




'An ambitious curriculum that meets the needs of all'

Medium Term Planning - Topic: Photosynthesis

Curriculum Intent	
Skills/National Curriculum Links	<p>In addition to working further on objectives from KS2 and the Cells topic, pupils will be taught, following National Curriculum guidelines, the following this topic:</p> <p>Photosynthesis</p> <ul style="list-style-type: none"> the reactants in, and products of, photosynthesis, and a word summary for photosynthesis the dependence of almost all life on Earth on the ability of photosynthetic organisms, such as plants and algae, to use sunlight in photosynthesis to build organic molecules that are an essential energy store and to maintain levels of oxygen and carbon dioxide in the atmosphere the adaptations of leaves for photosynthesis.
Spiritual, moral, social, and cultural development	<p>SMSC: Enable students to develop their self-knowledge of their own body.</p> <p>PSHE/British Values:</p> <p>Skills Builder: Listening (Receiving, retaining and processing info), Speaking (The oral transmission of info and ideas), Problem solving (Find a solution to a situation or challenge), Creativity (imagination and generation of new ideas), Staying positive (The ability to use tactics and strategies to overcome setbacks), aiming high (Set clear and tangible goals), Leadership and teamwork</p>
Numeracy	Ratio, % of oxygen,
Literacy	<p>Vocabulary Tier 2: Reaction, hollow, waxy, rate, aquatic, inhibit, absorbed, wilt,</p> <p>Vocabulary Tier 3: Algae, producer, photosynthesis, chlorophyll, stomata, guard cells, iodine, nitrates, phosphates, potassium, magnesium, deficiency, fertiliser, veins, xylem, phloem,</p> <p>Reading: Following a written method and read risk assessments. Students may be directed to the textbook; this could be in lesson or at home on Kerboodle.</p> <p>Writing: Describing and explaining scientific phenomenon, free response writing for describing precautions taken, use of word mat to promote sentence formation.</p> <p>Oracy: inclusion of BEST resources which are research evidence on common misunderstandings in science, effective diagnostic questioning and formative assessment, constructivist approaches to building understanding, and effective sequencing of key concepts that promote metacognitive talk and dialogue.</p>
Becoming future ready	<p>Careers/Employability:</p> <ul style="list-style-type: none"> - Doctor - Physiotherapist - Pharmacist - Radiologist
Adaptation	Throughout this topic, quality first teaching will provide differentiation:
QFT/SEND Provision	<p>By product: Linear assessments and differentiated practical work.</p> <p>By resource: Lessons are differentiated per class and students, worksheets are coloured blue if support and assessments are linear.</p> <p>By Intervention: by providing different levels of supervision and support</p> <p>By Progressive Questioning: exploring pupils' understanding through interactive dialogue.</p> <p>By Grouping: according to prior attainment, gender, social preference, preferred learning style.</p> <p>By Task: Pupils should be involved in the identification of targets which are meaningful to them and in the selection of an appropriate task from the given range.</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>

Implementation Curriculum Delivery	To be able to:
Learning Outcomes (Core Knowledge)	<p><i>Know</i></p> <ul style="list-style-type: none"> - State where photosynthesis occurs in a plant. - State the products of photosynthesis. - State how to test for the presence of oxygen. <p><i>Apply</i></p> <ul style="list-style-type: none"> - Describe the process of photosynthesis. - State the word equation for photosynthesis. - Carry out an experiment to prove that oxygen is produced during photosynthesis. <p><i>Extend</i></p> <ul style="list-style-type: none"> - Explain the importance of photosynthesis in the food chain. - Explain how the plant obtains the reactants for photosynthesis. - Carry out and record observations for an experiment to prove that oxygen is produced during photosynthesis.
	<p><i>Know</i></p> <ul style="list-style-type: none"> - Name the main structures of a leaf. - State the function of the chloroplasts in a leaf. - Use observations from the underside of a leaf to label a diagram. <p><i>Apply</i></p> <ul style="list-style-type: none"> - Describe the structure and function of the main components of a leaf. - Explain the distribution of the chloroplasts in a leaf. - Make observations of stomata from the underside of the leaf, and record observations as a labelled diagram. <p><i>Extend</i></p> <ul style="list-style-type: none"> - Explain how the structures of the leaf make it well adapted for photosynthesis. - Explain the role of chloroplasts in photosynthesis. - Make observations of stomata from the underside of the leaf, and record as a labelled diagram with annotations.
	<p><i>Know</i></p> <ul style="list-style-type: none"> - Name the minerals required by plants. - State that nitrates are essential for plant growth. - Record measurements of plant growth. <p><i>Apply</i></p> <ul style="list-style-type: none"> - Describe how a plant uses minerals for healthy growth. - Explain the role of nitrates in plant growth. - Record measurements in a table, and calculate arithmetic means of results. <p><i>Extend</i></p> <ul style="list-style-type: none"> - Explain deficiency symptoms in plants. - Explain how proteins are made for plant growth. - Record measurements in a table, and calculate arithmetic means of results, giving answers to the correct number of significant figures.
	<p><i>Know</i></p> <ul style="list-style-type: none"> - Carry out an experiment to test for the presence of starch in a leaf. - List the factors that affect the rate of photosynthesis. - State two experiments which can be used to prove photosynthesis has taken place. <p><i>Apply</i></p> <ul style="list-style-type: none"> - Carry out and record observations for an experiment to test for the presence of starch in a leaf. - State the relationship between temperature, light intensity, and availability of carbon dioxide and the rate of photosynthesis. - State the relationship between temperature, light intensity and availability of carbon dioxide and the rate of photosynthesis. <p><i>Extend</i></p> <ul style="list-style-type: none"> - Carry out and record observations for an experiment to test for the presence of starch in a leaf, explaining results obtained. - Describe why low temperature, shortage of carbon dioxide, and shortage of light limit the rate of photosynthesis. - State and explain which method of investigating photosynthesis could be used to measure the rate of photosynthesis.
	<p><i>Know</i></p> <p>State the factors affecting photosynthesis</p> <p>Understand how the factors can be changed in a greenhouse</p> <p><i>Apply</i></p>

	<p>- State the relationship between temperature, light intensity, and availability of carbon dioxide and rate of photosynthesis.</p> <p>- State the relationship between temperature, light intensity and availability of carbon dioxide and rate of photosynthesis.</p> <p>Extend</p> <p>- Describe why low temperature, shortage of carbon dioxide, and shortage of light limit the rate of photosynthesis.</p>		
Current learning to be developed in the future within:	<p>Before: At KS2 you will have covered the following:</p> <p>Identify and describe the functions of different parts of flowering plants - roots, stem/trunk, leaves and flowers Explored the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant, and investigated the way in which water is transported within plants</p>	<p>Future: At GCSE you learn in more detail about the differences between aerobic and anaerobic respiration. You will learn about the process of photosynthesis, the factors that affect it and how this links to plant growth.</p>	
Assessment	Refer to assessment maps for formative and summative assessment opportunities.		
Impact	Attainment and Progress – Refer to assessment results / data review documentation.		