

ENVIRONMENTAL AND LAND-BASED STUDIES

Unit 7: Monitoring the environment



Environmental and Land-based Studies

Level 2 Unit 7: Monitoring the environment

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	30
Delivery model	Based on teaching 2.5 hours per session.
Aim	Learners will develop the knowledge and skills to monitor and measure the environment, and gather and analyse data.
Notes	<p>All guest speakers will need detailed guidance on the material you wish them to cover to ensure that the requirements of the course are met.</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 Introduction to the unit	<p>Ask learners to list reasons for monitoring the environment.</p> <p>As a class, discuss the reasons for environmental monitoring, eg air and water quality, pollution levels in species, species indices and radioactive substances.</p> <p>Working in groups, ask learners to produce a table that lists what we monitor within the environment, how it is monitored and what would happen to the environment should the findings obtained during monitoring be above the accepted range.</p>	AC1a	CT2 IE3, 4	SL1 W1, 3	2.5	Links to Unit 7, AC1b: explain the scope of organisations and agencies involved in environmental monitoring within the legislative framework.
2 Organisations and agencies involved in environmental monitoring	<p>Ask learners to conduct research to identify how the following organisations are linked to environmental monitoring and the role that they play in raising awareness in the media:</p> <ul style="list-style-type: none"> • Farming and Wildlife Advisory Group • Forestry Commission • Linking Environment and Farming • Wildlife Trusts • Game Conservancy Trust • Environment Agency • Met Office • Natural England. 	AC1b	CT1-3 IE2–4 SM2, 3	R1, 2 W2, 4–6 Use ICT 1.1–1.5, 3.1, 3.2 F&S ICT 1.1, 2.1–2.3 DPC ICT 1.1, 1.3	2.5	Links to the visit in Unit 6 to a LEAF farm.

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<p>3 Effects of climate change</p>	<p>After viewing the historical meteorological data for an area, ask learners to illustrate a trend and predict the changes to the climate in 20 years.</p> <p>From a given list of ELB enterprises within the area, learners should then identify how this will affect the resources and management of the land.</p> <p>Learners can then produce a step-by-step guide to minimise the changes to the climate over the next 20 years.</p>	AC1b	CT1–3 IE2–4 SM2, 3	M1–3, 11, 12 W2, 4–6	2.5	
<p>4 Organisations and agencies involved in environmental monitoring</p>	<p>Invite a guest speaker, such as an ecologist, to talk about their work with European protected species and the link to government and planning policies.</p> <p>Ask learners to identify endangered or rare species and report on how monitoring these can indicate wider changes in the environment affecting all types of species.</p> <p>Using case studies provided by the organisation, the learner should produce a report on the environmental impact on plant life. In particular, learners should highlight within their report how the results of this case study could be used for further research.</p>	AC1b	CT2 IE3, 4	SL1 W1, 3	2.5	

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5 Assignment	<p>For the assignment, learners must devise and justify a plan for a monitoring scheme of a habitat. As a class, the learners should undertake a survey of the habitat, paying particular attention to plants, water sources and soil types. Discuss the profile of the chosen habitat. Learners will need to:</p> <ul style="list-style-type: none"> • produce a plan, including the methods and outcomes to be monitored • complete a risk assessment for the activities • report on the possible effects of the survey on the habitat • list the possible pollution types/sources for the area being monitored. 	AC2c	CT1–4 IE1–4 SM1–4, 6	SL1 W2–5	2.5	The assignment brief must clearly outline all the areas to be discussed at all stages of the survey.
6 Implementation of assignment	Learners will now implement their plans and the monitoring activities. They must also gather water samples ready for the next session.	AC2a	SM1–4, 6		2.5	Links to Unit 1, LO2: understand how ecosystems work.
7 Laboratory analysis of water	<p>Learners should now analyse the water (from the samples collected the previous week) in the lab. They will need to test the pH levels, Dissolved Organic Matter (DOM) content, load in solution/conductivity, filter, turbidity.</p> <p>As a class, discuss possible errors with survey methodology and the results and analysis.</p>	AC2a, b AC3a	CT1–3 IE1–4 SM2, 3	M1–4 SL1 W1, 3	2.5	Resources required: pH indicator paper, filters, test tube.

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8 Producing an environmental scheme	<p>Learners will need to produce an environment scheme to better manage the river catchments for wildlife. They will then write a report on all their findings from this survey.</p> <p>They should identify any factors having a negative effect and then brainstorm how these could be minimised or removed.</p> <p>The report should include all of the following:</p> <ul style="list-style-type: none"> • a cross-section of the river • velocity • volume of water and flow • description of the vegetation • list of land use • Trent Biotic Index results to score river pollution. 	AC3b	CT1–4 IE1–4 SM2, 3	M1–3, 8 W2-6 Use ICT 1.1–1.5, 3.1, 3.2 DPC ICT 1.1, 1.3	2.5	Resources required: catchment OS maps, land use charts and list of industries in the area.

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<p>9 Assessment</p>	<p>For the assessment, learners can choose to work on either option A or option B. A risk assessment must be included.</p> <p>A: Survey using small mammal traps and the mark and recapture method. Learners will use keys to identify the species of mammal and the plants in the habitat (eg hedge, grass). Learners will then propose a scheme or plan of ideas that could improve the college/school estate for small mammals.</p> <p>B: Investigation into the effect of farm habitats on the numbers of earthworms. Learners will look at three habitat types (eg a hedgerow, pasture or arable field) and conduct an earthworm survey. They will need to undertake soil and water tests.</p> <p>Take soil to the laboratory. Learners should undertake the following tests: pH, water content, Dissolved Organic Matter (DOM) content, air.</p>	AC3c	CT1–4 IE1–4 SM1–4, 6	SL1 W2–5	2.5	Resources required: computers, information on sites that can be are being proposed for survey.
<p>10 Assessment (continued)</p>	<p>Learners will now implement their plans and the monitoring activities.</p>	AC3	SM1–4, 6		2.5	<p>Option A resources required: Longworth traps, casters, hay, oats, keys and scissors.</p> <p>Option B resources required: quadrat, hand trowel, indicator paper, clinometer, infiltration tube, bottle of water, gloves, trowel, three plastic bags/bottles for soil samples.</p>

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11 Assessment (continued)	Learners must then produce a report of their activities and findings. The report can be in any format but must include the following: <ul style="list-style-type: none"> • an explanation of reasons for monitoring • a list of organisations and agencies that are involved with environmental monitoring within the legislative framework • an explanation of the methods used and why • an explanation of how experimental error was minimised • a detailed analysis of data with ideas on how this could be used in an environmental scheme with a persuasive case for the importance of environmental monitoring. 	AC3a	IE1–4 CT1–4 SM2, 3	W2–6 Use ICT 1.1–1.5, 3.1, 3.2 DPC ICT 1.1, 1.3	2.5	Resources required: data gathered from surveys, computers. Links to Unit 1, AC4b and AC4c: use scientific techniques to observe different soil components and weather conditions.