

Science Year 9– Autumn Term 2021

	<b>What? When? Why?</b>			
	<b>Biology 9B Plant Growth</b>	<b>Chemistry 9E Making Materials</b>	<b>Physics 9J Current Electricity and Electromagnetism</b>	<b>Chemistry 9F Reactivity</b>
Lesson 1 Learning intentions	<p><b><u>Photosynthesis</u></b> Describe photosynthesis as a chemical reaction.</p> <p>Recall the factors surrounding photosynthesis.</p> <p>State the limiting factors of photosynthesis.</p>	<p><b><u>Ceramics</u></b> Explain how the properties of ceramics make them useful.</p> <p>Justify the use of a ceramic material for a given application.</p> <p>Explain why crystal size depends on the speed of cooling.</p> <p>Explain how the properties of a substance depend on the bonding and arrangement of atoms (in terms of strength and number of bonds only).</p>	<p><b><u>Fields</u></b> Describe gravitational potential energy</p> <p>Explain what causes static electricity</p> <p>Compare the diagrams of fields in terms of direction and strength</p>	<p><b><u>Combustion Reactions</u></b> Apply knowledge of explosive reactions to explain why they occur more or less rapidly when the particle size or the oxidiser is changed.</p> <p>Describe how some explosive mixtures obtain enough oxygen to explode.</p> <p>Explain why energy input may be needed to start some reactions or keep them going.</p>
Lesson 2 Learning intentions	<p><b><u>Plant Adaptations</u></b> Describe how gas exchange occurs in plants.</p> <p>Describe the adaptations of leaves and plant cells for photosynthesis.</p> <p>Describe how water and mineral salts are absorbed and moved around a plant.</p> <p>Describe how water is lost from a plant.</p>	<p><b><u>Polymers</u></b> Link the properties of common plastics to their uses.</p> <p>Explain how the properties of a substance depend on the bonding and arrangement of atoms.</p>	<p><b><u>Current Electricity</u></b> Describe how voltage and energy are linked.</p> <p>Describe a current as a flow of electrons.</p>	<p><b><u>Exothermic and Endothermic</u></b> Classify changes as exothermic or endothermic from temperature changes.</p>

	<p>Explain how wilting occurs.</p> <p>Explain how the features of leaves and plant cells are adaptations for photosynthesis.</p> <p>Explain how roots and stems are adapted for their function.</p>			
<p>Lesson 3 Learning intentions</p>	<p><b>Plant Products</b></p> <p>Describe the test for starch.</p> <p>Describe how starch is used as a food storage material.</p> <p>Recall that plants use glucose produced by photosynthesis to make new substances, often using mineral salts.</p> <p>Explain the need for the different resources by a seed as it germinates.</p> <p>Explain the importance of nitrates to plants.</p> <p>Describe the synthesis of starch and proteins in plants (only in terms of the monomers involved).</p> <p>Recall some functions of different proteins.</p>	<p><b>Composites</b></p> <p>Explain how the properties of composites make them useful.</p> <p>Justify the use of a composite material for a given application.</p>	<p><b>Resistance</b></p> <p>Use the formula relating voltage, current and resistance.</p> <p>Plan an investigation into how the resistance of a wire changes with length or thickness.</p> <p>Interpret a voltage–current graph for resistors of different values.</p>	<p><b>Reactivity series</b></p> <p>Explain how metals are placed in the reactivity series.</p> <p>Explain how physical barriers and sacrificial protection prevent rusting.</p>
<p>Lesson 4 Learning intentions</p>	<p><b>Growing Crops</b></p> <p>Describe why plants are cross-bred.</p> <p>Identify the desired outcome of cross-breeding.</p> <p>Describe how increased human population growth affects food supply.</p>	<p><b>Problems with materials</b></p> <p>List types of pollution caused by making materials</p> <p>Research different types of pollution and the problems</p>	<p><b>Electromagnets</b></p> <p>Explain how changing the size or direction of the current affects the magnetic field.</p> <p>Explain how electromagnets are used in relays.</p>	<p><b>Displacement Reactions</b></p> <p>Explain why a displacement reaction may or may not occur.</p> <p>Use evidence to decide whether a displacement reaction has or has not occurred.</p>

	<p>Describe how selective breeding is done.</p> <p>Explain how attack of plants by pests and pathogens can have an impact on human populations.</p> <p>Recall the main nutrients required by plants and identify signs that a plant may be lacking in nutrients (in general terms only).</p> <p>Explain how food production for humans can be increased using different plant varieties and pest management strategies (including insecticides and herbicides).</p>	<p>Explain solutions to tackle these problems</p>		<p>Use results from displacement reactions to produce an order of reactivity.</p>
<p>Lesson 5 Learning intentions</p>		<p><b><u>Recycling</u></b></p> <p>Suggest reasons why recycling is important</p> <p>Explain and give examples of different types of recycling.</p>	<p><b><u>Simple Motors</u></b></p> <p>Describe how a wire carrying a current must be oriented in a magnetic field to produce a force.</p> <p>Describe how the motor effect is used in a simple electric motor and how the force it produces can be changed.</p>	<p><b><u>Extracting Metals</u></b></p> <p>Explain why some elements have been isolated for much longer than others.</p> <p>Explain what happens in oxidation and reduction.</p> <p>Describe how metals are extracted from their ores by heating with carbon and electrolysis</p>
<p>Lesson 6 Learning intentions</p>				<p><b><u>Extraction by Electrolysis</u></b></p> <p>Explain why the method used to extract a metal is related to its position in the reactivity series and cost of the extraction process.</p>