




## YEAR 13 TERM 2

'An ambitious curriculum that meets the needs of all'

### Medium Term Planning - Topic: Photosynthesis uses light energy to synthesise organic molecules

<b>Curriculum Intent</b>	<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>Chloroplasts and light trapping</li> <li>Light harvesting</li> <li>Light dependent reaction</li> <li>Light independent reaction</li> <li>Product synthesis</li> <li>Limiting factors in photosynthesis</li> <li>Mineral nutrition</li> </ul> <p>Specified practical work:</p> <ul style="list-style-type: none"> <li>Separation of chloroplast pigments by chromatography</li> <li>Investigation into factors affecting the rate of photosynthesis</li> <li>Investigation into the role of nitrogen and magnesium in plant growth</li> </ul>
<b>Spiritual, moral, social, and cultural development</b>	<p><b>SMSC:</b> n/a  <b>PSHE/British Values:</b> n/a  <b>Skills Builder:</b> Practical work, independent investigation, data handling and analysis</p>
<b>Numeracy</b>	<p>Calculation of rate  Rf calculations (ratio)</p>
<b>Literacy</b>	<p><b>Vocabulary Tier 2:</b> pigment, cyclic, non-cyclic  <b>Vocabulary Tier 3:</b> chloroplast, transducer, absorption spectrum, action spectrum, antenna complex, photophosphorylation, photolysis, photosystem, electron transport chain, limiting factor, light compensation point  <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.  <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.  <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>
<b>Becoming future ready</b>	<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>
<b>Adaptation</b>	<p>Throughout this topic, quality first teaching will provide adaptive teaching accessible to all students:  <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.  <b>By Intervention:</b> by providing different levels of supervision and support in theory and in practical lessons.  <b>By Progressive Questioning:</b> exploring pupils' understanding through interactive dialogue.  <b>By Grouping:</b> according to prior attainment, gender, social preference.  <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.  <b>By Offering Optional Activities:</b> In class or as homework, to extend learning.  This QFT/SEND provision will be explicit within the lesson-by-lesson schemes of work.</p>
<b>QFT/SEND Provision</b>	
<b>Implementation</b>	<p>To be able to:</p> <ul style="list-style-type: none"> <li>Describe the distribution of chloroplasts and their function as transducers</li> </ul>

<b>Curriculum Delivery</b>	<ul style="list-style-type: none"> <li>• Describe the absorption spectrum and the action spectrum</li> <li>• State that the light dependent stage takes place on and across the chloroplast's thylakoid membranes</li> <li>• Understand that chloroplast pigments are grouped together to form photosystems I and II, in which antenna complexes bring energy from photons of light to the two types of reaction centre</li> <li>• Explain that both cyclic and non-cyclic photophosphorylation involve chemiosmosis and ATP production</li> <li>• Describe the light dependent stage as the photoactivation of chlorophyll and energy transfer, producing ATP, reduced NADP and the by-product oxygen</li> <li>• Explain the use of reduced NADP and ATP in the light independent stage, in which carbon dioxide is fixed and reduced to glucose</li> <li>• Describe how cellular metabolites are derived from the products of photosynthesis</li> <li>• Explain how light intensity, carbon dioxide concentration and temperature may be limiting factors in photosynthesis</li> <li>• Describe the role of nitrogen and magnesium in flowering plants</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>	Respiration	
<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.	