



Biology - HSC COURSE

Assessment Task: First-hand Investigation- Practical report

Date to be completed: Week 4 Term 1 2022 (Day to be advised)

Worth: 30% (5% knowledge 25% working scientifically)

Outcomes to be assessed from the Syllabus:

HSC outcomes	A student:
BIO12 – 1	Develops and evaluates questions and hypotheses for scientific investigation
BIO12 – 2	Designs and evaluates investigations in order to obtain primary and secondary data and information
BIO12 – 3	Conducts investigations to collect valid and reliable primary and secondary data and information
BIO12 – 5	Analyses and evaluates primary and secondary data and information
BIO12– 6	Solves scientific problems using primary and secondary data, critical thinking skills and scientific processes
BIO12-12	explains the structures of DNA and analyses the mechanisms of inheritance and how processes of reproduction ensure continuity of species

Task Outcome Details

Students:

- 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 (ACSBL002)
- conducts investigations to collect valid and reliable primary and secondary data and information BIO11/12-3
- derive trends, patterns and relationships in data and information
- assess error, uncertainty and limitations in data (ACSBL004, ACSBL005, ACSBL033, ACSBL099) ⚙️
- assess the relevance, accuracy, validity and reliability of primary and secondary data and suggest improvements to investigations (ACSBL005) ⚙️
- explain the mechanisms of reproduction that ensure the continuity of a species, by analysing sexual and asexual methods of reproduction in a variety of organisms, including but not limited to:
 - plants: asexual and sexual reproduction
 - fungi: budding, spores
- model the processes involved in cell replication, including but not limited to:
 - mitosis and meiosis (ACSBL075) ⚙️ 🖨️
- model the process of polypeptide synthesis, including: (ACSBL079)
 - transcription and translation
 - analysing the function and importance of polypeptide synthesis (ACSBL080)

- conduct practical investigations to predict variations in the genotype of offspring by modelling meiosis, including the crossing over of homologous chromosomes, fertilisation and mutations (ACSBL084)
- model the formation of new combinations of genotypes produced during meiosis, including but not limited to:
 - interpreting examples of autosomal, sex-linkage, co-dominance, incomplete dominance and multiple alleles (ACSBL085) ⚙️
 - constructing and interpreting information and data from pedigrees and Punnett squares
- collect, record and present data to represent frequencies of characteristics in a population, in order to identify trends, patterns, relationships and limitations in data, for example: 📊 📄
 - examining frequency data

Task Details:

You will need to:

- **Conduct an experiment that models inheritance or protein production**
- **Have some knowledge of how to communicate scientifically the inheritance of genes in families. Pedigrees and Punnett squares.**
- **Identify variables, experimental controls and judge the validity of a scientific method**
- **Appropriately record collected data and describe trends. Identify and explain the reliability, validity and accuracy of collected data.**
- **Construct a graph and/or a scientific table**
- **Answer questions on the collection data from experiments to identify trends, discuss results, identifying errors and make appropriate scientific conclusions.**
- **Interpret a variety of stimuli and apply your knowledge to answer questions relating to heredity.**