



## Environmental and Land-based Studies

### Level 2 Unit 1: Environmental influences upon ecosystems and environmental and land-based production enterprises

#### 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.

<b>Total GLH</b>	60
<b>Delivery model</b>	Based on teaching three-hour sessions and one full-day visit.
<b>Aim</b>	Learners will: <ul style="list-style-type: none"> <li>• understand how plants and animals are affected by the environmental conditions within their habitat</li> <li>• develop the skills required for analysing ecosystems and make judgements on the most appropriate usage.</li> </ul>
<b>Notes</b>	<p>This unit has direct links to Units 2 and 7. At the beginning of each session learners will be required to take readings from the weather station and record these appropriately.</p> <p>All sessions should contribute to the virtual learning environment, providing revision and recap material for learners.</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&amp;S ICT and DPC ICT.</p>

Topic	Activities, assignments, assessments	LO and AC	PLTS	FS	GLH	Resources and other comments
<b>1</b> Introduction to ecosystems	<p>Learners will be able to:</p> <ul style="list-style-type: none"> <li>• define abiotic and biotic factors</li> <li>• discuss examples of abiotic factors.</li> </ul> <p>Devise a group activity titled 'What species can live here?'. This is about seeing what examples learners can give of where abiotic and biotic factors influence organisms.</p> <p>Follow with a tutor-led discussion on abiotic and biotic factors. Use PowerPoint slides to support the discussion.</p> <p>Discuss the following factors: temperature, water/rainfall, growing season, soil, climate, topography, aspect and vegetation types.</p> <p>Use picture cards of different landscapes. Start with the really obvious, eg deserts and polar regions, and then move to examples in the UK.</p> <p>Conclude with an introduction to recording meteorological data. Each student is to volunteer the dates they will be responsible for taking the readings.</p> <p>Take learners to explore a local area, identify the habitat range seen, and the biotic and abiotic factors that influence them.</p>	AC1a, b	CT1–3 TW1	SL1, 2 W1 R1	3	Resources required: PowerPoint and a projector.

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<p><b>2</b> Introduction to geology, climate, temperature and the distribution of tree species in the UK</p>	<p>Provide an overview of what geology is and how it contributes to the environment.</p> <p>Follow with a discussion on the distribution of trees.</p> <p>As a class, examine distribution maps showing climate, geology and temperature. Learners need to understand how to use these maps for research purposes. Ideally use maps covering the UK.</p> <p>Ask learners to use the maps to summarise the environmental requirements for two species of trees and to identify areas of the UK where they should be the most prevalent.</p>	AC1b	IE2, 4 CT1, 4, 6 RL5	M1, 2, 11, 12 W2 SL1 Use ICT1.1	3	<p>Resources required: distribution maps.</p> <p>Links to Unit 7, AC2a: use environmental monitoring methods and techniques to profile a chosen habitat.</p> <p>Links to Unit 1, AC4a: use keys to identify species of plants and animals found within habitats to determine the biodiversity in the area.</p> <p>Links to Unit 1, AC4b: use scientific techniques to identify different soil components.</p>
<p><b>3</b> Visit to local area of heath land</p>	<p>Arrange a visit to a local area of heath land to look at its geology and historical distribution in the local area.</p> <p>Learners should carry out soil pH tests. They should then create a soil pit to study the composition of the soil and its inhabitants (ie the organic matter and horizons within the soil profile).</p> <p>This task is to be repeated in four locations to ensure the following soil types are encountered: clay, sand, silt and loam.</p>	AC1b AC4b	TW1, 3, 4 EP1	SL1 R1 Use ICT1.1 M1, 2	8	<p>Resources required: soil pH kits, spades and heath land identification cards.</p> <p>Links to Unit 1, AC4b: use scientific techniques to identify different soil components.</p> <p>Links to Unit 3</p>

