

## ENVIRONMENTAL AND LAND-BASED STUDIES

### Unit 4: Plants and animals: applied science



---

## Environmental and Land-based Studies

### Level 3 Unit 4: Plants and animals: applied science

#### 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.

<b>Total GLH</b>	60
<b>Delivery model</b>	Based on teaching three-hour sessions.
<b>Aim</b>	Learners will: <ul style="list-style-type: none"> <li>• develop an understanding of the applied science of plants and animals</li> <li>• be able to discuss the general function and physiology of plants and animals</li> <li>• be able to discuss in detail nutritional and reproductive systems.</li> </ul>
<b>Notes</b>	This unit has particular links with Unit 5 and Unit 6. This unit covers the function and physiology of plants and animals. It has a particular emphasis on nutrition, reproduction and disease.  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.

Topic	Activities, assignments, assessments	LO and AC	PLTS	FS	GLH	Resources and other comments
<p><b>1</b> Introduction to unit</p>	<p>The tutor should lead a class discussion on the subjects that will be covered in this unit.</p> <p>Conduct a group discussion on measurement and methodology. Learners must understand the concepts of intrusive and non-intrusive research methods. Discuss accuracy of data and error limits.</p> <p>Conduct a discussion on the plants and animals available to learners to monitor over the period and the viability of their choices.</p> <p>Learners should choose the animal and plant and set up the monitoring.</p>		<p>CT1 TW1</p>	<p>SL</p>	<p>3</p>	<p>Time must be given from each session to allow for learners to check up on the plants and animals that they are monitoring and take and record measurements.</p>
<p><b>2</b> Introduction to cells</p>	<p>Learners must draw and label a plant cell and an animal cell (assessment of prior knowledge).</p> <p>The tutor should lead a class discussion on the structure, components and functions of a plant cell and an animal cell.</p> <p>Learners must complete a table that compares the structures within a plant and an animal cell.</p>	<p>AC1a, b</p>	<p>CT2</p>	<p>SL W</p>	<p>3</p>	

Topic	Activities, assignments, assessments	LO and AC	PLTS	FS	GLH	Resources and other comments
<p><b>3</b> Sub-cellular components</p> <p>Other components</p>	<p>Learners must research the common monomers and polymers, stating their functions and purpose. Special emphasis must be given to the differences between plants and animals. Learners should produce a table detailing their findings.</p> <p>Learners must research the function and purpose of the following: lipids, vitamins, hormones and enzymes. Special emphasis must be given to the differences between plants and animals. Learners should produce a table detailing their findings.</p>	AC1a, b	SM2	<p>R</p> <p>W</p>	3	
<p><b>4</b> Anatomy of a plant</p>	<p>Learners should draw and label the anatomy of a plant (assessment of prior knowledge).</p> <p>Follow with a class discussion on the anatomy of a plant to ensure everything has been covered.</p> <p>Learners should produce an annotated poster to cover plant anatomy and cell structure and function.</p> <p>Set up a practical session in which learners have access to a microscope. Learners should examine plant cells, and identify cells from ground, surface and vascular tissue.</p>	AC1a	<p>TW1</p> <p>IE2</p>	<p>SL</p> <p>R</p> <p>W</p>	3	

Topic	Activities, assignments, assessments	LO and AC	PLTS	FS	GLH	Resources and other comments
5 Physiology of plants	<p>Define the term 'physiology'.</p> <p>Conduct a group discussion on the mechanical, physical, and biochemical functions of plants. The tutor should draw out the main systems within a plant that form part of the physiology.</p> <p>Learners must produce annotated diagrams for each of the main transport systems within a plant and must cover at least nutrients, waste and energy.</p>	AC1a AC2a	TW1 IE2	SL W	3	
6 Anatomy of animals	<p>Draw and label the anatomy of a given species of animal (assessment of prior knowledge).</p> <p>Follow with a class discussion on the anatomy of an animal to ensure everything has been covered.</p> <p>Learners should produce an annotated poster to cover animal anatomy and cell structure and function.</p> <p>Set up a practical session in which learners have access to a microscope. Learners should examine animal cells, and identify cells from surface ground tissue and vascular tissue.</p>	AC1b	TW1 IE2	SL W	3	

Topic	Activities, assignments, assessments	LO and AC	PLTS	FS	GLH	Resources and other comments
7 Physiology of animals	<p>Conduct a group discussion on the mechanical, physical, and biochemical functions of animals. The tutor should draw out the main systems within an animal that form part of the physiology.</p> <p>Learners must produce annotated diagrams for each of the main transport systems within an animal and must cover at least nutrients, waste and energy.</p>	AC1b AC2b	TW1 CT2	SL W	3	
8 Nutrition	<p>As a class, discuss how nutrition impacts upon health.</p> <p>Learners could use the internet and other sources of information to research malnourishment in all its forms (underfeeding and overfeeding, general and specific nutrients).</p> <p>Using virtual dissection, learners should look at how nutrition is received by both plants and animals. They need to understand the chemical reaction required to utilise food efficiently.</p> <p>In pairs, learners must research common diseases that occur as a result of malnourishment.</p>	AC2a, b	TW1 CT2	SL Use ICT F&S ICT	3	
9 Reproduction and disease	<p>The tutor should lead a group discussion on the natural methods by which breeding of both plants and animals will occur.</p> <p>In their own time, learners must research and produce a report on how disease is controlled by humans in both domestic animals and cultivated plants.</p>	AC4a	SM2, 3 CT2	SL R W Use ICT F&S ICT	3	

