

Purple - PSHE content

Yellow – key words

KS 4 Science Curriculum 2022-2023 Year 9

Curriculum Intent

The science curriculum will provide all pupils, regardless of starting point with the foundation of knowledge needed to allow them to critically analyse and engage with science, technology and nature in the modern world.

Curriculum Implementation

Year	Start When	No of lessons	Topic	Summary	Big Questions	Assessment for learning	Key Practicals
9	Autumn 2	13	Atomic structure and periodic table	This topic builds on the key stage 3 topics of atoms and the periodic table	<p>Explain the difference between Atoms, Elements, and Compounds.</p> <p>Identify the reactants and products.</p> <p>Write simple word equations</p> <p>Include state symbols and balance symbol equations</p> <p>Identify the key separation techniques and when to use each one.</p> <p>Identify the subatomic particles that make up an atom. Explain what the atomic number and mass number show.</p> <p>Describe the key discoveries that have been made to create the atomic model and who made them.</p> <p>Show the electronic structure of the first 20 elements on the periodic table. Explain what an ion is and how they are created</p>	<p>Cold calling</p> <p>Regular check point questions in the lessons</p> <p>Trust wide standardised 45min exam question test.</p>	

					<p>Describe and Explain the stages in the development of the modern periodic table</p> <p>Describe and predict the properties of the elements in Group 1 of the periodic table based on their electron configuration</p> <p>Describe and predict the properties of the elements in Group 7 of the periodic table based on their electron configuration</p> <p>Describe and predict the properties of the elements in Group 0 of the periodic table based on their electron configuration</p> <p>Describe the similarities and Differences between the properties of the Transition Metals and the Alkali Metals</p>		
9	Autumn 2	15	Cell biology	<p>This builds on the KS3 topic of cells and organisation</p>	<p>Recognize, draw, and interpret images of cells (plant, animal and bacterial)</p> <p>Describe the function of major organelles</p> <p>Explain the difference between Eukaryotic and Prokaryotic cells</p> <p>Explain how the structure of some specialised cells relates to function</p> <p>List some advantages and disadvantages of using Electron or Light microscopes</p> <p>Carry out calculations involving magnification, real size and image size</p>	<p>Cold calling</p> <p>Regular check point questions in the lessons</p> <p>Trust wide standardised 45min exam question test.</p>	<p>RP1 – microscopy</p> <p>RP 2 – Osmosis</p> <p>TRP – Culturing bacteria</p>

				<p>Recognize and interpret diagrams of diffusion, osmosis, and active transport</p> <p>Explain how adaptations in the lungs/gills allow for effective exchange of materials</p> <p>State examples of factors that affect the rate of diffusion</p> <p>Plot, draw and interpret a graph of results</p> <p>Calculate percentage gain or loss using given formula</p> <p>Explain how plants get mineral ions from the soil</p> <p>Triple ONLY:</p> <p>Describe how to safely culture, incubate and dispose of a bacterial colony on agar plate</p> <p>Describe and explain the cell cycle</p> <p>Explain how growth occurs in animals</p> <p>Explain how growth occurs in plants</p> <p>Discuss why stem cells are useful and why some may not agree with their use.</p>		
9	Spring 1	11	Bonding-structure and properties	<p>Explain how substances change between solids, liquids and gases</p> <p>Explain what happens if an element gains or loses an electron</p>	<p>Cold calling</p> <p>Regular check point questions in the lessons</p>	

					<p>Describe and explain how metals bond with non-metals</p> <p>Describe and explain the properties of giant ionic structures</p> <p>Describe and explain how non-metals bond with non-metals</p> <p>Describe and explain the properties of giant covalent structures</p> <p>Describe and explain how metals join to other metals</p> <p>What is nanoscience and what are its uses.</p>	Trust wide standardised 45min exam question test.	
9	Spring 1	8	Particle model of matter	<p>This topic builds on the KS 3 particles matter and energy topic</p>	<p>Describe and explain the term density.</p> <p>Be able to calculate the density of a regular shape, irregular shape and a liquid</p> <p>What are the properties of solids, liquids and gases</p> <p>What happens at melting and boiling points</p> <p>What is temperature</p> <p>What is specific latent heat</p> <p>How do particles in a gas behave</p>	<p>Cold calling</p> <p>Regular check point questions in the lessons</p> <p>Trust wide standardised 45min exam question test.</p>	RP - density

9	Spring 2	10	Bioenergetics	<p>This builds on the KS3 topics chemical reactions and energy and ecosystems</p>	<p>What is needed for photosynthesis</p> <p>What factors effect the rate of photosynthesis</p> <p>What are stomata and why are they so important</p> <p>What is the difference between breathing and respiration</p> <p>What is lactic acid and how does it accumulate in the body</p> <p>What changes occur in the body when we exercise</p> <p>What is metabolism</p>	<p>Cold calling</p> <p>Regular check point questions in the lessons</p> <p>Trust wide standardised 45min exam question test.</p>	<p>RP – investigating photosynthesis</p>
9	Summer 1	14	Chemical changes	<p>This topic builds on the KS 3 topics of chemical reactions 1 and 2</p>	<p>How can we tell what reactions metals will have with oxygen, water and acid</p> <p>What is a redox reaction</p> <p>How do we extract metals from the Earth</p> <p>How can we make salts</p> <p>How can we make more salts</p> <p>What is neutralisation</p> <p>What are strong and weak acids</p> <p>What happens in electrolysis</p> <p>What happens at the electrodes</p>	<p>Cold calling</p> <p>Regular check point questions in the lessons</p> <p>Trust wide standardised 45min exam question test.</p>	<p>RP – making salts</p> <p>TRP – Titrations</p>

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