Coonabarabran High School
Assessment Notification

Subject: Year 11 Biology	**Date of Notification:** Tuesday 22nd May, 2018
Assessment task 2: Depth study	**Due date: Friday 15th June, 2018**
Weighting: 35%	**Teacher:** Miss Christoff

Outcomes to be assessed

This assessment task will allow you to show evidence of having achieved the following course outcomes:

BIO11/12-1 develops and evaluates questions and hypotheses for scientific investigation
BIO11/12-2 designs and evaluates investigations in order to obtain primary and secondary data and information
BIO11/12-5 analyses and evaluates primary and secondary data and information
BIO11/12-6 solves scientific problems using primary and secondary data, critical thinking skills and scientific processes
BIO11/12-7 communicates scientific understanding using suitable language and terminology for a specific audience or purpose
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

Task 2 – Depth study

A depth study is any type of investigation/activity that allows the further development of one or more concepts found within or inspired by the syllabus. Depth studies provide opportunities for students to pursue their interests in biology, acquire a depth of understanding, and take responsibility for their own learning.

Your task is to carry out a depth study on one or more concepts within or inspired by Module 2: Organisation of living things. Your investigation must include both research from secondary sources and a first-hand investigation. You will submit a scientific report on your investigation.

Step 1 Choose an area of research from Module 2;

- Comparing unicellular, colonial and multicellular organisms.
- Cell differentiation and specialisation
- Organisation of cells in multicellular organisms
- Nutrient requirements of heterotrophs (eg. animal digestive systems)
- Gas exchange in animals (respiratory systems)
- Transport systems in animals (circulatory systems)

- Nutrient requirements of plants
- Gas exchange in plants
- Transport system in plants

Step 2 Propose a research question
Define a research question. A research question needs to be specific enough to guide the design of your investigation. Once you have decided on your research question, further reading will guide you to design a suitable experiment.

Step 3 Conduct background research
Background research helps you to:

- increase your breadth of knowledge and identify what is and is not known about an area or research.
- learn from others and identify methods that could be relevant to your investigation (avoid reinventing the wheel and/or making the same mistakes as others.)
- identify the variety of different views in an area of research and consider how these fit in with your own views.

Step 3 Develop a hypothesis that is supported by your background research
Decide on what specifically you will be changing (independent variable/s) and exactly what you will measure (dependent variable/s). The research question from Step 2 can now be turned into a hypothesis.

Step 4 Design your first-hand investigation and assess the risks
When designing your first-hand investigation consider if your design will produce data that is:

- Reliable – is the experiment repeatable? Will the results be similar each time?
- Accurate – what equipment will give the most accurate measurements? How can you reduce mistakes and errors in measurements?
- Valid – can you control all the variables that need to be kept constant? Do you need a control? Do your independent and dependent variables relate to your hypothesis?

Carry out a risk assessment.

Step 5 Carry out your first-hand investigation
When carrying out your first-hand investigation ensure you implement the safe work practices you identified in your risk assessment.
Trial your procedure and make necessary modifications.
Record your results in an appropriate way (tables are usually best).

Step 6 Analyse and interpret your results

Calculate averages.
Can you present your data in a graph? What type of graph is appropriate?
What trends or patterns are in your data?
Do your results support your hypothesis?

Step 7 Write a scientific report about your investigation

Use the scientific report format to communicate the findings of your investigation. Below are the key subsections to include in your report.

Introduction – Gives the background information needed to understand the area of the investigation Reference all sources correctly (Author, date). Explain why this research is interesting, why you did this investigation, how you developed your research question or hypothesis.

Aim – what you intended to do. It should be brief and it should link with the hypothesis.
"To ……..."

Hypothesis – Written as a predictive statement stating your expected result, and it must be falsifiable (that is, it must be able to be disproved). "If …… then ……."

Risk assessment – RIP table (Risk, injury/incident, prevention)

Materials – list all the materials and equipment needed (including quantities and concentrations)

Method – describes how you carried out your first-hand investigation in enough detail that someone with a similar knowledge level could repeat what you did. It should include large, clear diagrams of equipment set-up.

Results- This section is a summary of your results. Usually present in tables, graphs and/or labelled diagrams. Avoid including long tables of raw data in your report (they go in the appendix). In your report use averages. Include the correct units for all measurements.

Discussion – Summarises what your results mean. State whether or not your results support your hypothesis. If your investigation led to more questions, say what further work could be done to answer those questions.

Conclusion – A brief summary of the results and their implications. A conclusion should only be a few sentences long and should not contain any inferences. Make sure your conclusion relates back to your aim and hypothesis.

Acknowledgements – thank people who helped with your investigation eg. supplied equipment, gave you good ideas or helped with the analysis.

Reference list – Details the sources of all information that were actually used to write the report (they should appear in your in-text (Author, date) referencing within your report). Use APA format.

Appendix – include all your raw data

Tips:

- Pick a topic that interests you.
- Review Bio Skill Drills (completed in term 1) and the depth study we did on enzymes.
- Use your time in class productively, don't waste time.
- You need to do research using secondary sources. It is a **depth** study. You need to learn more about the topic than what we did in class.
- Reference as you go - use the References tool in Microsoft Word to record where ideas/information came from
- Keep a record of people who give you ideas so that you remember to acknowledge them. When writing your acknowledgements, it is best if you can say exactly how they helped you as a part of your thank you.

Depth study timeline