



JOHN EDMONDSON HIGH SCHOOL

Assessment Notification

Faculty: Science Course: HSC Biology Year: 12

Assessment Task: Genetics Depth Study

Assessment Weighting: 20% Due: Term 1 Week 8 Date: 13/3/23

Task Type: Hand in Task In Class Task Practical Task

Outcomes assessed (NESA)

BIO11/12-1 develops and evaluates questions and hypotheses for scientific investigation
BIO11/12-4 selects and processes appropriate qualitative and quantitative data and information using a range of appropriate media
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
BIO12-13 explains natural genetic change and the use of genetic technologies to induce genetic change

Biotechnology

How do genetic techniques affect Earth's biodiversity?

Students:

- Investigate the uses and applications of biotechnology (past, present, and future), including: (ACSBL087)
- analysing the social implications and ethical uses of biotechnology, including plant and animal examples.
- researching future directions of the use of biotechnology.
- evaluating the potential benefits for society of research using genetic technologies.
- evaluating the changes to the Earth's biodiversity due to genetic techniques.

Genetic Technologies

Does artificial manipulation of DNA have the potential to change populations forever?

Students:

- Investigate the uses and advantages of current genetic technologies that induce genetic change.
- Compare the processes and outcomes of reproductive technologies, including but not limited to: – artificial insemination and artificial pollination.
- Investigate and assess the effectiveness of cloning, including but not limited to: – whole organism cloning and gene cloning.
- Describe techniques and applications used in recombinant DNA technology, for example: – the development of transgenic organisms in agricultural and medical applications. (ACSBL087)
- Evaluate the benefits of using genetic technologies in agricultural, medical, and industrial applications. (ACSBL086)
- Evaluate the effect on biodiversity of using biotechnology in agriculture.
- Interpret a range of secondary sources to assess the influence of social, economic and cultural contexts on a range of biotechnologies

Task Description/Overview

Individually, students will complete a depth study on the different types of biotechnology available today, and the implications of genetic biotechnology on population size.

In the research report, students will focus on the two questions below:

- How do genetic techniques affect Earth's biodiversity?
- Does artificial manipulation of DNA have the potential to change populations forever?

You will be provided 4 lessons in class to complete research on your depth study and gain feedback on your progression. Using the information collected from your research, students will write a 'Research Report' on the implications (advantages and disadvantages) of genetic biotechnology on population size and biodiversity.

The depth study is a TOTAL of 60 marks.

If you are sick/late on the day of submission, an illness misadventure form MUST be submitted.

A mark of zero will be given if the research report is plagiarised and not in your own words.

Submit your task on CANVAS before 8am on the 13/3/23.

Detailed Assessment Task Description

Research Report:

Submit your task on CANVAS before roll call at 8:00am on the 13/3/23.

You will conduct an investigation on the different types of biotechnology (past, present, and future) and analyse the implications on society, economy, agriculture, industry and medicine.

In your report you will choose **ONE** of these biotechnologies to investigate:

- Recombinant DNA technologies
- Cloning technique
- Artificial insemination

Once you have chosen a biotechnology to focus your report on, you are required to address the following (in order):

1. Name the technology and describe how it works **(3 marks)**
2. Create a flow diagram to show the process of your biotechnology in simple terms. This includes a title, labelling the parts/steps of the technology, defining new terms, and briefly outline the role of each part of the system correctly and clearly. **(8 marks)**
3. Explain the potential benefits of using the technology on factors of society, industry, agriculture, medicine, and economy. **(6 marks)**
4. Explain the potential disadvantages of the technology on factors of society, industry, agriculture, and medicine. **(5 marks)**
5. Suggest the implications of your chosen technology for the future in relation to biodiversity and population size. **(4 marks)**
6. Assess social implications from past, present, and future (social, equality, accessibility, and economic factors) of your chosen technology. Provide 3 examples and include a judgement on the social implications. **(10 marks)**
7. Explain the potential risks involved for your chosen technology and how they can be detrimental to a sector of society today or in the future. **(5 marks)**

8. Explain the ethical (philosophical, cultural, privacy considerations and religious views) that may be associated with the use of your chosen technology. Provide a minimum of 3 examples to support your response. **(8 marks)**

Conclusion: (5 marks)

Summarise the information that you investigated and then answer the question below.

“Does artificial manipulation of DNA have the potential to change populations forever and affect the Earth’s biodiversity/why?”

Bibliography: (6 marks)

Your research report must include a **minimum of 5 resources**. These references **MUST** be **clearly listed in APA style** as per the school website.

Resources:

Students will be allocated 4 lessons in class to work through their depth study. As a class you will choose the dates to work on your assessment and fill in the table below.

Lesson:	Date:	Period:
Lesson 1		
Lesson 2		
Lesson 3		
Lesson 4		

Assessment Criteria		
Grade	Description	Mark Range
Outstanding (O)	The student has an extensive knowledge and understanding of the content and can readily apply this knowledge. In addition, the student has achieved a very high level of competence in the processes and skills and can apply these skills to new situations.	84.5-100
High (H)	The student has a thorough knowledge and understanding of the content and a high level of competence in the processes and skills. In addition, the student is able to apply this knowledge and these skills to most situations	69.5-84
Sound (S)	The student has a sound knowledge and understanding of the content and has achieved a good level of competence in the processes and skills	49.5-69
Basic (B)	The student has a basic knowledge and understanding of the content and has achieved a basic level of competence in the processes and skills.	27.5-49
Limited (L)	The student has an elementary knowledge and understanding in a few areas of the content and still requires further work to achieve competence in the processes and skills	0-27

Satisfactory completion of courses

A course has been satisfactorily completed when the student has:

- Followed the course developed/endorsed by the NSW Educational Standards Authority (NESA)
- Applied himself/herself with diligence and sustained effort to the set tasks and experiences provided in the course.
- Achieved some or all of the course outcomes