



NHSG Key stage 3: Unit Overview for 1.4 Photosynthesis

Scheme of Learning	1.4 Photosynthesis
Learning outcomes	<p>Subject Content</p> <ul style="list-style-type: none"> Describe photosynthetic organisms as the main producers of food and therefore of Biomass for life on Earth. Describe the process of photosynthesis. Describe photosynthesis as an endothermic reaction. Describe the experiments to investigate photosynthesis. Explain the effect of temperature, light intensity and carbon dioxide concentration on the rate of photosynthesis. Explain the interaction of these factors in limiting of the rate of photosynthesis. <p>Skill set</p> <ul style="list-style-type: none"> Practical using pond weed to determine how light intensity effects the rate of photosynthesis. Plotting a graph and recording data in a table
Key questions	How does the process of photosynthesis bring energy into food chains and provide energy to all living organisms?
Knowledge	<p>Key Concepts & Skills Development</p> <ul style="list-style-type: none"> The process of photosynthesis including the equations word and symbols The two-step reaction of photosynthesis, light dependant and independent steps. The light intensity equation related to the practical . <p>Key Terminology</p> <ul style="list-style-type: none"> Enzyme Organelle Photosynthesis Chloroplast Chlorophyll Light intensity Biomass Rate Limiting factors
Ongoing Assessment	<p>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.</p> <p>Assessment in the form of gap fill, questions and tasks in the topic book, including</p> <ul style="list-style-type: none"> Roles of glucose in a plant table Complete the missing parts- planning a practical Complete graph to light intensity investigation 6 mark questions on factors that affect rate of photosynthesis <p>Key misconceptions:</p>

	<ul style="list-style-type: none"> • Photosynthesis is the same as plant respiration. • Photosynthesis only occurs in leaves where there are pores. • Plants produce oxygen all day long. • Sunlight is food for plants. • Plants get their food from the soil. • All cells contain chloroplasts <p>Homework:</p> <ul style="list-style-type: none"> • Complete light intensity investigation graph • Complete 6 mark question <p>Revision checklist: Specification used as revision checklist in front of topic booklet.</p>
Key Assessment	<p>Practical assessment:-</p> <ul style="list-style-type: none"> • Light intensity investigation graph • End of topic test combined with the topic of enzymes. Closed book 35 minutes. multiple choice questions and a mixture of content and practical questions. • Test will assess key skills and content from specification of this unit: • This is an in-class assessment which will be marked by teachers and feedback provided in the form of next steps which students will respond to. • Data is analysed and a colour is given based on the spread of grades outlined in the T&L policy.
Clear sequencing of content	<p>Students touch upon photosynthesis in plants (Y7) and then move onto the fundamentals in Y8. They cover the word and symbol equation, carry out a basic practical (identifying when a plant is photosynthesising). Stomata Y7</p> <p>In Year 9 they build upon this prior knowledge to look at factors that affect rate of photosynthesis and analysing graphs and data to look at these factors. They develop their practical skills further by investigating how light affects that rate of photosynthesis.</p> <p>The concepts from this topic also underpin many topics beyond B1 such as B2- transport into and out of cells, specialised cells and plant transport as well as 6.1 sampling and conservation.</p>
Links to Careers	<p> https://www.horticulture.org.uk/grow-careers/plant-science-technology/ https://www.rhs.org.uk/education-learning/careers-horticulture/plant-health-scientist https://www.horticulture.org.uk/grow-careers/plant-science-technology/ https://www.rhs.org.uk/education-learning/careers-horticulture/botanist https://www.rhs.org.uk/education-learning/careers-horticulture/ethnobotanist </p> <p>Job profile for botanist and ethnobotanist given in the topic booklet</p>
Diversity and Inclusion	<p>Booklet incorporates images of plants from other areas of the world</p> <p>Article on anthocyanin which is a red pigment found in certain plants- common under the rainforest canopy.</p>

Support	<ul style="list-style-type: none"> • Every student receives handout packs including specification • PowerPoints for each lesson are on SharePoint to help catch up with missed lessons or for students to review content. • Biology support club.- students attend if they wish but those who we think will benefit will be directed to attend through their class teacher. • pp and LAT provided with CGP revision workbooks. • Online revision GCSE Biology (Single Science) - OCR Gateway - BBC Bitesize • Amoeba sisters videos
Challenge	<p>Extension task: research and briefly summarise how energy enters the food chain in these areas, if it is not from light.</p> <p>Various science challenges-</p> <ul style="list-style-type: none"> • RSB Biology challenge for Y9/10 • The Homerton college Cambridge challenge • The imperial collegeFaculty of Natural Sciences: Science and innovation competition • BioArtAttack 3d • BioArtAttack 2D <p>2 stretch and challenge articles with questions to go alongside are provided at the back of the topic booklet.</p>

