# Sample Assessment Task Year 11 Biology

## Sample for implementation for Year 11 from 2018

### Context

A fieldwork exercise has been conducted where water samples from freshwater and marine-water sources were collected. The collection of water was determined by the class with respect to location and depth of samples. Students observed samples under dissecting microscopes and light microscopes to classify a range of microorganisms and macroorganisms found at each water source.

After the initial field study, inquiry questions related to the water samples and the fauna and/or flora found in the samples were posed and a hypothesis was developed and tested.

This task could be used as the assessment of a depth study.

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| Task number: 1 | Weighting: 30% | Timing: Term 2, Week 6 |
| Outcomes assessed A student:   * develops and evaluates questions and hypotheses for scientific investigation BIO11/12-1 * designs and evaluates investigations in order to obtain primary and secondary data and information BIO11/12-2 * analyses and evaluates primary and secondary data and information BIO11/12-5 * communicates scientific understanding using suitable language and terminology for a specific audience or purpose BIO11/12-7 * describes single cells as the basis for all life by analysing and explaining cells’ ultrastructure and biochemical processes BIO11-8 * explains the structure and function of multicellular organisms and describes how the coordinated activities of cells, tissues and organs contribute to macroscopic processes in organisms BIO11-9 | | |
| Nature of the task This student task is in two parts.  A student:   * conducts an investigation in the form of fieldwork * presents a four to five-minute synopsis of the investigation to the class   A student:   * develops an inquiry question * designs a practical investigation that will answer their inquiry question. (Equipment available: dissecting microscopes, light microscopes, petri dishes, dissecting equipment, 1 mL pipettes, measuring cylinders, spoons, sieves. Chemical test kits can be requested to test pH, for example. You will not be permitted to grow bacteria on agar plates). * engages in peer feedback to review their investigation design * carries out the investigation * locates suitable secondary sources that can be used to assist in the investigation and the analysis of the results from the investigation * communicates their findings in a practical report | | |
| Marking criteriaKnowledge and Understanding – 10 marks Students:   * **describe single cells as the basis for all life by analysing and explaining cells’ ultrastructure and biochemical processes BIO11-8** * identify organisms in terms of their cellular structure * describe the biochemical processes that are required for the survival of organisms * **explain the structure and function of multicellular organisms and describe how the coordinated activities of cells, tissues and organs contribute to macroscopic processes in organisms BIO11-9** * identify and describe some organisms that exist as single cells, colonies of cells and multicellular organisms * explain the cellular and biochemical characteristics that allow organisms to exist in many different forms * explain the differences between cellular interactions in unicellular, colonial and multicellular organisms  Questioning and Planning Investigations – 15 marks Students:   * **develop and evaluate questions and hypotheses for scientific investigation BIO11/12-1** * develop and evaluate inquiry questions and hypotheses to identify a concept that can be investigated scientifically, involving primary and secondary data * modify questions and hypotheses to reflect new evidence * **design and evaluate investigations in order to obtain primary and secondary data and information BIO11/12-2** * assess risks, consider ethical issues and select appropriate materials and technologies when designing and planning an investigation * justify and evaluate the use of variables and experimental controls to ensure that a valid procedure is developed that allows for the reliable collection of data * evaluate and modify an investigation in response to new evidence  Analysis and Communicating – 15 marks Students:   * **analyse and evaluate primary and secondary data and information BIO11/12-5** * derive trends, patterns and relationships in data and information * assess error, uncertainty and limitations in data * assess the relevance, accuracy, validity and reliability of primary and secondary data and suggest improvements to investigations * **communicate scientific understanding using suitable language and terminology for a specific audience or purpose BIO11/12-7** * select and use suitable forms of digital, visual, written and/or oral forms of communication * select and apply appropriate scientific notations, nomenclature and scientific language to communicate in a variety of contexts * construct evidence-based arguments and engage in peer feedback to evaluate an argument or conclusion | | |
| Feedback provided To inform your future learning your feedback will consist of:   * an annotated marking guidelines sheet * annotations on your submitted work | | |

