**YEAR 11 BIOLOGY TERM 1 and 2 OVERVIEW 2020 – HOME STUDY**

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| **TERM 1 STRAND** | **Week** | **Sub-strand** | **Resources** | **Learning Activities** |
| 1. **CELLULAR BIOLOGY** | **9 – 10**  **30th March – 10th April** | **11BIO1.3 ENZYMES**   1. Definitions:  * catalyst (Skill Level 1) * enzyme (Skill Level 1) * substrate (Skill Level 1)  1. State where enzymes are found. (Skill Level 1) 2. Describe the biological function of enzymes (Skill Level 2) 3. Describe the role of enzymes (Skill Level 2) 4. Explain the induced-fit model (Skill Level 3) 5. Describe the dual specificity of enzymes: substrate specificity and specificity of action using the induced fit model. (Skill Level 2) 6. Explain that enzymes are effective biological catalyst (Skill Level 3) 7. Explain how a certain factor can affect the functioning of a named enzyme (Skill Level 3) 8. Analyse the environmental factors that impact on enzyme activity (pH, temperature, surface area, and concentration on rates of enzyme-controlled rates relating to optimum conditions, enzyme specificity and denaturing) – (Skill Level 3) 9. Discuss the graphs and diagrams of how activity of enzyme is affected by environmental factors (Skill Level 4) | ESA Study Guide Level 2 Biology by Anna Roberts, 2011:  Chapter 7: Cell processes – enzyme activity pg. 63-68  Videos | Lesson Activity 1.3 |
| **2. GENETICS** | **11 – 13**  **13th April – 1st May** | **11BIO2.1 MOLECULAR GENETICS**   1. Define molecular genetics (Skill Level 1) 2. Define nucleus (Skill Level 1) 3. Identify the main components of the nucleus (Skill Level 1) 4. Define chromosomes (Skill Level 1) 5. Define DNA (Skill Level 1) 6. Define RNA (Skill Level 1) 7. Define genes (Skill Level 1) 8. Define alleles (Skill Level 1) 9. Define proteins (Skill Level 1) 10. Identify the main components of chromosomes (Skill Level 1) 11. Describe the structure of a chromosome (Skill Level 2) 12. Explain the relationship between chromosomes, DNA, RNA, genes, alleles and proteins (Skill Level 3) 13. Describe the structure of DNA and RNA in terms of: sugar, phosphate, nucleotide strands, bases and base pairing (Skill Level 2) 14. Define amino acids (Skill Level 1) 15. Recognise amino acids are determined by a specific DNA base sequence (Skill Level 2) 16. Define transcription (Skill Level 1) 17. Define translation (Skill Level 1) 18. Describe the sequence of events that involve DNA, mRNA, tRNA in the production of proteins (Skill Level 2) 19. Explain the relationship between a gene, protein synthesis and polypeptide chain (protein/enzymes) – (Skill Level 3) 20. Outline the processes of transcription and translation (Skill Level 2) 21. Differentiate between the two processes of protein synthesis (Skill Level 3) | ESA Study Guide Level 2 Biology by Anna Roberts, 2011:  Chapter 3: Cell structure and function pg. 25  Chapter 6: Cell processes – DNA structure and replication: cell division pg. 55-62  Chapter 12: Proteins and protein synthesis pg. 115-123  Videos | Lesson Activity 2.1 |
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| **TERM 2 STRAND** | **Week** | **Sub-strand** | **Resources** | **Learning Activities** |
| 1. **GENETICS** | **1 – 2**  **18th – 29th May** | **11BIO2.2 CELL GROWTH AND DIVISION**   1. Describe the process of DNA replication (Skill Level 2) 2. Explain the importance of the DNA replication (Skill Level 3) 3. Name/Identify the two types of cell divisions (Skill Level 1) 4. Explain the different phases of the cell division Meiosis (Skill Level 2) 5. Explain the different phases of the cell division Mitosis (Skill Level 2) 6. Differentiate between the two cell divisions: mitosis and meiosis (Skill Level 3) 7. Relate mitosis and meiosis to the daughter cells produced: chromosome number, number of daughter cells, variation and function (Skill Level 3) 8. Explain how crossing over, recombination and independent assortment produces variation in daughter cells (Skill Level 3) 9. Discuss the role of mitosis and meiosis in the life cycle of an organism (Skill Level 4) | ESA Study Guide Level 2 Biology by Anna Roberts, 2011:  Chapter 6: Cell processes – DNA structure and replication: cell division pg. 55-62;  Videos | Lesson Activity 2.2 |
