Sample Teaching Plan
Unit G633: Ecology and Managing the Environment

Suggested teaching time	Plan is based on 12 weeks at 5 hours per week (4 hours contact time + 1 hour directed study).

The learning activities are suggestions only. Teachers may wish to develop alternative strategies. The plan should be read alongside the G633 Specification and, in particular, the Assessment Evidence Grid (attached for your reference).

Week number	Specification Unit Reference and Assessment Objectives	Suggested Learning Activities	Resources
1	**3.14.1:** Investigation of Ecosystems • describe methods available to measure the physical factors that affect the distribution of organisms in ecosystems, including the way in which computer technology is used in ecological research • describe methods available to measure the distribution of organisms using appropriate sampling techniques (quadrats, sampling randomly and along a line or belt transect) and counting methods (species density, species cover) throughout the ecosystem studied.	**Task 1** Teacher-led instruction. **Task 2** Candidate research - **plan** an investigation of one ecosystem, selecting and using appropriate equipment and techniques to make measurements of physical and biological factors. (introduction to preparatory work for *Sample Assignment B*).	Teacher-generated 'need to know' sheet. Should include the principles, facts etc. likely to be assessed based on the specification references. Worksheets for candidate tasks.

Week number	Specification Unit Reference and Assessment Objectives	Suggested Learning Activities	Resources
2	• present and display data (provided) using appropriate tables and graphs • summarise data using the appropriate descriptive statistics (mean, standard deviation) • manipulate data using appropriate statistics, e.g. Simpson's diversity index • relate the suitability of the methods used to collect data to the particular habitat and the organisms being studied • use the appropriate statistics, e.g. chi-squared test or t-test, to test the validity of any possible trends in data • form valid conclusions on the distribution of organisms based on data provided and statistical analysis • explain the relationships between the organisms in the ecosystem and their physical environment • evaluate the validity of the data provided based on the monitoring methods used.	**Task 1** Use data **provided** by the teacher to consider methods of data presentation. **Task 2** Use data **provided** by the teacher to find out how to complete the Simpson's diversity index calculations.	Teacher-generated 'need to know' sheet. Should include the principles, facts etc. likely to be assessed based on the specification references. Worksheets for candidate tasks.

Week number	Specification Unit Reference and Assessment Objectives	Suggested Learning Activities	Resources
3	**3.14.2:** Effects of Change on Ecosystems • describe the process of succession within ecosystems • research and describe how agricultural practice (monoculture and hedgerow removal, use of pesticides and fertilisers) has led to changes in ecosystems and biodiversity • research and describe how the requirement for human habitation has affected ecosystems and biodiversity • research and discuss how greenhouse gas production (natural and man-made) may affect ecosystems and biodiversity.	**Task 1** Teacher-led instruction. **Task 2** Candidate research with a particular focus on agricultural practice. **Task 3** Candidate research with a particular focus on the impact of human habitation on ecosystems and biodiversity.	Teacher-generated 'need to know' sheet, worksheets for candidate tasks.

Week number	Specification Unit Reference and Assessment Objectives	Suggested Learning Activities	Resources
4	**3.14.2:** Effects of Change on Ecosystems (cont.) • research and discuss how greenhouse gas production (natural and man-made) may affect ecosystems and biodiversity **3.14.3:** Investigation of the Management of Ecosystems • evaluate the methods used to decrease the emission of man-made greenhouse gases (cleaner industrial production, legislation, use of recycling systems) and discuss the ways in which levels of greenhouse gases in the atmosphere could be reduced (carbon sinks) **3.14.1:** Investigation of Ecosystems • review the plan for an investigation of one ecosystem, selecting and using appropriate equipment and techniques to make measurements of physical and biological factors.	**Task 1** Teacher-led instruction, including a simple model of greenhouse gases in relation to the carbon cycle. **Task 2** Candidate research with a focus on the production, assessment and emission reduction of greenhouse gases. **Task 3** Candidate group feedback session, in relation to the outline plans for ecosystem investigations.	Teacher-generated 'need to know' sheet, worksheets for candidate tasks.

