



Year 12 Biology Curriculum Summary



YEAR GROUP: 12 AC

SUBJECT: Biology

When?

Knowledge

Understanding

Assessment



When?	Knowledge	Understanding	Assessment
Biological Molecules	<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	<p>Assessment: Carbohydrates, Lipids, Proteins Enzymes</p>



When?	Knowledge	Understanding	Assessment
Nucleic Acids	<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. <p>Describe the structure and function of other biologically important molecules, ATP, water and inorganic ions.</p>	<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>Assessment: DNA and DNA replication</p>



When?	Knowledge	Understanding	Assessment
Section 2 : 5 Cell Recognition and the Immune System	<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>Immune system</p>



When?	Knowledge	Understanding	Assessment
DNA, Genes and Protein Synthesis	<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>Protein synthesis</p>