### Marking Guidelines

| Outcome | Developing | Elementary | Substantial | High |
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| **BIO11-8** **describes single cells as the basis for all life by analysing and explaining cells’ ultrastructure and biochemical processes**  **Maximum marks 4** | * identifies cells as the basic units of life   **Marks 1** | * identifies a range cells describing their cellular structure * identify that different parts of the cell have different functions   **Marks 2** | * provides labelled diagrams of a range of observed unicellular organisms * describes how specific cellular structures affect function of different unicellular organisms   **Marks 3** | * provides labelled diagrams of a range of observed unicellular organisms * explains how specific cellular structures carry out specific biochemical reactions   **Marks 4** |
| **BIO11-9** **explains the structure and function of multicellular organisms and describes how the coordinated activities of cells, tissues and organs contribute to macroscopic processes in organisms**  **Maximum marks 6** | * identifies a number of organisms displaying different cellular arrangements   **Marks 1** | * identifies a range of organisms displaying different cellular arrangements * describes how cellular arrangements may affect the structure or function of different organisms   **Marks 2–3** | * provides labelled diagrams of a range of observed organisms displaying different cellular arrangements * describes how specific cellular arrangements affect the structure or function of different organisms   **Marks 4–5** | * provides labelled, scaled diagrams of a range of observed organisms displaying different cellular arrangements * explains how specific cellular arrangements affect the structure and function of different organisms   **Marks 6** |
| **BIO11/12-1** **develops and evaluates questions and hypotheses for scientific investigation**  **Maximum marks 5** | * requires teacher assistance to develop a question for investigation   **Marks 1** | * develops a simple question for investigation * plans secondary research * can alter investigation question in response to evidence   **Marks 2** | * develops a clear question for investigation * plans and carries out secondary research * modifies questions in response to evidence   **Marks 3–4** | * develops a substantive question for investigation * plans and carries out significant secondary research * refines investigation question in response to evidence, where applicable   **Marks 5** |
| **BIO11/12-2** **designs and evaluates investigations in order to obtain primary and secondary data and information**  **Maximum marks 10** | * identifies variables correctly * chooses appropriate equipment   **Marks 1–3** | * chooses appropriate equipment to complete the practical investigation * identifies variables correctly, including a number of controlled variables * modifies the method as a result of testing   **Marks 4–5** | * chooses appropriate equipment to complete the practical investigation * assesses risks * justifies the selection of variables * modifies the investigation in response to new evidence   **Marks 6–8** | * chooses appropriate equipment to complete the practical investigation * assesses risks and considers a range of issues * justifies and evaluates the selection of variables * evaluates and modifies the investigation in response to new evidence   **Marks 9–10** |
| **BIO11/12-5 Analyses and evaluates primary and secondary data and information**  **Maximum marks 5** | * presents data with limited analysis   **Marks 1** | * states trends, patterns and relationships in data and information with limited analysis * states errors, uncertainty and limitations in data   **Marks 2** | * derives trends, patterns and relationships in data and information * assesses error, uncertainty and limitations in data * assesses validity and reliability of the investigation   **Marks 3–4** | * derives trends, patterns and relationships in data and information * assesses error, uncertainty and limitations in data * assesses the relevance, accuracy, validity and reliability of primary and secondary data and suggests improvements to investigations   **Marks 5** |
| **BIO11/12-7 Communicates scientific understanding using suitable language and terminology for a specific audience or purpose**  **Maximum marks 10** | * presents limited information   **Marks 1–2** | * communicates basic information through descriptive texts * uses some scientific terminology   **Marks 3–5** | * presents a well-organised report * selects and uses suitable forms of digital, visual written and/or oral forms of communication * selects and applies appropriate nomenclature and scientific language to communicate   **Marks 6–8** | * presents a logical, well-organised report * uses effective forms of digital, visual written and oral forms of communication * uses scientific language to communicate comprehensive knowledge * supports conclusions/ideas with evidence   **Marks 9–10** |