| 1. **ORGANISM LEVEL BIOLOGY** | **3 – 4**  **1st – 12th June** | **11BIO3.1 Reproduction in Plants**   1. Define sexual reproduction in plants (Skill Level 1) 2. Define asexual reproduction in plants (Skill Level 1) 3. Describe asexual reproduction in plants (Skill Level 2) 4. Describe sexual reproduction in plants (Skill Level 2) 5. Discuss the advantages and disadvantages of sexual reproduction in plants (Skill Level 4) 6. Discuss the advantages and disadvantages of asexual reproduction in plants (Skill Level 4) 7. Explain the role of fertilization of seeds, and spore dispersal on the life cycle of mosses (Skill Level 3) 8. Explain the role of fertilization of seeds, and spore dispersal on the life cycle of ferns (Skill Level 3) 9. Explain the role of fertilization of seeds, and spore dispersal on the life cycle of gymnosperms (Skill Level 3) 10. Explain the role of fertilization of seeds, and spore dispersal on the life cycle of angiosperms (Skill Level 3) 11. Describe the role of mitosis in plant reproduction (Skill Level 2) 12. Describe the role of meiosis in plant reproduction (Skill Level 2) 13. Describe the alternation of generation in the plant life cycle (Skill Level 2) 14. Define sporophyte (Skill Level 1) 15. Define gametophyte (Skill Level 1) 16. Define gymnosperms (Skill Level 1) 17. Define angiosperm (Skill Level 1) 18. Compare sporophyte and gametophyte generations in mosses (Skill Level 3) 19. Compare sporophyte and gametophyte generations in ferns (Skill Level 3) 20. Compare sporophyte and gametophyte generations in gymnosperms (Skill Level 3) 21. Compare sporophyte and gametophyte generations in angiosperm (Skill Level 3) | ESA Study Guide Level 2 Biology by Anna Roberts, 2011:  Chapter 27: Reproduction in plants pg. 261-278  Videos | Lesson Activity 3.1 |
|  | **5 – 6**  **15th – 26th June** | **11BIO3.2 HUMAN NUTRITION**   1. Identify/Name the types of food in a modern diet (Skill Level 1) 2. Identify/Name the types of food in a traditional Pacific diet (Skill Level 1) 3. List the advantages and disadvantages of a traditional Pacific diet (Skill Level 2) 4. List the disadvantages of a modern diet (Skill Level 2) 5. Compare the advantages and disadvantages of the traditional Pacific diet and modern diet (Skill Level 3) 6. Identify diseases caused by a change in diet (Skill Level 1) 7. Identify the features of a healthy digestive system (Skill Level 1) 8. Define gastric ulcers (Skill Level 1) 9. Define gall stones (Skill Level 1) 10. Compare a healthy digestive system to one that is affected by a low fibre diet, gastric ulcers and gall stones (Skill Level 3) 11. Explain the function of the liver (Skill Level 3) 12. Discuss the effects of high blood sugar (diabetes) to the normal functioning of the liver (Skill Level 3) 13. Compare high blood pressure to normal blood sugar (Skill Level 3) 14. Recommend ways to minimize the risk of diabetes (Skill Level 4) 15. List the different non communicable diseases that are caused by change from the traditional Pacific diet to a modern diet (Skill Level 2) 16. Describe some examples of non-communicable diseases (Skill Level 2) 17. Explain how non-communicable diseases affect the digestive system (Skill Level 3) | Internet  Videos | Lesson Activity 3.2 |
