




# YEAR 12 TERM 1

'An ambitious curriculum that meets the needs of all'

## Medium Term Planning - Topic: Core concepts: enzymes and biological reactions

Curriculum Intent	
Skills/National Curriculum Links	<p>Developing knowledge from GCSE Biology or GCSE Combined Science, pupils will be taught, following National Curriculum guidelines, the following this topic:</p> <ul style="list-style-type: none"> <li>The protein nature of enzymes</li> <li>Sites of enzyme action</li> <li>Enzymes and activation energy</li> <li>The course of an enzyme-controlled reaction</li> <li>Factors affecting enzyme action</li> <li>Enzyme inhibition</li> <li>Immobilised enzymes</li> </ul> <p>Specified practical work:</p> <ul style="list-style-type: none"> <li>Investigation into the effect of temperature or pH on enzyme activity</li> <li>Investigation into the effect of substrate concentration on enzyme activity</li> </ul>
Spiritual, moral, social, and cultural development	<p><b>SMSC:</b> Food intolerances and how enzymes are used industrially to support specific dietary needs</p> <p><b>PSHE/British Values:</b> n/a</p> <p><b>Skills Builder:</b> Practical skills, reading a scientific method, recording results</p>
Numeracy	<p>Calculation of average rate and rate of reaction at a specific point using a tangent to a curve</p> <p>Appreciation of units for concentration</p>
Literacy	<p><b>Vocabulary Tier 2:</b> enzyme, substrate, product, immobilised, rate, inhibitor, competitive, non-competitive, saturated</p> <p><b>Vocabulary Tier 3:</b> active site, allosteric site, activation energy, biosensor, enzyme-substrate complex, limiting factor,</p> <p><b>Reading:</b> Students are given opportunity to develop their skills in specified tasks that develop disciplinary literacy. Throughout the A Level Biology course they develop their understanding of the requirements of exam questions and the key terminology in questions. In addition, they read practical methodology and translate this to actions in laboratory tasks.</p> <p><b>Writing:</b> Students construct answers independently and through class teaching. Their answers range from single word answers to the planning and writing of 9-mark "extended writing" tasks that require linking of multiple concepts from a topic or across topics. These often develop students' ability to construct written evaluations of contrasting situations, or data, where the use of comparative connectives are required.</p> <p><b>Oracy:</b> Students are regularly given the opportunity to practice their scientific vocabulary in class discussion, through choral response, pair or group discussion and in giving instruction to others during practical activities.</p>
Becoming future ready	<p><b>Careers/Employability:</b> A Level Biology students from Crompton House progress on to a wide range of undergraduate degrees, degree apprenticeships and into work. Opportunities to develop effective communication skills, concise written work, following written and verbal instructions as well as extending their problem solving skills are all key skills identified by business leaders for future success.</p>
Adaptation	<p>Throughout this topic, quality first teaching will provide adaptive teaching accessible to all students:</p> <p><b>By product:</b> Assessments have opportunities for students to achieve all grades, with structured questions and opportunities for development of extended writing for all abilities.</p> <p><b>By Intervention:</b> by providing different levels of supervision and support in theory and in practical lessons.</p> <p><b>By Progressive Questioning:</b> exploring pupils' understanding through interactive dialogue.</p> <p><b>By Grouping:</b> according to prior attainment, gender, social preference.</p> <p><b>By Task:</b> Pupils are involved in the identification of targets which are meaningful to them and in the selection of an appropriate task to develop specific skills further.</p> <p><b>By Offering Optional Activities:</b> In class or as homework, to extend learning.</p> <p>This QFT/SEND provision will be explicit within the lesson-by-lesson schemes of work.</p>
QFT/SEND Provision	
Implementation	<p>To be able to:</p> <ul style="list-style-type: none"> <li>Understand that metabolism is a series of enzyme-controlled reactions</li> </ul>

<b>Curriculum Delivery</b>	<ul style="list-style-type: none"> <li>Describe the <b>structure of enzymes</b> and their sites of action</li> <li>Distinguish sites of enzyme action</li> <li>Describe how the properties of enzymes are related to their structures</li> <li>Explain the mechanisms of action of enzyme molecules with reference to specificity Active site and enzyme-substrate complex</li> <li>Explain how enzymes are affected by temperature, pH and the concentration of reactants</li> <li>Explain the effects and mechanisms of competitive and non-competitive inhibition</li> <li>Explain the principle of immobilised enzymes and their advantages over 'free' enzymes</li> <li>Describe some industrial and medical uses of immobilised enzymes</li> </ul>	
<b>Learning Outcomes (Knowledge)</b>	Red denotes interleaving; aspects of knowledge covered previously.	
<b>Current learning to be developed in the future within:</b>	Core concept topics are developed further in all three final exam Components.	
<b>Assessment</b>	Refer to assessment maps for formative and summative assessment opportunities.	
<b>Impact</b>	Attainment and Progress – Refer to assessment results / data review documentation.	