

## MAGHULL HIGH SCHOOL – CURRICULUM MAP

Unit: <b>Biological Molecules</b>	1. Monomers & Polymers 2. Carbohydrates 3. Lipids	4. Proteins 5. Many proteins are enzymes 6. Structure of DNA and RNA	7. DNA replication 8. ATP 9. Water 10. Inorganic ions
<b>LESSONS</b>			
<b>Knowledge &amp; Skills Development</b>	<ul style="list-style-type: none"> <li>Define monomers, polymers, monosaccharides, condensation reaction and hydrolysis</li> <li>Describe how monosaccharides are formed by two condensation reaction of two monosaccharides.</li> <li>Polysaccharides are formed by the condensation of many glucose units.</li> <li>Recall the biochemical test using Benedict's solution for reducing sugars and non-reducing sugars and iodine/potassium iodide for starch.</li> <li>Describe how triglycerides are formed by the condensation of one molecule of glycerol and three molecules of fatty acid.</li> <li>recognise, from diagrams, saturated and unsaturated fatty acids</li> <li>explain the different properties of triglycerides and phospholipids.</li> <li>Define and draw the structure of amino acids</li> <li>Recall how dipeptides and polypeptides are formed</li> <li>Recall and carry out the biuret test for proteins</li> <li>Explain the role of hydrogen bonds, ionic bonds and disulphide bonds in the structure of proteins</li> </ul>	<ul style="list-style-type: none"> <li>appreciate how models of enzyme action have changed over time</li> <li>appreciate that enzymes catalyse a wide range of intracellular and extracellular reactions that determine structures and functions from cellular to whole-organism level.</li> <li>Describe the effects of the following factors on the rate of enzyme-controlled reactions – enzyme concentration, substrate concentration, concentration of competitive and of non-competitive inhibitors, pH and temperature.</li> <li>Describe and label the structure on DNA and RNA. Compare them.</li> <li>appreciate that the relative simplicity of DNA led many scientists to doubt that it carried the genetic code.</li> <li>Recall the process of semi-conservative replication of DNA</li> <li>evaluate the work of scientists in validating the Watson–Crick model of DNA replication.</li> <li>Describe and label the structure of ATP</li> <li>Describe and explain how ATP is resynthesised</li> <li>Recall the several properties of water that make it so important in Biology</li> <li>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</li> </ul>	
<b>Assessment / Feedback Opportunities</b>	<b>Formative Assessment</b> Teacher questioning Quizzes Exam style questions Essays	<b>Summative assessment</b> Topic assessment Exam questions in future end of topic assessments to assess recall	

<b>Key Vocabulary</b>	<p>Independent Variable, Dependent Variable, Control Variables, Method, Conclusion, Precaution, Evaluation, Reliable, Precision, Valid, Anomaly, Describe, Explain, Compare, Analyse, Calculate, Suggest, Absolute, Uncertainty, Error</p> <p>Covalent, Ionic, Hydrogen, Monomer, Polymer, Polymerisation, Condensation, Hydrolysis, Monosaccharide, Disaccharide, Triglyceride, Phospholipid, Hydrophilic, Hydrophobic, Double helix</p>
<b>Literacy/Reading Opportunities</b>	<p>Subject specific vocabulary introduced before reading of related texts</p> <p>Word etymology from Latin and Greek roots</p> <p>Reading of simple and complex sentences, paragraphs, articles</p> <p>Scientific writing including structuring methods, comparisons and evaluations</p> <p>Synoptic essay writing</p>
<b>Cross Curricular Themes</b>	<p>Numeracy/Maths – averages (means), reading scales, graph plotting, lines of best fit, using and rearranging equations, using scientific calculators, significant figures</p>
<b>Personal Development (Including British Values, RSE, Citizenship)</b>	<p>None</p>
<b>Career Opportunities</b>	<p>Forensics, anthropology, archaeology, biological scientists, microbiology, biochemistry</p>