|  | **7 – 8**  **29th June – 10th July** | **11BIO3.3 ANIMAL DIGESTION**   1. Define ingestion (Skill Level 1) 2. Define digestion (Skill Level 1) 3. Define absorption (Skill Level 1) 4. Define egestion (Skill Level 1) 5. Describe the processes of ingestion (Skill Level 2) 6. Describe the processes of digestion (Skill Level 2) 7. Describe the processes of absorption (Skill Level 2) 8. Describe the processes of egestion (Skill Level 2) 9. List the digestive organs in a human being (Skill Level 1) 10. Describe the functions of each of the digestive organs in humans (Skill Level 3) 11. Explain the importance of these processes for the survival of animals (Skill Level 3) 12. List the main digestive enzymes in carnivores (Skill Level 2) 13. List the main digestive enzymes in herbivores (Skill Level 2) 14. List the main digestive enzymes in omnivores (Skill Level 2) 15. Distinguish between the different types of digestive systems of a carnivore, herbivore and omnivore (Skill Level 3) 16. Differentiate between the digestive systems of the sea anemone, earthworm and humans (Skill Level 3) | ESA Study Guide Level 2 Biology by Anna Roberts, 2011:  Chapter 19: Nutrition in animals pg. 187-195; Chapter  Internet  Videos | Lesson Activity 3.3 |
| **3. ORGANISM LEVEL BIOLOGY** | **9 – 11**  **13th – 31st July** | **11BIO3.4 ANIMAL GAS EXCHANGE**   1. Define ventilation (Skill Level 1) 2. Define gas exchange (Skill Level 1) 3. Define cellular respiration (Skill Level 1) 4. List the gas exchange organs in a human being (Skill Level 2) 5. Describe the functions of each of the gas exchange organs in humans (Skill Level 2) 6. Identify the body parts of different animals associated with gas exchange (Skill Level 1) 7. Explain how the gas exchange systems depend on way of life including size and mobility: body surface (e.g. earthworm), gills (e.g. fish, crab), trachea (e.g. human) – (Skill Level 3) 8. Discuss the importance of the gas exchange process to the life of an organism (Skill Level 3) 9. Compare the processes of breathing (ventilation, gas exchange and cellular respiration (Skill Level 3) 10. Explain how gas is exchanged over the surface area (Skill Level 3) 11. Explain how gas is exchanged over the trachea (Skill Level 3) 12. Explain how gas is exchanged over the lung (Skill Level 3) 13. Explain how gas is exchanged over the gills, surface area, trachea and lung (Skill Level 3) | ESA Study Guide Level 2 Biology by Anna Roberts, 2011:  Chapter 21: Gas Exchange in Animals pg. 211-218;  Internet  Videos | Lesson Activity 3.4 |
| 1. **ENVIRONMENTAL BIOLOGY** | **12 – 13**  **3rd – 14th August** | **11BIO4.1 Ecosystems**   1. Define population (Skill Level 1) 2. Define community (Skill Level 1) 3. Define biodiversity (Skill Level 1) 4. Define ecosystem (Skill Level 1) 5. Distinguish between population, community and ecosystem (Skill Level 3) 6. Describe the features of an ecosystem (Skill Level 2) 7. List some of the factors affecting the ecosystem (Skill Level 2) 8. Define biotic (Skill Level 1) 9. Define abiotic (Skill Level 1) 10. Define food chains (Skill Level 1) 11. Define food webs (Skill Level 1) 12. Describe the effects of some of the abiotic factors (Skill Level 2) 13. Describe the effects of some of the biotic factors (Skill Level 2) 14. Explain the significance of food chains (Skill Level 3) 15. Explain the significance of food webs (Skill Level 3) 16. Explain how energy flows through different trophic levels in a community (Skill Level 3) 17. Discuss human impacts on specific local ecosystems using specific examples (Skill Level 4) 18. Explain the relationship between biodiversity and ecosystem survival (Skill Level 3) 19. Evaluate the loss of biodiversity and its effects on the ecosystem survival (Skill Level 4) 20. Identify an environmental issue that affects an ecosystem (Skill Level 1) 21. Discuss the implications of an environmental issue that affects a particular ecosystem (Skill Level 4) | ESA Study Guide Level 2 Biology by Anna Roberts, 2011:  Chapter 14: Ecological niche pg. 137-141;  Chapter 15: Communities pg. 143-150  Chapter 16: Interrelationships pg. 151-156  Videos | Lesson Activity 4.1 |