JOHN EDMONDSON HIGH SCHOOL
Assessment Notification

Faculty: Science  Course: Biology  Year: 12
Assessment Task: Model Construction and Analysis Report
Assessment Weighting: 20%  Due: Term 4  Week 8  Date: 2/12/2019
Task Type: Hand in Task ☒  In Class Task ☐  Practical Task ☐

Outcomes assessed (NESA)
BIO11/12-2 Designs and evaluates investigations in order to obtain primary and secondary data and information.

BIO11/12-3 Conducts investigations to collect valid and reliable 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.

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

Task Description/Overview
Due before roll call in D04
DNA and Polypeptide Synthesis
Inquiry question: Why is polypeptide synthesis important?
Students:
● construct appropriate representations to model and compare the forms in which DNA exists in eukaryotes and prokaryotes (ACSBL076)
● model the process of polypeptide synthesis, including: (ACSBL079)
  – transcription and translation
  – assessing the importance of mRNA and tRNA in transcription and translation (ACSBL079)
  – analysing the function and importance of polypeptide synthesis (ACSBL080)
  – assessing how genes and environment affect phenotypic expression (ACSBL081)
● investigate the structure and function of proteins in living things

The ‘Model’
Your work showing the processes involved in a hereditary biological concept must be:
a 3D model
The model should clearly show how polypeptide synthesis occurs including:
● original DNA strand – minimum 12 base pairs
- Transcription and the action of messenger RNA (mRNA) and RNA polymerase
- Translation and the role of transfer RNA (tRNA) and the role of anticodons and codons
- Where transcription and translation occur in the cell
- Ribosomal RNA (rRNA)

How amino acids are processed into polypeptides and then processed to form a protein

**Detailed Assessment Task Description**

**RESOURCES:**
Double periods in Wk 6 and Wk 7 according to your Timetable:
Four lessons (3hrs and 20 min.) will be allocated in class to you to complete the task and MUST be completed at home in your own time.
This assessment task must be done on an individual basis.
NB: ANY TASK HANDED IN AFTER THE DUE DATE WILL RECEIVE A ZERO GRADE NO EXCEPTIONS.

Good luck!
Total marks : 60
1. Model construction: 30 Marks
2. Analysis Report : 30 marks

The following task must be completed and handed in for marking.

Model Construction and Analysis Report

This task requires you to construct a physical model to demonstrate the concept of polypeptide synthesis. Your model should be accompanied by a report.

The Analysis report should include:
- A detailed explanation of the concept covered by your model (ie: what is it showing?)
- What the components of your model represent in the concept.
- Why you chose to do the model in the way that you did and why you chose to represent the components the way you did.
- What are the limitations and benefits of your model?
- How could you simplify, improve or extend your model.

The model should clearly show how polypeptide synthesis occurs including and each should be explained in your analysis report.
1. Transcription and the role of mRNA
2. Translation and the role of tRNA
3. Where transcription and translation occur in the cell
4. How polypeptides are processed to form a protein?
5. Using the Genetic code table decode the amino acid sequence correctly
   - Met-Cys-Lys-Asp-STOP
6. Analyse the importance of polypeptide synthesis?

Each report must be
- Maximum of three A4 pages in length, including diagrams.
- All diagrams should be clearly labeled.
- Have a bibliography of at least three different reliable sources for example Video, Text book and Websites
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<thead>
<tr>
<th>Grade</th>
<th>Description</th>
<th>Mark Range</th>
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</thead>
<tbody>
<tr>
<td>Outstanding (O)</td>
<td>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.</td>
<td>79.5-100</td>
</tr>
<tr>
<td>High (H)</td>
<td>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</td>
<td>69.5-79</td>
</tr>
<tr>
<td>Sound (S)</td>
<td>The student has a sound knowledge and understanding of the content and has achieved a good level of competence in the processes and skills.</td>
<td>49.5-69</td>
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<tr>
<td>Basic (B)</td>
<td>The student has a basic knowledge and understanding of the content and has achieved a basic level of competence in the processes and skills.</td>
<td>19.5-49</td>
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<tr>
<td>Limited (L)</td>
<td>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.</td>
<td>0-19</td>
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**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