

2023

Year 11 Integrated Science – Unit 1 Biological & Earth Systems

Task 3: Bacteria Investigation

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| **Assessment Type:** |  | Name: |  |
| Investigation |  |
| **Duration & Conditions:**  See section notes |  | Teacher: |  |
|  |  |  |  |
| **Assessment weighting:**  12.5% of year mark |  | Date: |  |

**AIM:** To plan and conduct an investigation into the effect of an environmental variable (pH) on bacteria growth.

# **ASSESSMENT BREAKDOWN:**

You will have multiple lessons over three weeks to complete this assessment. The assessment involves planning an experiment, conducting the experiment, analysing the results and writing a scientific report.

# **PART ONE:** Planning

Use your knowledge of scientific method to design an experiment which investigates the impact of pH on bacteria.

You will need to identify the following experiment components:

* Aim
* Hypothesis
* Independent, dependent and controlled variables
* Method

# **PART TWO:** Conducting the experiment

You need to perform your experiment and record any data relevant to the experimental aim.

# **PART THREE:** Scientific report

Your report needs to include the following components:

* *Introduction* – Background information which outlines any relevant background information about the experiment. Contains the experiment aim and hypothesis.
* *Materials* – List and quantity of specific materials used to conduct experiment
* *Method* – Set of instructional steps that someone else could follow to replicate the experiment
* *Results* – Present all observations and measurements as well as tables and graphs where appropriate.
* *Discussion* – Discuss your results with reference to your hypothesis and background research. Attempt to identify and explain any of the trends your results may (or may not) show. Explain any problems that arose, as well as any potential improvements that could be made.
* *References* – Reference list of researched sources to be included, using APA referencing style.

# **TO BE SUBMITTED:**

* Part 1: Planning
* Part 3: Scientific Report

# **PART ONE:** Planning

1. **Aim**: What is the aim of the experiment?
2. Based on your knowledge of bacteria, what do you think that impact of pH on bacteria will be?
3. **Independent variable**: Identify the independent variable in your experiment (the factor you will manipulate).
4. **Dependent variable**: Identify the dependent variable in your experiment (the factor you will measure or observe).
5. **Control variables**: List the variables that you need to keep constant to ensure a fair test. These are variables that could answer impact bacteria growth and need to stay the same for all trials.
6. **Hypothesis**: Based on your answers to Q2 to 5, formulate a hypothesis that predicts the relationship between pH and bacterial growth.
7. **Materials**:List all the materials and equipment you need to conduct the experiment.
8. **Replication:** Experiments, especially in biology, are often repeated to ensure reliable and consistent results. Describe how you will repeat the experiment and for how many times.
9. **Method**: Write a step-by-step procedure for your experiment, including how you will change the independent variable, measure the dependent variable, and control other variables.
10. **Safety**: Identify any potential hazards or risks associated with the experiment and list the safety measures you will take to minimize them.
11. **Data Analysis**: Explain how you will collect and analyse data from your experiment.