Topic	Activities, assignments, assessments	LO and AC	PLTS	FS	GLH	Resources and other comments
<b>10</b> Commercial management of plants and animals	<p>Using case studies, conduct a group discussion on how commercial needs affect decisions that are made on the viability of plants and animals.</p> <p>Discuss the outcome and reason for this for a:</p> <ul style="list-style-type: none"> <li>• ewe that has had two very difficult lambings</li> <li>• plant labour intensive for harvest</li> <li>• Grand National horse with a broken leg.</li> </ul>	AC4c	SM2  CT2	SL  W  R	3	
<b>11</b> The need for monitoring and data to inform management decisions	<p>Learners must view and discuss a commercial feeding system such as the automatic transponder/responder system.</p> <p>Learners should discuss a feeding system that has no individual data and uses standard rations throughout the stock, identifying potential outcomes of using this method.</p> <p>Use scenario cards for a range of animals with different health statuses and report on the effect of both these types of feeding on the animal in the given scenario.</p>	AC2b	IE3	SL  W  R	3	Example of a feeding system to look at: pig feeding

Topic	Activities, assignments, assessments	LO and AC	PLTS	FS	GLH	Resources and other comments
<p><b>12</b> The outcomes from research and sharing of research</p>	<p>Invite an animal nutritionist to discuss how research has improved feeding programmes and the effect this is having on the ELB sector.</p> <p>Divide learners into groups. Each group must research one of the following (all topics to be covered):</p> <ul style="list-style-type: none"> <li>• Embryo transfer for a competitive animal</li> <li>• Artificial insemination</li> <li>• Disease control in animals</li> <li>• Genetic modification affecting fruit size</li> <li>• Production of a draught-tolerant plant</li> </ul> <p>Learners should evaluate what effects these methods are having on the industry.</p> <p>Learners' research should be in a format that can be shared with all individuals within the groups.</p>	AC4a	SM1–3  TW1, 2	Use ICT  F&S ICT  DPC ICT  SL	3	
<p><b>13</b> Pressure on commercial producers</p>	<p>Learners must report on how intensive farming and free range farming affect the health, nutritional and reproductive status of plants and animals. Learners must also consider the ethical, economic, environmental and social pressure upon the choice of management system.</p> <p>Conduct a group discussion to share research and consolidate understanding.</p>	AC4a, b	CT4  EP1	SL  W	3	

Topic	Activities, assignments, assessments	LO and AC	PLTS	FS	GLH	Resources and other comments
<b>14</b> Management of wild plants and animals	Using two scenarios, one wild plant-based and one wild animal-based, learners should consider: <ul style="list-style-type: none"> <li>• how the nutritional requirements are met in each scenario and the likelihood and consequences of it not being met</li> <li>• how the population is maintained and the risk for juveniles (for animals they should consider the mate selection process)</li> <li>• how disease is controlled</li> <li>• the effects of both abiotic and biotic factors on the population.</li> <li>•</li> </ul>	AC2a  AC4a, b	IE1, 2, 6	SL1	3	
<b>15</b> Food webs and external factors	Show learners short video clips that demonstrate the food webs of a range of habitats.  The tutor should then provide situations where an abiotic or biotic factor is changed or removed. Learners must evaluate the effect that this will have on the food web.	AC3  AC4c	CT1, 2	SL1  R  W	3	
<b>16</b> Problems of control, data and monitoring	Learners must list the methods used to monitor health status and numbers of wild populations for both plants and animals.  The tutor should lead a group discussion to discuss the advantages and disadvantages these methods may have.	AC2b	CT2	SL1	3	

Topic	Activities, assignments, assessments	LO and AC	PLTS	FS	GLH	Resources and other comments
<b>17</b> Effects of living conditions on populations	<p>For two given wild populations, one animal and one plant, learners must research and report on the effects of the predicted climate change on the animal/plant. They should consider evolutionary changes within the animal/plant species.</p> <p>For two given wild populations, one animal and one plant, learners must research and report on the effects of human need on the animal/plant in that area.</p> <p>Identify actions required to maintain health and population size of the above resource.</p>	AC3 AC4c	SM2 CT1 IE3	SL1 DPC ICT	3	
<b>18</b> Effective intervention strategies	<p>Ask learners to give reasons why human intervention may occur, eg to prevent extinction, human need for land, human want for F1 hybrids, and human want for a resource from a particular area, eg wood, ivory.</p> <p>Invite a conservationist to come in and discuss with the learners:</p> <ul style="list-style-type: none"> <li>• situations where human intervention may be deemed necessary</li> <li>• the effects of unnecessary intervention and the reason this may occur.</li> </ul>	AC2b AC3 AC4c	CT2, 4	SL1 W	3	
<b>19</b> Assignment					3	
<b>20</b> Assignment (continued)					3	