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<p><b>4</b> Impact of climate change on plant and animal communities</p>	<p>Use some well-known examples of climate change and discuss the effects they had on plants and animals. Use DVDs, slide shows and images to support group discussion.</p> <p>Working in pairs, ask learners to research how the current changes and predicted changes in climate will affect plants.</p> <p>Learners should then report their findings in the form of a poster.</p>	AC1b	IE1, 2, 4 CT1, 2 TW1, 2	SL2, 3 W1	3	<p>Resources required: DVDs, images, a projector and internet for learners' own research.</p> <p>Links to Unit 7: Monitoring the environment.</p>
<p><b>5/6</b> Main principles of succession</p>	<p>Provide an overview of the term 'succession' in this context and its main principles. Use images and video clips to demonstrate the main principles.</p> <p>Devise supporting activities in which learners look at areas of land and predict the succession.</p> <p>Give a presentation about the work of the RSPB. Arrange a visit to a wetlands reserve, ideally with links to the RSPB. Take learners on a guided talk and walk to show succession through habitats on the reserve.</p> <p>Encourage learners to visit different habitats.</p> <p>The RSPB guide will need a clear break down of aspects of the learning outcomes required. Ensure you reference all applicable from this unit and other units.</p>	AC2a	IE6 CT1	SL1 W1	6	<p>Resources required: video clips, images and a projector.</p> <p>Links to Unit 3, AC2a: describe the principles of wild plant succession.</p> <p>Links to Unit 6, AC2b: outline ways in which key interest groups influence environmental activities and uses of habitats.</p> <p>Links to Unit 7, AC1b: explain the scope of organisations and agencies involved in environmental monitoring within the legislative framework.</p>

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<b>7/8</b> Nutrient cycles and the role of micro-organisms	<p>Explain the carbon, oxygen and nitrogen cycles, using outlines of these cycles for learners to annotate.</p> <p>Walk through a grazing meadow to look at the effects of time on cow dung and relate this to the three cycles. Learners should be able to identify how long the dung has been on the ground by the effects of the micro organism cycle.</p> <p>Then ask learners to consider how the decay of a dead animal will fit into these three cycles.</p>	AC2b	IE1, 4 CT1, 5	W2 SL1	6	Resources required: access to grazing meadows and gloves.
<b>9</b> Food webs	<p>Introduce food webs – what they are and how they work.</p> <p>Introduce the idea of food webs through food web games and interactive web information.</p> <p>Ask learners to produce a food web for a given animal.</p>	AC2c	CT5 IE4	SL1 Use ICT1.1–1.5, 2.1	3	
<b>10</b> Case studies on food webs in trouble	<p>As a group, discuss why food webs go wrong. For example, on farmlands, the loss of hedgerows to expand field size can result in a loss of predators and lead to an increase in disease.</p> <p>Then ask learners to research other food webs that are under threat and the reasons for this, eg Norfolk Broads' mink, grey squirrels, bees, deer and rhododendrons. They will need to present their findings to the rest of the group.</p>	AC2c	CT3–5 EP1, 2	SL1–3 Use ICT 1.1–1.5, 2.1 F&S ICT 1.1, 2.1, 2.2 DPC ICT 1.1, 1.5, 2.1	3	

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<b>11</b> Environmental and land-based enterprises	<p>Working in groups, ask learners to identify characteristics of the physical landscapes that would have an influence over the distribution of environmental and land-based enterprises.</p> <p>Using maps of the UK, learners need to identify whether there appears to be any correlation between the distribution of environmental and land-based enterprises and the physical characteristics of the UK.</p> <p>They should look at the UK's topography, soil, geology and climate, and then link this to the distribution of farming types in the UK.</p> <p>Using a map of the UK, ask learners to identify all the counties and then, using collage material identify the percentage of each farming type within in that county.</p>	AC3a	TW2, 4 CT3, 4 IE4	SL1 M1–4 Use ICT 1.1	3	<p>Links to Unit 2: Working in the environmental and land-based sector.</p> <p>Links to Unit 6: The importance of a sustainable environment to society.</p>

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<p><b>12/13</b> How human systems manipulate organisms</p>	<p>If possible, arrange two visits; one to a piggery and one to a nursery. The aim is to look into land-based sector industries and how humans manipulate the animal organisms within them.</p> <p>As a class, discuss how weight determines the timing of the sale of a pig for food and how selective breeding is used to increase the value of pigs.</p> <p>Follow with a discussion on factory breeding versus free range.</p> <p>At a plant-breeding centre, for instance, learners should look at how the environment is managed to optimise the plant growth and flower productivity. Follow with a discussion on organic growth versus intensive.</p> <p>Upon return to the classroom lead a discussion on commercial influences on the production of salmon. The discussion should include consumer perception and the cost of production.</p>	AC3a	EP2, 5 IE5 CT3, 4	SL1	6	Links to Unit 2: Working in the environmental and land-based sector.

