
Sample Assignment: Unit 14 Ecology and Managing the Environment

WORKSHEET – PREPARATORY WORK

Unit Name: Ecology and Managing the Environment	Unit Number: 14
Assignment Title: Planned Investigation of an Ecosystem – Preparatory Work	Time Allocation:
Assessment Information: The planned investigation of an ecosystem is awarded 26/50 marks for this unit. It is essential that you are aware of the possible techniques and methods available to you before you start to plan it.	
Aims and Objectives: The aim of this work is to prepare you for the investigation on an ecosystem Work through the tasks and then use the techniques you have learned to carry out the requirements for assessment by using Assignment 14.3.	
Task 1: You will need to prepare a risk assessment for the work carried out during your planned investigation. This will need to be specific to the investigation you eventually carry out. In preparation you should consider the following and any others you can think of, in a fieldwork context: <ul style="list-style-type: none">• Potential hazards• What could go wrong• Safety precautions• What to do in case of accident• Assess the level of risk.	

Task 2:

You need to carry out preliminary work to research and practice the techniques available to ecologists for making measurements of physical factors within ecosystems should be carried out. These could include:

- Temperature - thermometers, data-loggers, and/or thermistors
- pH – indicators, pH meters and/or data-loggers
- Oxygen content – electrodes, data-loggers, chemical techniques
- Salinity – density methods, conductivity, titration
- Solutes – using chemical methods e.g. testing kits for nitrates, phosphates
- Pollutants – indicator species, e.g. Trent Biotic Index, River Invertebrate Prediction and Classification System (RIVPACS)
- Organic matter – using turbidity measurements
- Microorganisms – using plating techniques
- Light intensity – light meters, data-loggers.

Task 3:

You need to carry out preliminary work to research and practice the sampling techniques available to ecologists to determine the distribution and frequency of organisms within ecosystems should be carried out. These could include:

- Quadrats
- Line transect
- Belt transect
- Frequency
- Species density
- Species cover.

Task 4:

You need to carry out preliminary work to research and practice the methods available to ecologists to display ecological data. These could include:

- Line graphs
- Bar graphs
- Histograms
- Kite diagrams
- Pictographs
- Pie graphs
- Rose diagrams
- Scatter graphs.

Task 5: (Max 5 marks)

You need to carry out preliminary work to research and practice statistical tests available to ecologists to apply to ecological data. To do this it will be necessary to carry out some calculations. Appropriate statistics could be used to:

- Summarise data using descriptive statistics (mean, standard deviation)
- Manipulate data (e.g. using Simpson's diversity index)
- Test the validity of trends or differences in data using comparative statistics (correlation coefficient, chi-squared test or t-test).

N.B. The marks available for AO3 a, b, c and d are only available in relation to the planned investigation itself. Therefore there are no marks available for Tasks 1, 2, 3 and 4. However up to 5 marks could be available for Task 5, which targets AO2 c, because this area of work is not tied to 'the planned investigation' on the assessment evidence grid. A separate Assignment sheet could be given to students if Centres wished to use this approach.

Resources:

Class notes on:

- Operating equipment available
- Statistical tests.

Case-study material (if time does not permit school-based field data) to practice:

- Data display
- Statistical analysis.

Relevant paper and electronic-based material.