



YEAR 13 TERM 1

'An ambitious curriculum that meets the needs of all'

Medium Term Planning - Topic: Respiration releases chemical energy in biological processes

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"> Glycolysis The link reaction The Krebs cycle Electron transport chain Anaerobic respiration The energy budget Alternative respiratory pathways <p>Specified practical work:</p> <ul style="list-style-type: none"> Investigation into factors affecting the rate of respiration in yeast
Spiritual, moral, social, and cultural development	<p>SMSC: n/a</p> <p>PSHE/British Values: diet – linked to alternate respiratory substrates</p> <p>Skills Builder: Practical work, independent investigation, data handling and analysis</p>
Numeracy	<p>Rate calculations</p> <p>Efficiency of ATP production</p>
Literacy	<p>Vocabulary Tier 2: glucose</p> <p>Vocabulary Tier 3: aerobic, anaerobic, glycolysis, decarboxylation, dehydrogenation, coenzyme, NAD, FAD, triose phosphate, electron transport chain, ATP synthase, electron acceptor, acetyl coenzyme A, pyruvate, lactate, substrate level phosphorylation, oxidative phosphorylation,</p> <p>Reading: 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>Writing: 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>Oracy: 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>Careers/Employability: 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>By product: Assessments have opportunities for students to achieve all grades, with structured questions and opportunities for development of extended writing for all abilities.</p> <p>By Intervention: by providing different levels of supervision and support in theory and in practical lessons.</p> <p>By Progressive Questioning: exploring pupils' understanding through interactive dialogue.</p> <p>By Grouping: according to prior attainment, gender, social preference.</p> <p>By Task: 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>By Offering Optional Activities: 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"> Outline respiration as a series of four distinct but linked stages: glycolysis, the link

Curriculum Delivery	<p>reaction, the Krebs cycle and the electron transport chain</p> <ul style="list-style-type: none"> • Explain that glycolysis takes place in the cytoplasm and involved the breakdown of glucose to pyruvate with the production of ATP and reduced NAD • Describe the diffusion of pyruvate into the matrix of the mitochondrion and its conversion to acetyl coenzyme A by the link reaction • Describe the Krebs cycle as a series of reaction resulting in the formation of ATP and carbon dioxide, and reducing the coenzymes NAD and FAD • Explain that the Krebs cycle involves decarboxylation and dehydrogenation reactions • Explain that oxidative phosphorylation is located on the cristae of the mitochondria and involves electron carriers, proton pumps and ATP synthase in the production of ATP • Describe how anaerobic respiration involves only glycolysis, with the conversion of pyruvate to ethanol and carbon dioxide in fungi and plants under certain conditions, and to lactate in animals • Understand that anaerobic respiration yields far less energy than aerobic respiration • Describe how fats and amino acids may be used as alternative energy sources
Learning Outcomes (Knowledge)	<p>Red denotes interleaving; aspects of knowledge covered previously.</p>
Current learning to be developed in the future within:	Homeostasis & the kidney
Assessment	Refer to assessment maps for formative and summative assessment opportunities.
Impact	Attainment and Progress – Refer to assessment results / data review documentation.

