, 3	SL1	3	Links to Unit 2: Working in the environmental and land-based sector.

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18 Principles of food preparation and consumption	<p>Harvest and prepare the food grown during the unit for consumption.</p> <p>Working in pairs, ask learners to complete a five-minute presentation on how food is processed for human consumption. Discuss the health and safety issues involved.</p>	AC2c	SM2, 4 TW1, 2 IE4	SL3, 4 W2, 4, 5 Use ICT 1.1, 1.2, 3.2 F&S ICT 1.1, 2.1, 2.2	3	
19 Completion of diary	<p>Learners' diaries should have details of all plant management undertaken and copies of all records maintained.</p> <p>Ensure all witness statements and other evidence for assessment are present with the diary.</p>	AC2c	RL3–6	W2–4	3	