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<p><b>14 Populations</b></p>	<p>Provide an overview of how births, deaths and migration affect the ecosystem.</p> <p>Learners should conduct a survey to investigate the use of farm habitats by small mammals. Learners will need to use small mammal traps to complete the survey and must be made aware of the risks and how to use the equipment properly.</p> <p>Discuss when it would be appropriate to use the mark/recapture method and the technique used to achieve this.</p> <p>Learners should use keys to identify the species of mammals and plants in the habitat. They must record their findings in appropriate tables and analyse the population statics.</p> <p>Special attention must be given to any underlying assumptions about population density and capture rate. Using the survey, learners can determine biodiversity.</p>	AC4a	IE1, 2, 4, 6 CT3–5 TW1, 2	M1–3, 6, 11, 12	3	Resources required: Longworth traps, casters, hay, oats, keys and scissors.
<p><b>15 Weather conditions</b></p>	<p>Recap the key considerations when identifying positions of meteorological equipments and how to set up.</p> <p>Learners can now evaluate the data collected from the weather stations and identify variations. Lead the group into a discussion on the identification of trends and methods used to predict future weather.</p> <p>Using previously collected information by the learners and previous data from the same area, learners should then identify long-term trends, compare their own results with the long-term trends and predict future weather.</p>	AC4b	IE4 CT2–4 TW2	M1–6, 10 SL1 W1 R1	3	

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<b>16</b> End of unit revision	<p>Conduct in-class formative assessment to include a range of assessment methods.</p> <p>Hand out the assignment brief and discuss with learners their requirements for equipment.</p> <p>Learners should produce a list of required equipment for their soil tests for the next session and the meteorological data they would like made available.</p>		IE2 CT2 SM2, 3	R1 W2–6	3	
<b>17</b> Assessment: determine viable uses for an environment	<p>The assessment should cover all five learning outcomes. When compiling your assessment brief ensure that learners have the opportunity to demonstrate their understanding of the five main learning outcomes so that they can meet the demands of the assessment criteria at the highest levels.</p> <p>Working in groups of three, for an area of countryside, learners need to analyse the soil via the use of a soil pit and appropriate testing and observations. They must identify the common animal and plant species within their selected site.</p> <p>Visual observations of the surrounding countryside and reference to ordinance survey maps will be required to establish the topography and water sources and access to the selected area.</p> <p>Using their meteorological data, ask learners to compile a graphical representation of the major meteorological conditions against time.</p> <p>As evidence, learners will need to produce a record of research including biodiversity, soil and weather observations.</p>	AC4a–c AC5a, b	SM all TW all EP all CT all IE2, 4, 6	SL all W all ICT (if used)	3	<p>Verbal or PowerPoint presentations may need to be supported by written reports to ensure the coverage of all assessment criteria.</p> <p>Multimedia evidence should be encouraged for the practical tasks and verbal presentations.</p>

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<p><b>18</b> Assessment: describe how the environmental and physical characteristics of the landscape affects animals, plants and environmental and land-based organisations distribution</p>	<p>Ask learners to produce a report to present to the owner of their selected site, suggesting viable alternative use of their land. These suggestions must be supported with reasoned arguments based on the data provided and gathered.</p> <p>The report should comment in detail upon the succession stages the site has experienced, its role in any food webs and any influences of the three cycles upon the site.</p>	<p>AC1a, b AC2a–c AC3a</p>	<p>SM all TW all EP all CT all IE4, 6</p>	<p>W2, 4–6 Use ICT 1.1–1.5, 3.2 DPC ICT 1.1–1.3, 3.2</p>	<p>3</p>	