Week number	Specification Unit Reference and Assessment Objectives	Suggested Learning Activities	Resources
5	**3.14.3:** Investigation of the Management of Ecosystems • identify scientific, moral and ethical reasons for preserving biodiversity on the planet • evaluate the effectiveness of sustainable practices for agriculture and use of natural resources in preserving species diversity • evaluate how the management of designated areas (conservation areas, ecotourism, bioremediation to remove toxic material) is used to preserve ecosystems and biodiversity • evaluate the methods used in the management of an ecosystem by one ecologist, a team of ecologists, a professional body, or group of scientists; candidates need to examine information and other data on the project and evaluate fully the effectiveness of the management techniques.	**Task 1** Teacher-led instruction, including a candidate debate for the preservation of biodiversity. **Task 2** Candidate research with a focus on the sustainable practices in agriculture. **Task 3** Teacher-led instruction, using an up-to-date video/CD showing examples of ecotourism and bioremediation.	Teacher-generated 'need to know' sheet, worksheets for candidate tasks.
6	**Review period (before starting assignment briefs)**	**Task 1** Teacher-led review of issues identified during weeks 4 – 5 in relation to the effects of change on ecosystems (3.14.2) and the management of ecosystems (3.14.3). **Task 2** Candidates identify further issues to be clarified prior to carrying out the coursework assignment(s).	

Week number	Specification Unit Reference and Assessment Objectives	Suggested Learning Activities	Resources
7 – 12	**Planning and carrying out assignment work**	**Task 1** Teacher-led outline of assignment brief and the assessment recording sheet (to enable candidates to be fully aware of tasks to be completed and marks available for each). **Task 2** Candidates review the preparatory work carried out in for *Sample Assignment B*. **Task 3** Plan and carry out chosen assignment i.e. investigation of an ecosystem (using *Sample Assignment A* as a guide). **Task 4** Teacher-led review of assignments completed by candidates, providing feedback as appropriate.	

Unit G633 - Assessment Evidence Grid

Unit G633: Ecology and managing the environment
What the candidate needs to do:
The candidate needs to produce evidence of their investigation on ecology and managing ecosystems [**50** marks].
This evidence needs to include**:**
AO1: a knowledge and understanding of the effects of change on ecosystems and biodiversity, describing ecological succession and researching the effects of agricultural practice, human habitation and greenhouse gas production [**10**];
AO2: a discussion of the reasons for preserving ecosystems and biodiversity, describing the methods available to do this, and carrying out a study and evaluation of the methods used to manage an ecosystem [**14**];
AO3: a planned investigation of an ecosystem [**26**].
How the candidate will be assessed:

Assessment Objective	Mark Band 1	Mark Band 2	Mark Band 3	Mark Awarded
AO1	Candidate will demonstrate a basic knowledge and understanding of the relationship between the organisms, their physical environment and each other in ecological succession; **[0 1]**	candidate will demonstrate a sound knowledge and understanding of the relationship between the organisms, their physical environment and each other in ecological succession; candidate will use appropriate scientific terms and conventions accurately; **[2 3]**	candidate will demonstrate a thorough knowledge and understanding of the relationship between the organisms, their physical environment and each other in ecological succession; candidate will use appropriate scientific terms and conventions accurately. **[4 5]**	
	Candidate will research the effect of agricultural practice, human habitation and greenhouse gas production on ecosystems and biodiversity, selecting information and presenting it clearly, using correct spelling, punctuation and grammar; **[0 1]**	candidate will research the effect of agricultural practice, human habitation and greenhouse gas production on ecosystems and biodiversity, selecting a wide range of information, giving reasons for their choice of resources, and presenting it clearly and logically, generally using correct spelling, punctuation and grammar; **[2 3]**	candidate will research the effect of agricultural practice, human habitation and greenhouse gas production on ecosystems and biodiversity, selecting a wide range of relevant information and presenting it clearly and logically, using correct spelling, punctuation and grammar throughout; candidate will evaluate the information available and justify the choice that they have included. **[4 5]**	**/10**

