Stage 2 Chemistry – Assessment Type 1: Investigations Folio

Science as a Human Endeavour Investigation – Fossil Fuel Use

This task has a focus on science as a human endeavour; how science interacts with society. Select and explore a recent discovery, innovation, issue, or advancement linked to the global use of fossil fuels. You may select any specific topic linked to the use of fossil fuels.

Some possible contexts include:

* methods to reduce CO2 emissions to the atmosphere
* new technologies to reduce the effects of increased CO2 concentrations in the atmosphere
* alternatives to fossil fuels for production of plastics.

Some specific topics include:

* clean coal technology
* carbon capture and storage
* photovoltaic cell research
* changes in marine mollusc shell properties
* the destruction of the Great Barrier Reef
* renewable resources for production of plastics
* microbes that degrade plastics.

Use one or more of the key concepts of science as a human endeavour to develop a focus for your investigation. Make your topic quite specific to enable you to analyse information in depth. For example:

New carbon capture and storage technologies – sustainable solutions for reducing global warming.

Production of one or more bioplastic materials.

The role of public opinion in the reduction of CO2 emissions to the atmosphere.

Select, analyse and synthesise information from different sources to:

* explain the science relevant to the focus of your investigation
* show its connections to one or more key science as a human endeavour concepts.

Prepare a scientific report, which must include the use of scientific terminology and:

* an introduction to identify the focus of the investigation and the key concept(s) of science as a human endeavour that it links to
* relevant chemistry concepts or background
* an explanation of how the focus of the investigation illustrates the interaction between science and society, including a discussion of the potential impact of the focus of the investigation, e.g. further development, effect on quality of life, environmental implications, economic impact, intrinsic interest
* a conclusion that summarises the connection between your topic and the key concept(s) of science as a human endeavour
* citations and referencing.

The report, which can be in a format of your choice, should be a maximum of 1500 words if written, or a maximum of 9 minutes for an oral presentation, or the equivalent in multimodal form.

Performance Standards for Stage 2 Chemistry

| - | Investigation, Analysis, and Evaluation | Knowledge and Application |
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| A | Critically deconstructs a problem and designs a logical and coherent chemistry investigation with detailed justification.  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 discusses their effect on data. | Demonstrates deep and broad knowledge and understanding of a range of chemical concepts.  Applies chemical 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 chemistry coherently, with highly effective use of appropriate terms, conventions, and representations. |
| B | Logically deconstructs a problem and designs a well-considered and clear chemistry investigation with reasonable justification.  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 chemical concepts.  Applies chemical 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 chemistry mostly coherently, with effective use of appropriate terms, conventions, and representations. |
| C | Deconstructs a problem and designs a considered and generally clear chemistry investigation with some justification.  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 chemical concepts.  Applies chemical concepts generally effectively in new or familiar contexts.  Explores and understands aspects of the interaction between science and society.  Communicates knowledge and understanding of chemistry generally effectively, using some appropriate terms, conventions, and representations. |
| D | Prepares a basic deconstruction of a problem and an outline of a chemistry 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 chemical concepts.  Applies some chemical concepts in familiar contexts.  Partially explores and recognises aspects of the interaction between science and society.  Communicates basic chemical information, using some appropriate terms, conventions, and/or representations. |
| E | Attempts a simple deconstruction of a problem and a procedure for a chemistry 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 chemical concepts.  Attempts to apply chemical concepts in familiar contexts.  Attempts to explore and identify an aspect of the interaction between science and society.  Attempts to communicate information about chemistry. |