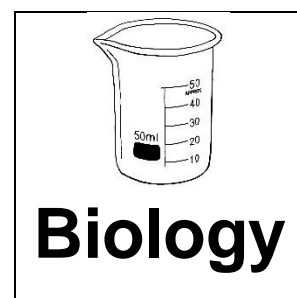




Depth study



Subject:	Biology
Year:	12
Task:	1
Due Date:	13.12.19
Mark:	120
Weighting:	25%
Assessment Mode:	Depth Study

Outcomes

- conducts investigations to collect valid and reliable primary and secondary data and information BIO11/12-3
- analyses and evaluates primary and secondary data and information BIO11/12-5
- solves scientific problems using primary and secondary data, critical thinking skills and scientific processes BIO11/12-6
- communicates scientific understanding using suitable language and terminology for a specific audience or purpose BIO11/12-7
- explains the structures of DNA and analyses the mechanisms of inheritance and how processes of reproduction ensure continuity of species BIO12-12
- assess the effect of the cell replication processes on the continuity of species (ACSBL084)
- construct appropriate representations to model and compare the forms in which DNA exists in eukaryotes and prokaryotes (ACSBL076)
- investigate the structure and function of proteins in living things

Submission / Late Policy

Students are expected to submit their assessment tasks during the period the class meets on the due date. Students submitting assessment tasks at the staff room should only submit these tasks to their teacher or a nominated representative from the faculty. If the task is collected by anyone else the student **MUST** ask for a signed submission receipt.

Year 11-12 students will receive a zero for failing to submit their assessment task by the due date unless they have a doctor's certificate stating the nature of their absence. This is in line with NESAs ACE manual.

If you are absent on the due date you must submit the assessment task with a doctor's certificate on the first day that you return to school, whether you have the class or not. Failure to supply a doctor's certificate may result in a zero being awarded for the task

Assessment Task Year 12 Biology

Context

Students are able to use this task as an assessment for learning to research information that will aid their response to the inquiry question 'Why is polypeptide synthesis important?' The steps involved in taking a long strand of DNA from a completed molecule to the generation of all the known traits of all living things is core to an understanding of Biology and Genetics. In this task you will demonstrate your understanding of the process of Polypeptide synthesis and evaluate the success of the model in achieving its desired result.

Nature of the task: Research and Report

Inquiry question 'Why is polypeptide synthesis important?'

Part A: Submit Model by emailing it to your teacher by 9am the 13th of December 2019.

Mrs Ragunathan- Amelia.ragunathan@det.nsw.edu.au

Mrs Payne- Carley.jameson@det.nsw.edu.au

Students create a video presentation, with voiceover, demonstrating a model of polypeptide synthesis with consideration given to:

- Use, text books and internet sites to design a template for your model.
- Watch <http://www.youtube.com/watch?v=pdi3iHyRsWY>
- Start with the Double helix DNA then manipulate your model to demonstrate each step.
- Complete your model when you have formed a polypeptide.

HINT: These steps must be in your model. They are not listed in sequential order.

Double Helix
U replaces T
Splitting
Complementary bases
Unwinding DNA
Translation ribosome reads DNA
T RNA
Strand moves into cytoplasm
Transcription evident in the nucleus
M RNA
Codon
Amino acid
Peptide
Polypeptide with bonds
Key

Part B: Written Task: Friday 13th of November

Written Exam in class. To prepare for this exam you will need to research answers to the following questions:

1. Assess the importance of mRNA and tRNA in Transcription and Translation. 5 marks
2. Explain the function and importance of polypeptide synthesis 2 marks
3. Discuss the validity and reliability of models. 3 marks

Marking criteria

Knowledge and understanding

BIO12-12 explains the structures of DNA and analyses the mechanisms of inheritance and how processes of reproduction ensure continuity of species BIO12-12

Students:

- Demonstrate transcription and translation
- Assessing the importance of mRNA and tRNA
- Analysing the function and importance of polypeptide synthesis

Conducting investigations

BIO11/12-3 conducts investigations to collect valid and reliable primary and secondary data and information

Students:

