

# NHSG Key Stage 3 Unit Overview for 1.2 Enzymes



Scheme of Learning	ENZYMES	
Learning outcomes	Subject content:	Skill set:
	<ul style="list-style-type: none"> <li>Describe experiments that can be used to investigate enzymatic reactions.</li> <li>Explain the mechanism of enzyme action</li> <li>How limiting factors affect enzyme-controlled reactions.</li> </ul>	<ul style="list-style-type: none"> <li>Practical to investigate the effect of substrate concentration on the rate of reaction.</li> <li>Practical to investigate the effect of temperature on an enzyme-controlled reaction.</li> </ul>
Key Question –	How enzymes control and carry out biological reactions.	
Knowledge	Key concepts and skills	Key terminology
	<ul style="list-style-type: none"> <li>Using practical investigations to investigate the factors that affect enzyme activity including temperature and substrate and enzyme concentrations.</li> <li>Understand the lock and key mechanisms to explain how enzymes function.</li> <li>Look at what factors slow down or speed up the rate of reactions.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Enzyme</li> <li>➤ Substrate</li> <li>➤ Product</li> <li>➤ Active site</li> <li>➤ Enzyme-substrate complex</li> <li>➤ Enzymes product complex</li> <li>➤ Catalyse</li> <li>➤ Denature</li> <li>➤ Lock and key model</li> </ul>
Ongoing Assessment i.e. formative	Retrieval questions at the start of every lesson. These questions refer to previous knowledge of enzymes and reactions from Y7 and 8 which will help them develop further knowledge in Y9.	

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	<p>Assessment in the form of gap fill, questions and tasks in the topic book, including</p> <ul style="list-style-type: none"> <li>➤ Reading comprehension on enzyme function</li> <li>➤ 6 mark question on temperature and enzymes</li> <li>➤ Practical graph assessments</li> </ul> <p>Key misconception:</p> <ul style="list-style-type: none"> <li>➤ Enzymes are killed</li> <li>➤ Enzymes are denatured at low temperatures</li> <li>➤ Enzymes only break down molecules into smaller ones</li> <li>➤ Enzymes are living</li> <li>➤ Enzymes are only involved in the digestion of food</li> </ul> <p>Homework:</p> <ul style="list-style-type: none"> <li>➤ To complete graph from the 2 practicals we do.</li> <li>➤ Complete the table listing various enzymes and their substrates and products.</li> </ul> <p>Revision checklist: Specification used as revision checklist in front of topic booklet.</p>
<b>Key assessment</b>	<p>Practical assessment-: Graph assessment from data collected for the enzyme and substrate concentration practical.</p> <p>End of topic test combined with the topic of enzymes. Closed book 35 minutes.</p> <p>Test will assess key skills and content from specification of this unit:</p> <p>This is an in-class assessment which will be marked by teachers</p> <p>Data is analysed and a colour is given based on the spread of grades outlined in the T&amp;L policy.</p>
<b>Clear sequencing of content</b>	<p>In Y8 students have 1 lesson on a basic introduction to enzymes which includes the lock and key mechanism what an enzyme is and does limited to digestive enzymes.</p> <p>In Y9 the students build upon this knowledge to include factors that affect enzyme action and cover more concepts such as denaturing and enzymes that are not related to the digestive system. They analyse graphs to show how certain factors affect rates of reaction and calculate rates of reaction from an experiment.</p> <p>The concepts from this topic also underpin other topics in B1 such as respiration and photosynthesis.</p>
<b>Links to Careers</b>	<p>Links to the following careers are in the booklet with QR codes.</p>

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	<a href="https://www.biochemistry.org/careers-and-education/careers/career-options/">https://www.biochemistry.org/careers-and-education/careers/career-options/</a> <a href="https://nationalcareers.service.gov.uk/job-profiles/biochemist">https://nationalcareers.service.gov.uk/job-profiles/biochemist</a> <a href="https://nationalcareers.service.gov.uk/job-profiles/food-scientist">https://nationalcareers.service.gov.uk/job-profiles/food-scientist</a> <a href="https://www.bda.uk.com/resource/a-day-in-the-life-of-a-dietitian-clinical-and-industry.html">https://www.bda.uk.com/resource/a-day-in-the-life-of-a-dietitian-clinical-and-industry.html</a> <a href="https://nationalcareers.service.gov.uk/job-profiles/nutritionist">https://nationalcareers.service.gov.uk/job-profiles/nutritionist</a>
Diversity and Inclusion	Article on lactose intolerance in the booklet which includes the distribution of people with lactose intolerance around the world.
Support	<p>Every student receives handout packs including specification</p> <p>PowerPoints for each lesson are on SharePoint to help catch up with missed lessons or for students to review content.</p> <p>Biology support club- students attend if they wish but those who we think will benefit will be directed to attend through their class teacher.</p> <p>pp and LAT provided with CGP revision workbooks.</p> <p>Online revision <a href="#">GCSE Biology (Single Science) - OCR Gateway - BBC Bitesize</a></p> <p>Amoeba sisters videos</p>
Challenge	<p>Article on lactose intolerance in booklet</p> <p>Various science challenges-</p> <p>RSB Biology challenge for Y9/10</p> <p>The Homerton college Cambridge challenge</p> <p>The imperial collegeFaculty of Natural Sciences: Science and innovation competition</p> <p>BioArtAttack 3D</p> <p>BioArtAttack 2D</p> <p>2 stretch and challenge articles with questions to go alongside are provided at the back of the topic booklet.</p>