



Year 12 Biology Learning Journey

When?	Knowledge	Understanding	Assessment
<p>Topic 1: Section 1 : 1 Biological Molecules</p>	<p>Will be able to</p> <ul style="list-style-type: none"> • Describe and explain the structure and function of carbohydrates, lipids, proteins and enzymes • Describe, explain and perform the chemical tests to identify reducing and non-reducing sugars, starch, lipids and proteins. • Investigate , analyse and calculate the rate of enzyme controlled reactions, explaining the factors that could affect enzyme activity 	<ul style="list-style-type: none"> • Students recognise, from diagrams, saturated and unsaturated fatty acids and explain the different properties of triglycerides and phospholipids • Students use, and interpret the results of, qualitative tests for reducing sugars, non-reducing sugars and starch. • Students use chromatography, with known standard solutions, to separate a mixture of monosaccharides and identify their components. • Students produce a dilution series of glucose solution and use colorimetric techniques to produce a calibration curve with which to identify the concentration of glucose in an unknown solution. • Students use, and interpret the results of, the emulsion test for lipids. • Students use, and interpret the results of, a biuret test for proteins. • Students use chromatography with known standard solutions, to separate a mixture of amino acids and identify their components. • Students identify the variables that must be controlled in their investigation into rate of reaction. • Students calculate the uncertainty of their measurements of the rate of reaction. MS 3.2 • Students select an appropriate format for the graphical presentation of the results of their investigation into the rate of enzyme controlled reactions. • Students use a tangent to find the initial rate of an enzyme-controlled reaction. 	<p style="text-align: center;">Assessment: Carbohydrates, (20 marks) Lipids, (20 marks) Proteins (22 marks) Enzymes assessments (37 marks)</p>

When?	Knowledge	Understanding	Assessment
<p style="text-align: center;">Topic 2 : Section 1 : 2 Nucleic Acids</p>	<p>Will be able to</p> <ul style="list-style-type: none"> • Describe and compare the structures of DNA and RNA. • Describe semi-conservative replication of DNA and explain the experimental evidence. Describe the structure and function of other biologically important molecules, ATP, water and inorganic ions. 	<ul style="list-style-type: none"> • Students use incomplete information about the frequency of bases on DNA strands to find the frequency of other bases. • Students should be able to appreciate that the relative simplicity of DNA led many scientists to doubt that it carried the genetic code. • Students should be able to evaluate the work of scientists in validating the Watson–Crick model of DNA replication. • Students should be able to recognise the role of ions in the following topics: hydrogen ions and pH; iron ions as a component of haemoglobin; sodium ions in the co-transport of glucose and amino acids; and phosphate ions as components of DNA and of ATP. 	<p style="text-align: center;">Assessment: DNA and DNA replication assessment (30 marks)</p>

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<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Topic 3: Section 2 : 5 Cell Recognition and the Immune System</p>	<p>Will be able to</p> <ul style="list-style-type: none"> • Describe the specific and non-specific immune response • Explain different types of immunity and the use of vaccination • Explain the importance of antigenic variation • Describe the structure and function of antibodies and their use in medicine • Describe the structure and replication of HIV <p>Describe the symptoms of AIDS and the control HIV infection</p>	<ul style="list-style-type: none"> • Students should be able to discuss ethical issues associated with the use of vaccines and monoclonal antibodies • Students should be able to evaluate methodology, evidence and data relating to the use of vaccines and monoclonal antibodies. 	<p style="text-align: center;">Assessment: Immune system assessment (40 marks)</p>

When?	Knowledge	Understanding	Assessment
<p>Topic 4 : Section 4 : 8 DNA, Genes and Protein Synthesis</p>	<p>Will be able to</p> <ul style="list-style-type: none"> • Compare how DNA is stored in prokaryotes and eukaryotes • Describe protein synthesis including the roles of the different types of RNA • Explain the genetic code and interpret experimental data on nucleic acids 	<ul style="list-style-type: none"> • Students should be able to relate the base sequence of nucleic acids to the amino acid sequence of polypeptides, when provided with suitable data about the genetic code • Students should be able to interpret data from experimental work investigating the role of nucleic acids. 	<p>Assessment: Protein synthesis assessment (41 marks)</p>