JOHN EDMONDSON HIGH SCHOOL
Assessment Notification

Faculty: Science Course: HSC Biology Year: 12

Assessment Task: Depth Study Task

Assessment Weighting: 20% Due: Term 1 Week 8 Date: 21/03/2024

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 – artificial pollination ● investigate and assess the effectiveness of cloning, including but not limited to: – whole organism cloning – 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

TOTAL: 75 MARKS
Students:

- Will complete a **Research Report** which will form part of an In-Depth study of the different Genetic Technologies.
- Will present their findings on a chosen Biotechnology in the form of an **Infographic poster**.
- Will complete an **In-Class Test** on the day the assessment is due (p1-2, on 21/3/2024)

If you are sick/late on the day of submission and presentation, an illness and misadventure form will need to be submitted to your Deputy Principal.

A mark of Zero will be given if work is plagiarised and not in your own words. Submit your Research Report on CANVAS and check your Turnitin score.

PART A: 23 Marks

1. **Research Report**

Submission on **CANVAS before Roll call 8:25am**

Conduct Research on Biotechnologies in the following areas:

1. **Reproductive technology** (*such as artificial insemination, artificial pollination, and IVF*)
2. **Cloning technique** (*such as whole organism cloning, gene cloning*)
3. **Recombinant DNA technique** (*such as gene therapy, CRISPR, Transgenesis)*

Choose ANY ONE of the above biotechnologies and address the following points:

1. Describe the biotechnology. (2)
2. Prepare a flowchart to outline the process in simple terms. This will involve presenting the technology, labelling its parts, and briefly outlining the role of each part of the system. Remember to define new terms. Include diagrams. (5)
3. Explain the applications (in medical, industrial or agriculture field) of this biotechnology. (3)

You may use multiple areas of biotechnologies (mentioned above) to address the following questions:

4. Assess social implications (*social equality, accessibility, and cost factors*) of biotechnologies in the above mentioned three areas. Give examples and include a judgement. (5)
5. Explain the loss of biodiversity that may result from TWO biotechnologies used in agriculture. (5)

2. **Bibliography: 3 marks**

At least 5 different resources are referenced as per the school website. (3 marks)

PART B:
Infographic Poster:12 Marks

Poster Size: A3 Size

Submission in D04 before Roll Call

Design an infographic poster on your **CHOSEN BIOTECHNOLOGY (a different one from PART A)** which should include the following information:

-Name the technology and describe the process in steps using graphics. (3)
-Relevant medical and /or agricultural and/ or industrial applications of the technology. (3)
-List any limitations of the technology (2)
-Include relevant images and/or diagrams to visually enhance your infographic poster to support research (layout, use of diagrams, data included) (4)

PART C:
In Class-Test: 40 marks

Period 1 and Period 2 in D03 and D04

You will complete the test, consisting of multiple-choice questions and short/extended responses, based on the following Inquiry questions in Module 6:

IQ2 Biotechnology: How do genetic techniques affect Earth's biodiversity?

IQ3 Genetic Technologies: Does artificial manipulation of DNA have the potential to change populations forever?

Resources
You will be allocated **4 lessons** for this Depth Study Task.

Total Marks: 75

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