

Biology - HSC COURSE

Assessment Task: Research Task

Date to be completed: Wednesday 9th June, Week 8B Term 2 2021

Worth: 30%

Outcomes to be assessed from the Syllabus:

| HSC outcomes | A student: |
|--------------|--|
| BIO 12-1 | Develops and evaluates questions and hypotheses for scientific investigation |
| BIO 12-2 | 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 – 4 | selects and processes appropriate qualitative and quantitative data and information using a range of appropriate media |
| 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 – 7 | Communicates scientific understanding using suitable language and terminology for a specific audience or purpose |

This task will require you do some research on an infectious disease in a human. You will be allowed to collate your notes and have them with you when you complete the written or online assessment.

You will need to:

- ***Research information on how ONE named human disease is transmitted. You will also need to research how the spread of this disease can be controlled, and how the immune system responds to this disease.***
- ***Develop summary notes that are no longer than 2 double-sided A4 sheets to use during the written part of the assessment. You will be given marks for submitting your summary notes. These will be submitted on the day of the in class assessment.***
- ***Create a podcast about your chosen disease from the viewpoint of a selected stakeholder, based on a given scenario. This will be submitted on the same day as your research notes and in class assessment***
- ***Use the information you have researched to answer a series of questions on the transmission and control of diseases. This will be an in the classroom assessment given on the day of task submission.***

Task Syllabus Outcome Details

Inquiry question: *How are diseases transmitted?*

- Describe a variety of infectious diseases caused by pathogens, including microorganisms and non-cellular pathogens, and collect primary and secondary-sourced data and information relating to disease transmission, including:
 - Classifying different pathogens that cause disease in plants and animals
 - Investigating the transmission of a disease during an epidemic
 - Investigate modes of transmission of infectious diseases, including direct contact, indirect contact and vector transmission
- Investigate the work of Robert Koch and Louis Pasteur, to explain the causes and transmission of infectious diseases, including:
 - Koch's postulates
- Compare the adaptations of different pathogens that facilitate their entry into and transmission between hosts

Inquiry question: *How does a plant or animal respond to infection?*

- Analyse responses to the presence of pathogens by assessing the physical and chemical changes that occur in the host animal cells and tissues

Inquiry question: *How does the human immune system respond to exposure to a pathogen?*

- Explain how the immune system responds after primary exposure to a pathogen, including innate and acquired immunity

Inquiry question: *How can the spread of infectious diseases be controlled?*

- Investigate and analyse the wide range of interrelated factors involved in limiting local, regional and global spread of a named infectious disease
- Investigate procedures that can be employed to prevent the spread of disease, including but not limited to:
 - Hygiene practices
 - Quarantine
 - Vaccination, including passive and active immunity
 - Public health campaigns
 - Use of pesticides
 - Genetic engineering
- Investigate and assess the effectiveness of pharmaceuticals as treatment strategies for the control of infectious disease
- Investigate and evaluate the environmental management and quarantine methods used to control an epidemic or pandemic
- Interpret data relating to the incidence and prevalence of infectious disease in populations, for example:
 - Mobility of individuals and the portion that are immune or immunised

To help you with your research and notes:

The following information may help you collate your summary notes. Use the heading provided as a guide to your note taking.

How are diseases transmitted?

- Identify a disease that affects humans
- Identify the pathogen that causes this disease
- Explain how this disease is transmitted
- Describe the features of the pathogen that causes this disease that allow it to affect humans (what are its adaptations?)

How does a plant or animal respond to infection?

- Explain the chemical and physical changes that occur in the human body when it is infected with this disease

How does the human immune system respond to exposure to a pathogen?

- Explain the human immune response to this disease

How can the spread of infectious diseases be controlled?

- Describe the factors that can affect the local and regional transmission of this disease
- Identify two strategies that could be employed to prevent the spread of the disease. Evaluate the effectiveness of these strategies
- Investigate a pharmaceutical treatment strategy for the disease
- Outline one environmental management strategy and one quarantine measure that could prevent the spread of this disease across a region. Justify the use of these strategies.
- Collect and analyse data on the prevalence and incidence of this disease. Explain how this information may affect the measures used to prevent and control an outbreak of the disease.