

Long Term Plan – Science (2024-25)

Vision: Our vision is to ignite a passion for science in every student. We strive to create a dynamic, hands-on learning environment where curiosity thrives and students are empowered to explore the wonders of science. Our aim is to develop critical thinkers and problem solvers equipped with the knowledge to address real-world challenges. By integrating sustainable practices and collaborative projects, we prepare students to lead in a rapidly evolving scientific landscape. We are committed to fostering a culture of scientific curiosity and inspiring students to make meaningful contributions to society and the global community.

	HT1	HT2	HT3	HT4	HT5	HT6	Year End Points
Year 7	7.0 Working in a lab 7.1 Cells	7.2 Matter	7.3 Forces 7.4 Reproduction	7.5 Describing motion	7.6 Magnets 7.7 Ecosystems	7.8 Space 7.9 Earth	<p>By the end of year 7 students will know:</p> <p>The structure and function of cells, including the roles of organelles and how to distinguish between plant and animal cells. The process of reproduction in humans and flowering plants, covering topics like fertilisation, growth, and the development of foetus.</p> <p>The interactions within ecosystems, including producers, consumers, decomposers, and the flow of energy through food chains and food webs. The importance of balance within ecosystems and how human activities can impact them.</p> <p>The three states of matter (solid, liquid, and gases), how particles behave in each state, and simple physical and chemical changes, such as melting, boiling, and dissolving. Simple laboratory separation techniques like filtration and distillation.</p> <p>How forces can change the motion of objects, including concepts like gravity, friction, and balanced vs. unbalanced forces. The motion of objects, the speed and direction of objects. Magnetic fields, poles, and the attraction or repulsion between magnets and magnetic materials. The solar system and how Earth's rotation and tilt leads to day and night, seasons, and the concept of gravity as it relates to planets and celestial bodies.</p>

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Year 8	8.1 Nutrition, digestion & health 8.2 Reactions	8.2 Reactions 8.3 Energy	8.4 Gas exchange, diffusion & circulatory system	8.5 Waves	8.6 Periodic table 8.7 Respiration	8.8 Electricity
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By the end of year 8 students will know:

The importance of nutrition and how a balanced diet affects digestion and health. The digestive system, including the roles of organs such as the stomach, intestines, and liver, and how enzymes break down food for absorption. How gas exchange occurs in the lungs and how oxygen is taken into the body and carbon dioxide is removed. How diffusion affects substances moving across cell membranes, such as oxygen and nutrients entering cells. The roles of the heart, blood vessels, and blood in transporting oxygen, nutrients, and waste products throughout the body. Aerobic and anaerobic respiration and how cells use oxygen to release energy from glucose in aerobic respiration, and how energy can be released in the absence of oxygen during anaerobic respiration.

Different types of chemical reactions, including combustion, neutralisation, and oxidation, and observe evidence of chemical changes, such as colour change, temperature change, gas production, and the formation of new substances. The arrangement of elements on the Periodic table based on their atomic number and properties, and identify groups like metals, non-metals, noble gases, alkali metals, and halogens as well as the properties and the chemistry of these groups.

Energy transfers and conservation and how energy can be transferred in systems and stored in different forms, such as kinetic, thermal, and potential energy. The principles of waves, distinguishing between transverse and longitudinal waves and understanding concepts like wavelength, frequency, and amplitude, particularly with sound and light waves. How electricity works in terms of circuits, current, voltage, and resistance, and how series and parallel circuits function.

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<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Year 9</p>	<p style="text-align: center;">9.1 Photosynthesis 9.2 Heating and cooling</p>	<p style="text-align: center;">9.2 Heating and cooling 9.3 Metal reactions and Exo/Endo</p>	<p style="text-align: center;">9.4 Energy transfers 9.5 Genes</p>	<p style="text-align: center;">9.6 Evolution</p>	<p style="text-align: center;">9.7 Pressure 9.8 Structure and bonding</p>	<p style="text-align: center;">9.9 Energy resources</p>	<p>By the end of year 9 students will know:</p> <p>How plants convert light energy into chemical energy through the process of photosynthesis, including the roles of chloroplasts, chlorophyll, carbon dioxide, water, and light. The genetic basis of inheritance and how genes are passed from parents to offspring, the role of DNA in coding for traits, and how genetic variation leads to evolution by natural selection, with examples of adaptation in different species.</p> <p>The chemical reactions of metals, including reactions with water, metal salts, and thermal decomposition reactions. How to predict the products of these reactions, such as the formation of salts, hydrogen, or metal oxides. The difference between exothermic and endothermic reactions, how energy is released or absorbed during chemical reactions and be able to represent these processes with reaction profiles. The atomic structure of atoms, including the arrangement of protons, neutrons, and electrons within atoms, and how chemical bonding occurs through the sharing or transfer of electrons in covalent, ionic, or metallic bonds.</p> <p>How heating and cooling transfers energy by conduction, convection, and radiation, and how materials can act as thermal insulators or conductors. The principles of energy transfers and how energy moves between stores, such as kinetic, thermal, and chemical, and understanding the concept of energy conservation. How pressure works in different contexts, such as in gases and liquids, and how it relates to force and area, with applications like atmospheric pressure and hydraulics. How different energy resources both renewable and non-renewable resources work such as fossil fuels, wind, solar, and nuclear energy, and the environmental and economic impacts of using these resources.</p>
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