2018 Earth and Environmental Science

Subject Assessment Advice

Overview

Subject assessment advice, based on the previous year’s assessment cycle, gives an overview of how students performed in their school and external assessments in relation to the learning requirements, assessment design criteria, and performance standards set out in the relevant subject outline. They provide information and advice regarding the assessment types, the application of the performance standards in school and external assessments, and the quality of student performance.

Teachers should refer to the subject outline for specifications on content and learning requirements, and to the subject operational information for operational matters and key dates.

School Assessment

Assessment Type 1: Investigations Folio

The Investigations Folio contains at least 2 practical investigations and one investigation with a focus on science as a human endeavour.

Both assessment design criteria, Investigation, Analysis and Evaluation, and Knowledge and Application, are used for this assessment type. Student evidence in the Investigations Folio should focus on the science inquiry skills, explain connections with science as a human endeavour and apply science understandings. In at least one practical investigation, students deconstruct a problem and design a method to investigate one aspect of the problem. Students should be encouraged to trial and/or research aspects of their proposed design before they write their final method.

The more successful responses commonly:

* deconstructed open-ended problems that had several possible aspects to explore that allowed opportunities for individual design and investigation of an uncertain outcome
* provided a clear, considered, individual design of an experimental investigation which included a testable hypothesis, independent and dependent variables, and controlled variables
* used research and/or trials to help justify the proposed method for an investigation
* discussed trends and errors specifically in terms of the data collected in practical investigations
* had clear and succinct analysis and evaluation contained within the word count
* were able to justify results that did not show a clear trend in terms of sources of uncertainty
* discussed the validity of the conclusion in reference to the parameters of the investigation
* supported the discussion in the SHE investigation with substantial, well-referenced research
* specifically linked key SHE concepts to examples in the SHE investigation.

The less successful responses commonly:

* were limited by too much scaffolding in the task
* had little opportunity to develop an individual design and very little evidence of the deconstruction of a problem
* had little opportunity to collect data in field work
* had limited justification of the design procedure
* discussed theoretical errors without acknowledging the significance of these on the data collected and hence on the conclusion
* displayed a poor understanding of errors, mistakes, precision and reliability of results
* responded more to theoretical questions rather than discussing the data collected in practical investigations
* did not identify key SHE concepts in the examples chosen for the SHE investigation
* did not explain the interaction between science and society in the SHE investigation
* displayed little higher-order thinking due to very simple tasks that were not at a Stage 2 standard.

Assessment Type 2: Skills and Applications Tasks

A minimum of three tasks is required for this assessment type. These tasks must be done under direct teacher supervision within a maximum time frame of 90 minutes.

Both assessment design criteria, Investigation, Analysis and Evaluation, and Knowledge and Application, are used for this assessment type. Student evidence in the Skills and Applications Tasks should focus on the science understandings, apply science inquiry skills, and explain connections with science as a human endeavour.

The more successful responses commonly:

* used opportunities to present knowledge, understanding, application and analysis in a variety of tasks such as a viva with the teacher, a practical activity or an oral/multimedia presentation
* responded to different question types of varying complexity in new and familiar contexts, thus being able to demonstrate deep understanding
* succinctly analysed and explained data from graphs, diagrams and unfamiliar information sources
* selected and explained SHE concepts from information provided.

The less successful responses commonly:

* responded to questions requiring predominately recall of learned facts. This was particularly noticeable in multiple-choice questions requiring no application of knowledge or considered analysis of information
* responded to questions on concepts/content not covered in this course, such as rock and mineral identification.

# External Assessment

Assessment Type 3: Earth Systems Study

General comments

Students undertake one fieldwork investigation into a local environmental issue, concern, initiative, or successful undertaking that can be linked to topics studied in this course. They submit a proposal and a production report. Students analyse the information gathered in terms of the interactions of two or more of the Earth’s spheres. The specific features used to assess this task are IAE1, IAE2, IAE3, IAE4, KA1 and KA4.

Students should receive feedback from the teacher about their proposal before it is finalised to check the suitability of their hypothesis and that all requirements of the task have been properly considered. Students must individually collect both primary and secondary data for analysis.

The more successful responses commonly:

* provided a considered rationale for the proposed research approach and method
* produced well-designed questions and were able to provide background or previous research relevant to their investigation with appropriate referencing
* included annotated, labelled sketches/ photos of equipment, including detail of how to use these and instructions on how to use test kits
* used only summary data for graphs and tables rather than raw data
* used well-annotated maps and photographs that significantly improved the quality of the analysis
* linked the results of their investigation to findings of previous research
* evaluated their design by explaining how the data collected was affected by their method and suggesting improvements to minimise these effects
* included predictions or advice, based on the results of the investigation, in the conclusion while acknowledging the limitations of the conclusion.

The less successful responses commonly:

* used a question or hypothesis that was either too vague or too complex. This made collection of useful data difficult, which then impacted upon the analysis and conclusion.
* wrote equipment lists that lacked details of the specifications of equipment, making it difficult for anyone else to reproduce the procedure
* did not discuss ethical and legal considerations such as access to property and potential disruption to soil, flora and fauna and sample collection
* provided little background in the introduction in terms of relevant earth and environmental science concepts or research findings
* recorded observations of features that were unrelated to the question/hypothesis
* included sections of work, such as procedures, in an appendix that should have been in the report (note that appendices are not required and are not assessed)
* presented inappropriately formatted tables and graphs
* did not discuss limitations of the procedures, relevant effects of sources of uncertainty on the results and made no suggestions for improvements
* were unable to clearly articulate the interactions of two or more Earth systems. They tended to be superficial, contrived and repetitive.
* used general language rather than earth and environmental science terminology
* presented reports that were research-based rather than based on field work. This reduced the quality of evidence presented that could be assessed against many of the required specific features for this task.