Stage 2 Earth and Environmental Science

Program 2: Assessment Type 1: Investigations Folio

**Practical Design Investigation**

Purpose: To investigate how changes in the riparian vegetation along a waterway are linked to changes in one particular factor.

In pairs

Select a testable factor. Examples include fish populations, algal growth, water temperature, water flow, and turbidity. Research the role of this factor in the interaction of Earth systems in the area under investigation.

Then deconstruct this problem to formulate a hypothesis to test and determine the most appropriate method for investigation.

In a preliminary visit to the waterway, trial your procedure. Record your observations and make notes about possible modifications to the procedure that could improve the efficiency of collection of data.

Individually

Design your own investigation. Your design should include:

* the independent and dependent variables, factors to be held constant and factors that may not be able to be controlled
* the materials required and a detailed procedure
* a justification of the details of your procedure, using the results of your trial
* identification of ethical and safety considerations.\*

Submit your design for teacher feedback.

In pairs

Select, and carry out, one investigation and record your observations.

Individually

Your practical report should include:

* introduction that includes the hypothesis and variables and a description of the interactions between the Earth systems in the area under investigation
* materials/apparatus\*
* method/procedure outlining the steps to be taken\*
* identification and management of safety and/or ethical risks\*
* results\*
* analysis of results, identifying trends, and linking results to the interactions between the relevant Earth systems
* evaluation of procedures and data, and identifying sources of uncertainty
* conclusion, with justification.

The report should be a maximum of 1500 words or the equivalent in multimodal form.

A summary sheet outlining the deconstruction process should be attached to the report\*. Suggested formats for the summary sheet include flow charts, concept maps, tables or notes.

\*The five asterisked sections of materials/apparatus, method/procedures, risks, results and deconstruction are excluded from the word count.

**Performance Standards for Stage 2 Earth and Environmental Science**

| - | **Investigation, Analysis, and Evaluation** | **Knowledge and Application** |
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| **A** | Designs a logical, coherent, and detailed earth and environmental science 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 earth and environmental science concepts.  Develops and applies earth and environmental science 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 earth and environmental science coherently, with highly effective use of appropriate terms, conventions, and representations. |
| **B** | Designs a well-considered and clear earth and environmental science 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 earth and environmental science concepts.  Develops and applies earth and environmental science 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 earth and environmental science mostly coherently, with effective use of appropriate terms, conventions, and representations. |
| **C** | Designs a considered and generally clear earth and environmental science 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 earth and environmental science concepts.  Develops and applies earth and environmental science concepts generally effectively in new or familiar contexts.  Explores and understands aspects of the interaction between science and society.  Communicates knowledge and understanding of earth and environmental science generally effectively, using some appropriate terms, conventions, and representations. |
| **D** | Prepares the outline of an earth and environmental science 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 earth and environmental science concepts.  Develops and applies some earth and environmental science concepts in familiar contexts.  Partially explores and recognises aspects of the interaction between science and society.  Communicates basic earth and environmental science information, using some appropriate terms, conventions, and/or representations. |
| **E** | Identifies a simple procedure for an earth and environmental science 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 earth and environmental science concepts.  Attempts to develop and apply earth and environmental science concepts in familiar contexts.  Attempts to explore and identify an aspect of the interaction between science and society.  Attempts to communicate information about earth and environmental science. |