## Stage 2 Biology: Assessment Type 1: Investigation Folio

**Science as a Human Endeavour Task**

**Introduction and Purpose of task:**

In this task you will investigate and demonstrate a comprehensive understanding of science as a human endeavour in Biology related to any of the topics in Stage 2 Biology. The focus of this task is to explore an aspect of contemporary Biology with a particular emphasis the interaction between society and, for example, the application and use of biological knowledge, the influence and development of new technologies, or the design of solutions to problems.

You will use and acknowledge a variety of relevant sources to find data and information to support your chosen topic.

You may choose to present your research findings as either an article in a scientific journal, as a written report providing an expert’s point of view, an analysis of a new development in a field or a concern about a development that has economic, social, environmental or political implications on any aspect related to any topic in the Stage 2 Biology science understandings.

Your research, findings and outcome should have a focus on **at least one** of the key concepts of Science as a Human Endeavour listed below:

**Communication and Collaboration**

* Science is a global enterprise that relies on clear communication, international conventions, and review and verification of results.
* Collaboration between scientists, governments and other agencies is often required in scientific research and enterprise.

**Development**

* Development of complex scientific models and/or theories often requires a wide range of evidence from many sources and across disciplines.
* New technologies improve the efficiency of scientific procedures and data collection and analysis. This can reveal new evidence that may modify or replace models, theories, and processes.

**Influence**

* Advances in scientific understanding in one field can influence and be influenced by other areas of science, technology, engineering, and mathematics.
* The acceptance and use of scientific knowledge can be influenced by social, economic, cultural, and ethical considerations.

**Application and Limitation**

* Scientific knowledge, understanding, and inquiry can enable scientists to develop solutions, make discoveries, design action for sustainability, evaluate economic, social, and environmental impacts, offer valid explanations, and make reliable predictions.
* The use of scientific knowledge may have beneficial or unexpected consequences; this requires monitoring, assessment, and evaluation of risk, and provides opportunities for innovation.
* Science informs public debate and is in turn influenced by public debate; at times, there may be complex, unanticipated variables or insufficient data that may limit possible conclusions.

**Part A: Information Search and Planning**

1. Use the internet and other sources of information to do an initial search related to a topic of Stage 2 Biology that is of interest to you e.g. new DNA technologies, animal conservation or new medicines. Consider the technology, ethics, benefit to humans, costs, environmental concerns etc. of this topic of interest.

2. In a table, make a list of possible topics and related questions or contexts for your scientific communication.

3. Search for articles, data or other information that you could use to support your discussion. Record the resources in a reference list using Harvard Referencing, for future reference. This will assist you in your selection of your final focus.

4. Choose the focus of your work for the scientific communication.

e.g. An announcement that a new hormone replacement therapy may prevent breast cancer *or* a breeding program to save one of Australia’s rarest and most unique animals is underway to promote its conservation.

5. Link your chosen focus to **at least one** of the key concepts of SHE.

e.g. The use of scientific knowledge may have beneficial or unexpected consequences; this requires monitoring, assessment, and evaluation of risk, and provides opportunities for innovation could be considered when scientists are involved breeding programs as a method of conserving animals.

6. Check the focus you have chosen with your teacher before you proceed.

Date Due: \_\_\_\_\_\_\_\_\_\_\_\_

7. Choose the format of your work: an article in a scientific journal, as a written report providing an expert’s point of view, an analysis of a new development in a field or a concern about an issue. You might like to formulate a statement that relates to your chosen focus and SHE key concept as the heading for your work.

8. Plan your article or report - this will be submitted to your teacher for feedback.

Date Due: \_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Part B: Refinement of Information for your chosen focus**

9. Search for any further information that will enable you to provide a comprehensive and detailed report, with highly relevant biology as determined by your plan from Part A.

This will also assist you in developing your conclusion.

Record the resources in a reference list use Harvard Referencing.

Part A and B are not included in the word count.

**Part C: Scientific Communication**

Use the information and data gathered to write an article in a scientific journal, a report providing an expert’s point of view, an analysis of a new development in a field or a concern about an issue you have chosen.

Your report *must* include:

* 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 biology concepts or background (***this should support your report but not be the focus which is Science as a Human Endeavour***)
* an explanation of how the focus of the investigation illustrates the interaction between science and society, including a discussion of the purpose, potential impact, or application of the focus of the investigation, e.g. further development, effect on quality of life, environmental implications, economic impact, intrinsic interest
* a conclusion
* citations and referencing.

**Assessment Conditions:**

4 weeks to complete. Class time provided for research and support.

Students may submit one draft of the final scientific communication for feedback. This does not include the checkpoints and plan.

Verification of student work will occur throughout the task.

Word Count: maximum of 1500 words for Part C or 9 minutes for an oral presentation.

**Assessment Design Criteria**

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| **Note for teachers:**  This format of the SHE task provides the student with an opportunity to select a topic and explore the SHE key concepts connected to their chosen topic. Teachers will need to guide students to select topics that are contemporary and will enable the focus to be on the aspects of SHE chosen. |
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| While the biology and science involved will be a part of the report it should not be the focus. The assessment focus should be on the student’s ability to explore and connect the interaction between science and society.  Part A and B are not included in the 1500 word count. |
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Knowledge and Application: KA1, 3, 4

**Stage 2 Biology Performance Standards**

| - | Investigation, Analysis, and Evaluation | Knowledge and Application | |
| --- | --- | --- | --- |
| A | Critically deconstructs a problem and designs a logical and coherent biological 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 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 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 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 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 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 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. | |