Unit G633: Ecology and managing the environment (continued)				
Assessment Objective	**Mark Band 1**	**Mark Band 2**	**Mark Band 3**	**Mark Awarded**
AO2	Candidate will identify some of the scientific, moral and ethical reasons for preserving ecosystems and species diversity; **[0 1]**	candidate will identify and explain the scientific, moral and ethical reasons for preserving ecosystems and species diversity; **[2 3]**	candidate will organise information to evaluate the scientific, moral and ethical reasons for preserving ecosystems and species diversity. **[4]**	
	Candidate will describe some of the methods used to manage ecosystems and preserve species diversity; candidate will give a limited interpretation of information relating to the success of a project managing **one** ecosystem; **[0 1]**	candidate will describe methods used to manage ecosystems and preserve species diversity; candidate will describe and interpret data relating to the success of a project managing **one** ecosystem; **[2 3]**	candidate will describe a range of methods used to manage ecosystems and preserve species diversity; candidate will interpret, explain and evaluate a range of data relating to the success of a project managing **one** ecosystem. **[4 5]**	
	Candidate will carry out straightforward calculations on ecological data (e.g. mean, standard deviation) and will sometimes obtain the correct solutions; **[0 1]**	candidate will carry out complex calculations on ecological data, involving some use of statistics (e.g. diversity indices) and obtaining the correct solutions; **[2 3]**	candidate will carry out complex calculations on ecological data involving the statistical analysis of the data obtained (e.g. chi-squared or t test); candidate will obtain the correct solutions to an appropriate degree of accuracy and demonstrate an understanding of the significance of the outcomes. **[4 5]**	**/14**

Unit G633: Ecology and managing the environment (continued)				
Assessment Objective	Mark Band 1	Mark Band 2	Mark Band 3	Mark Awarded
AO3	Candidate will produce risk assessments; candidate will carry out measurements of some factors affecting the ecosystem that the candidate studied, using a range of techniques and equipment; **[0 1 2 3 4]**	candidate will produce risk assessments, consistent with COSHH guidelines; candidate will carry out measurements of factors affecting the ecosystem that the candidate studied, using a range of techniques and equipment; candidate will have repeated measurements, working with an appropriate degree of accuracy; **[5 6]**	candidate will produce their own detailed risk assessments, consistent with COSHH guidelines; candidate will carry out measurements of a wide range of factors affecting the ecosystem that the candidate studied and explain why they used a range of techniques and equipment; candidate will explain the need to have repeated measurements, and work with an appropriate degree of accuracy. **[7 8]**	
	Candidate will make and record relevant observations and measurements in the ecosystem; **[0 1 2]**	candidate will make and record relevant observations and measurements in the ecosystem, using precision in their measurements; **[3 4]**	candidate will make and record a detailed set of relevant observations and measurements in the ecosystem, using the appropriate precision in their measurements. **[5 6]**	
	Candidate will display the ecological data obtained using tables, with help; **[0 1]**	candidate will display the ecological data accurately in a range of ways; **[2 3]**	candidate will process and display accurately ecological data in a range of ways chosen to best illustrate the trends in the data. **[4]**	
	Candidate will give some interpretation of the results and relate these to the occurrence and distribution of species within the ecosystem studied; **[0 1 2 3 4]**	candidate will interpret the results, and draw basic conclusions, relating their results to the occurrence and distribution of species within the ecosystem studied; **[5 6]**	candidate will interpret the results in detail, and draw conclusions relating their results to the occurrence and distribution of species within the ecosystem studied. **[7 8]**	**/26**
			Total mark awarded:	**/50**