Stage 1 Biology

Investigations Folio: Practical Investigation Design

Topic 4: Biodiversity and Ecosystem Dynamics

**Purpose:**

This task allows you to:

* deconstruct a problem
* design an investigation
* obtain, represent, analyse, and interpret results of an investigation
* evaluate procedures
* formulate and justify a conclusion
* communicate using appropriate terms and conventions.

**Description of assessment**

**The scenario:**

A young couple has just moved in a courtyard home. They are keen to have a garden.

The previous owner of the home told the young couple that ‘nothing would grow’ in the garden area even though she watered it and regularly fertilised it.

Your task is to try to work out why nothing previously grew in the garden of the unit and make a recommendation based on your investigation.

**Guidelines for this task:**

1. Work out the factors that could be the cause of the problem.

2. Select one factor to investigate to find out whether it is the cause of the problem

3. Explore possible ways that you could test that factor in the laboratory

4. Select one factor to test, write a hypothesis, and design an investigation. (Include a blank data table to show how you will record the data)

5. Annotate your deconstruction and design to justify why you have chosen the variable to test, materials to use, measurements to make etc.

Submit your deconstruction and design for assessment. (Due date: \_\_\_\_\_\_\_\_\_\_\_\_)

6. Use an approved method from one of the members of your practical group to undertake an investigation and obtain data.

7. Write a report on the investigation that you undertake in which you include:

* introduction with relevant biological concepts, a hypothesis and variables, or investigable question\*
* materials/apparatus, method/procedure that outlines what was implemented
* identification and management of safety and/or ethical risks
* results
* analysis of results, identifying trends, and linking results to concepts\*
* evaluation of procedures and data, and identifying sources of uncertainty\*
* conclusion (which includes a justified recommendation based on your investigation)\*.

The report should be a maximum of 1000 words\* if written, or a maximum of 6 minutes for an oral presentation, or the equivalent in multimodal form.

\* Only the following sections are included in the word count: ***introduction, analysis of results, evaluation of method/procedure, conclusion.***

Assessment conditions

* Steps 1 to 5 are undertaken as an individual task which is completed during supervised class time, with access to computers and any other resources.
* Step 6 is undertaken as a collaborative activity during a double lesson.
* Step 7 is an individual report. You may choose the format of presentation.

|  |  |  |
| --- | --- | --- |
|  | Investigation, Analysis and Evaluation | Knowledge and Application |
| A | Critically deconstructs a problem and designs a logical, coherent, and detailed biological investigation.  Obtains, records, and represents data, using appropriate conventions and formats accurately and highly effectively.  Systematically analyses and interprets data and evidence to formulate logical conclusions with detailed justification.  Critically and logically evaluates procedures and their effect on data. | Demonstrates deep and broad knowledge and understanding of a range of biological concepts.  Applies biological concepts highly effectively in new and familiar contexts.  Critically explores and understands in depth the interaction between science and society.  Communicates knowledge and understanding of biology coherently, with highly effective use of appropriate terms, conventions, and representations. |
| B | Logically deconstructs a problem and designs a well-considered and clear biological investigation.  Obtains, records, and represents data, using appropriate conventions and formats mostly accurately and effectively.  Logically analyses and interprets data and evidence to formulate suitable conclusions with reasonable justification.  Logically evaluates procedures and their effect on data. | Demonstrates some depth and breadth of knowledge and understanding of a range of biological concepts.  Applies biological concepts mostly effectively in new and familiar contexts.  Logically explores and understands in some depth the interaction between science and society.  Communicates knowledge and understanding of biology mostly coherently, with effective use of appropriate terms, conventions, and representations. |
| C | Deconstructs a problem and designs a considered and generally clear biological investigation.  Obtains, records, and represents data, using generally appropriate conventions and formats with some errors but generally accurately and effectively.  Undertakes some analysis and interpretation of data and evidence to formulate generally appropriate conclusions with some justification.  Evaluates procedures and some of their effect on data. | Demonstrates knowledge and understanding of a general range of biological concepts.  Applies biological concepts generally effectively in new or familiar contexts.  Explores and understands aspects of the interaction between science and society.  Communicates knowledge and understanding of biology generally effectively, using some appropriate terms, conventions, and representations. |
| D | Prepares a basic deconstruction of a problem and an outline of a deconstruction and biological investigation.  Obtains, records, and represents data, using conventions and formats inconsistently, with occasional accuracy and effectiveness.  Describes data and undertakes some basic interpretation to formulate a basic conclusion.  Attempts to evaluate procedures or suggest an effect on data. | Demonstrates some basic knowledge and partial understanding of biological concepts.  Applies some biological concepts in familiar contexts.  Partially explores and recognises aspects of the interaction between science and society.  Communicates basic biological information, using some appropriate terms, conventions, and/or representations. |
| E | Attempts a simple deconstruction of a problem and a procedure for a biological investigation.  Attempts to record and represent some data, with limited accuracy or effectiveness.  Attempts to describe results and/or interpret data to formulate a basic conclusion.  Acknowledges that procedures affect data. | Demonstrates limited recognition and awareness of biological concepts.  Attempts to apply biological concepts in familiar contexts.  Attempts to explore and identify an aspect of the interaction between science and society.  Attempts to communicate information about biology. |