

Syllabus checklist

MODULE 5

Heredit

BIO12–12

How does reproduction ensure the continuity of a species?

- ☐ explain the mechanisms of reproduction that ensure the continuity of a species, by analysing sexual and asexual methods of reproduction in a variety of organisms, including but not limited to:...
- ☐ analyse the features of fertilisation, implantation and hormonal control of pregnancy and birth in mammals (ACSBLO75)
- ☐ evaluate the impact of scientific knowledge on the manipulation of plant and animal reproduction in agriculture (ACSBLO74)

How important is it for genetic material to be replicated exactly?

- ☐ model the processes involved in cell replication, including but not limited to:...
- ☐ assess the effect of the cell replication processes on the continuity of species (ACSBLO84)

Why is polypeptide synthesis important?

- ☐ construct appropriate representations to model and compare the forms in which DNA exists in eukaryotes and prokaryotes (ACSBLO76)
- ☐ model the process of polypeptide synthesis, including: (ACSBLO79)
- ☐ investigate the structure and function of proteins in living things

How can the genetic similarities and differences within and between species be compared?

- ☐ conduct practical investigations to predict variations in the genotype of offspring by modelling meiosis, including the crossing over of homologous chromosomes, fertilisation and mutations (ACSBLO84)
- ☐ model the formation of new combinations of genotypes produced during meiosis, including but not limited to:...

Can population genetic patterns be predicted with any accuracy?

- ☐ investigate the use of technologies to determine inheritance patterns in a population using, for example: (ACSBLO64, ACSBLO85)
- ☐ investigate the use of data analysis from a large-scale collaborative project to identify trends, patterns and relationships, for example: (ACSBLO64, ACSBLO73)

MODULE 6

Genetic Change

BIO12–13

How does mutation introduce new alleles into a population?

- ☐ explain how a range of mutagens operate, including but not limited to:...
- ☐ compare the causes, processes and effects of different types of mutation, including but not limited to:...
- ☐ assess the significance of 'coding' and 'non-coding' DNA segments in the process of mutation (ACSBLO78)
- ☐ investigate the causes of genetic variation relating to the processes of fertilisation, meiosis and mutation (ACSBLO78)
- ☐ evaluate the effect of mutation, gene flow and genetic drift on the gene pool of populations (ACSBLO91, ACSBLO92)

How do genetic techniques affect Earth's biodiversity?

- ☐ investigate the uses and applications of biotechnology (past, present and future), including: (ACSBLO87)

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

- ☐ 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:...
- ☐ investigate and assess the effectiveness of cloning, including but not limited to:...
- ☐ describe techniques and applications used in recombinant DNA technology, for example:...
- ☐ evaluate the benefits of using genetic technologies in agricultural, medical and industrial applications (ACSBLO86)
- ☐ 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

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MODULE 7 Infectious Disease

BIO12–14

How are diseases transmitted?

- ☐ describe a variety of infectious diseases caused by pathogens, including microorganisms, macroorganisms and non-cellular pathogens, and collect primary and secondary-sourced data and information relating to disease transmission, including: (ACSBLO97, ACSBLO98, ACSBL116, ACSBL117)
- ☐ design and conduct a practical investigation relating to the microbial testing of water or food samples
- ☐ 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:...
- ☐ assess the causes and effects of diseases on agricultural production, including but not limited to:...
- ☐ compare the adaptations of different pathogens that facilitate their entry into and transmission between hosts (ACSBL118)

How does a plant or animal respond to infection?

- ☐ investigate the response of a named Australian plant to a named pathogen through practical and/or secondary-sourced investigation, for example:...
- ☐ analyse responses to the presence of pathogens by assessing the physical and chemical changes that occur in the host animals cells and tissues (ACSBL119, ACSBL120, ACSBL121, ACSBL122)

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

- ☐ investigate and model the innate and adaptive immune systems in the human body (ACSBL119)
- ☐ explain how the immune system responds after primary exposure to a pathogen, including innate and acquired immunity

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: (ACSBL124)
- ☐ investigate and assess the effectiveness of pharmaceuticals as treatment strategies for the control of infectious disease, for example:...
- ☐ investigate and evaluate 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:...
- ☐ evaluate historical, culturally diverse and current strategies to predict and control the spread of disease (ACSBL125)
- ☐ investigate the contemporary application of Aboriginal protocols in the development of particular medicines and biological materials in Australia and how recognition and protection of Indigenous cultural and intellectual property is important, for example:...

MODULE 8

Non-infectious Disease and Disorders

BIO12–15

How is an organism's internal environment maintained in response to a changing external environment?

- ☐ construct and interpret negative feedback loops that show homeostasis by using a range of sources, including but not limited to: (ACSBL101, ACSBL110, ACSBL111)
- ☐ investigate the various mechanisms used by organisms to maintain their internal environment within tolerance limits, including:...

Do non-infectious diseases cause more deaths than infectious diseases?

- ☐ investigate the causes and effects of non-infectious diseases in humans, including but not limited to:...

Why are epidemiological studies used?

- ☐ analyse patterns of non-infectious diseases in populations, including their incidence and prevalence, including but not limited to:...
- ☐ investigate the treatment/management, and possible future directions for further research, of a non-infectious disease using an example from one of the non-infectious diseases categories listed above
- ☐ evaluate the method used in an example of an epidemiological study
- ☐ evaluate, using examples, the benefits of engaging in an epidemiological study

How can non-infectious diseases be prevented?

- ☐ use secondary sources to evaluate the effectiveness of current disease-prevention methods and develop strategies for the prevention of a non-infectious disease, including but not limited to:...

How can technologies be used to assist people who experience disorders?

- ☐ explain a range of causes of disorders by investigating the structures and functions of the relevant organs, for example:...
- ☐ investigate technologies that are used to assist with the effects of a disorder, including but not limited to: (ACSBL100)
- ☐ evaluate the effectiveness of a technology that is used to manage and assist with the effects of a disorder (ACSBL100)