SUBMISSION INSTRUCTIONS

You will be assessed on a Depth Study on Module 1: Cells as the Basis of Life. During Week 5 and 6, you will carry out a series of scientific investigations in class to observe the effects of the environment on enzyme activity. You will then be expected to gather background research and write-up a scientific report on your chosen investigation.

Your Depth Study journal is to be printed off and handed in to your teacher at the beginning of your Biology lesson on Wednesday 20th March, 2019.

Refer to the Assessment and Reporting Policy Handbook for absences due to illness and misadventure.

CONTEXT (OR PURPOSE) FOR THE TASK

In order to demonstrate the skills required in first-hand investigations, students will undertake a practical examination. The examination will challenge students to plan and conduct a series of first-hand investigations, as well as requiring them to apply their knowledge and understanding to these investigations.

TASK RUBRIC

Students will be assessed on how well they:

- Demonstrate knowledge and understanding relevant to the question
- Apply scientific problem thinking skills
- Communicate using relevant scientific terminology and concepts
- Present a logical and cohesive response

OUTCOMES BEING ASSESSED, GENERAL CAPABILITIES & CROSS CURRICULUM PRIORITIES

<table>
<thead>
<tr>
<th>BIO11-1</th>
<th>develops and evaluates questions and hypotheses for scientific investigation</th>
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<tbody>
<tr>
<td>BIO11-2</td>
<td>designs and evaluates investigations in order to obtain primary and secondary data and information</td>
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<tr>
<td>BIO11-3</td>
<td>conducts investigations to collect valid and reliable primary and secondary data and information</td>
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<tr>
<td>BIO11-4</td>
<td>selects and processes appropriate qualitative and quantitative data and information using a range of appropriate media</td>
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<tr>
<td>BIO11-5</td>
<td>analyses and evaluates primary and secondary data and information</td>
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<tr>
<td>BIO11-7</td>
<td>communicates scientific understanding using suitable language and terminology for a specific audience or purpose</td>
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<tr>
<td>BIO11-8</td>
<td>describes single cells as the basis for all life by analysing and explaining cells’ ultrastructure and biochemical processes</td>
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THE TASK

During Week 5 and 6 (Term 1) you will partake in a **Depth Study** on **Enzymes**. You will design and conduct a series of scientific investigations in class to observe and collect data on the effect of the environment (i.e. temperature, pH and substrate concentration) on enzyme activity.

You are then required to communicate the results of **one** selected investigation in a **Depth Study journal**.

Your Depth Study journal **must** include the following:

- a title stating the question being investigated
- scientific background information on the topic (350-500 words)
- a complete scientific report:
  - aim
  - hypothesis
  - materials
  - risk assessment
  - method
  - diagram of experimental set-up (labelled)
  - results (table and graph)
  - discussion
  - conclusion
- a bibliography (Harvard style referencing- See Page 148 of your Student diary)
## MARKING CRITERIA

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<thead>
<tr>
<th>Marks allocation</th>
<th>0-3</th>
<th>4-6</th>
<th>7-9</th>
<th>10-12</th>
<th>13-15</th>
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</thead>
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### Knowledge and understanding

| Background Research | Demonstrates a limited knowledge and understanding of enzymes, their functions, and the effect of environmental pressures on their activity, using scientific language | Demonstrates a basic knowledge and understanding of enzymes, their functions, and the effect of environmental pressures on their activity, using scientific language | Demonstrates a sound knowledge and understanding of enzymes, their functions, and the effect of environmental pressures on their activity, using scientific language | Demonstrates a thorough knowledge and understanding of enzymes, their functions, and the effect of environmental pressures on their activity, using scientific language | Demonstrates an extensive knowledge and understanding of enzymes, their functions, and the effect of environmental pressures on their activity, using scientific language |

### Skills in Working Scientifically

| Designing a First-hand Investigation to answer a developed question | Demonstrates limited skills in designing a first-hand investigation (i.e. aim, hypothesis, materials, risk assessment, method, experimental set-up) to answer a developed question on enzyme activity | Demonstrates basic skills in designing a first-hand investigation (i.e. aim, hypothesis, materials, risk assessment, method, experimental set-up) to answer a developed question on enzyme activity | Demonstrates sound skills in designing a first-hand investigation (i.e. aim, hypothesis, materials, risk assessment, method, experimental set-up) to answer a developed question on enzyme activity | Demonstrates thorough skills in designing a first-hand investigation (i.e. aim, hypothesis, materials, risk assessment, method, experimental set-up) to answer a developed question on enzyme activity | Demonstrates extensive skills in designing a first-hand investigation (i.e. aim, hypothesis, materials, risk assessment, method, experimental set-up) to answer a developed question on enzyme activity |

### Communication and Analysis of data

| Demonstrates limited skills in presenting data (results table and graph), scientific discussion (i.e. trends analysis, assessment of reliability, accuracy and validity, suggestions for improvements), conclusion and creating a bibliography | Demonstrates basic skills in presenting data (results table and graph), scientific discussion (i.e. trends analysis, assessment of reliability, accuracy and validity, suggestions for improvements), conclusion and creating a bibliography | Demonstrates sound skills in presenting data (results table and graph), scientific discussion (i.e. trends analysis, assessment of reliability, accuracy and validity, suggestions for improvements), conclusion and creating a bibliography | Demonstrates thorough skills in presenting data (results table and graph), scientific discussion (i.e. trends analysis, assessment of reliability, accuracy and validity, suggestions for improvements), conclusion and creating a bibliography | Demonstrates extensive skills in presenting data (results table and graph), scientific discussion (i.e. trends analysis, assessment of reliability, accuracy and validity, suggestions for improvements), conclusion and creating a bibliography |