- select and extract information from a wide range of reliable secondary sources and acknowledge them using an accepted referencing style

Analysing data and information

BIO11/12-5 analyses and evaluates primary and secondary data and information

Students:

- derive trends, patterns and relationships in data and information

Problem solving

BIO11/12-6 solves scientific problems using primary and secondary data, critical thinking skills and scientific processes

Students:

- use scientific evidence and critical thinking skills to solve problems

Communicating

BIO11/12-7 communicates scientific understanding using suitable language and terminology for a specific audience or purpose

Students:

- select and apply appropriate scientific notations, nomenclature and scientific language to communicate in a variety of contexts
- construct evidence-based arguments and engage in peer feedback to evaluate an argument or conclusion

Feedback provided:

To inform future learning your feedback will consist of:

- an annotated marking criteria sheet
- annotations on a pdf of your submitted work

Part C: Written Task: Friday 13th November

The following questions are to be answered and submitted to your teacher in your lesson on Friday the 13th of November:

1. List and explain 3 ways that mitosis helps with the continuity of a species. (6 marks)
2. Mitosis ensures the precise and equal distribution of chromosomes to each daughter cell. It is important that each daughter cell is an exact copy of the parent cell so that each generation of cells contains the same genetic instructions. If this does not happen it can affect the functioning and in some cases the survival of the individual. Explain some of the consequences (at least 2) if the genetic code is not exactly copied. In your answer outline the steps that would involve this consequence to happen starting with the DNA molecule. (8 marks)
3. The DNA in prokaryotes is chemically the same as the DNA in eukaryotes, but there are some differences in how it is structurally arranged in chromosomes, packaged in cells and its location inside these cells are different. There are slight differences in the processes of DNA replication and transcription. Construct a table to compare these differences in the two types of cells. (12 marks)

	Prokaryotes	Eukaryotes
Chemical composition of DNA		
Structure of Chromosome(s)		
Location of Chromosome(s)		
Packaging of DNA		
DNA replication		
Transcription process in polypeptide synthesis.		

4. The structure of proteins can be described at four levels: primary, secondary, tertiary and quaternary. Give a brief description of the structure of a protein at each of these levels. Labeled diagrams can be used, note the labels should be your own and not just copied and pasted if this is how you are to present your answer. (8 marks)
5. Proteins can be classified according to their function. Two of these categories are structural proteins and enzymes. Explain the function of each of the above groups of proteins and give an example for each group. (6 marks)

Marking Guidelines Part A

Students:	Achievement
<ul style="list-style-type: none"> ▪ Model presented –all stages of protein synthesis modelled in detail. All stages clearly flowing as part of a sequence of events. ▪ Correct use of scientific terms in the effective modelling of protein synthesis (7 +terms) <ul style="list-style-type: none"> • All Labelling complete and correct. • use appropriate, clear and relevant biological terminology • Correct referencing 	36-45
<ul style="list-style-type: none"> ▪ Model presented –all stages of protein synthesis modelled in correct sequence ▪ Correct use of scientific terms in the effective modelling of protein synthesis (5-6+terms) <ul style="list-style-type: none"> • Labelling mostly complete and correct. • Use mostly appropriate, clear and relevant biological terminology • Mostly Correct referencing 	27-35
<ul style="list-style-type: none"> ▪ Model presented –stages of protein synthesis modelled. Some stages not in the correct sequence ▪ Correct use of scientific terms in the effective modelling of protein synthesis (4+terms) <ul style="list-style-type: none"> • Some Labelling complete and correct. • Use some appropriate, clear and relevant biological terminology • Some Correct referencing 	15-26
<p>Model presented – some stages of protein synthesis evident</p> <ul style="list-style-type: none"> ▪ Correct use of scientific terms in the effective modelling of protein synthesis (2-3+terms) <ul style="list-style-type: none"> • Limited Labelling that is complete and correct. • Limited use of appropriate, clear and relevant biological terminology • Limited referencing 	8-14
<ul style="list-style-type: none"> ▪ Model attempted ▪ Labelling incorrect. ▪ In correct referencing 	0-7