

Science Curriculum



	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
<p>Year 5 (2 lessons per week)</p>	<p>Earth and Space Starting with the solar system, students will learn about the movement of the Earth, and other planets, in relation to the sun. Then, focusing on planet Earth, students will learn about the movement of our moon and use information about the Earth's rotation to explain day and night.</p>	<p>Properties & Changes of Materials (1) Students will investigate the characteristics of everyday materials and group them based on properties such as hardness and conductivity. Students will then apply this knowledge to the use of everyday materials such as metal, wood and plastic.</p>	<p>Living things and their habitats Focusing on the five different vertebrate groups, students will learn about their different lifecycles and how reproductive strategies relate to the number of offspring. Then, to deepen their learning, students will investigate the process of reproduction in flowering and non-flowering plants.</p>	<p>Forces Starting with the identification of gravity as a force, students will learn how other forces may affect the movement of an object. To gain a deeper understanding of the benefits of forces students will learn how simple mechanisms, such as levers and gears, have allowed humans to have a greater 'effect'!</p>	<p>Animals, including humans Starting from birth, students will learn about the human life cycle and the different stages of development and growth they have already experienced. Then, with links to the PSHCEE curriculum, students will learn how puberty will affect their bodies and how lifestyle can affect their future development.</p>	<p>Properties & Changes of Materials (2) Through different experiments students will develop an understanding of reversible and irreversible changes. Using their knowledge of solids, liquids and gases, students will learn how to separate a mixture of different substances (including how to dissolve a solid into a liquid and get it back again!)</p>
<p>Year 6 (2 lessons per week)</p>	<p>Living things and their habitats Starting with the early teachings of Aristotle, students will learn how he tried to classify the world around him. Then, using the teachings of Carl Linnaeus, students will use modern classification techniques to classify living things into the different Kingdoms and Classes. Students will then experiment with yeast to identify whether or not it can be classified as a living organism.</p>	<p>Electricity After learning about circuit components and their corresponding symbols, students will progress from building circuits from pictures to building them from circuit diagrams. Once competent at working with circuits, students will investigate the impact of adding/removing cells and components.</p>	<p>Animals, including humans Building on their knowledge of organs in the human body, students will develop a deeper understanding of how their respiration and circulatory systems works. Students will then investigate how external lifestyle factors, such as diet and exercise, can affect their bodies.</p>	<p>Light Starting off by identifying sources of light, students will learn how light travels to their eyes and how they are able to see opaque objects. Students will then investigate the relationship between shadow size and the positions of light source and object.</p>	<p>Evolution and Inheritance After looking at the diary of Mary Anning, students will analyse the evidence of previous life forms (dinosaurs) through the discovery of fossils. Then, by researching the findings of Charles Darwin, students will see how the Theory of Evolution explains adaptation in plants and animals.</p>	<p>Scientific Enquiry Towards the end of the year, after students have taken their end of key stage assessment, students will develop their own experiment to answer a question. To do this they must identify and control variables, accurately measure and record their results before presenting their findings clearly.</p>



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<p style="text-align: center;">Year 7 (4 lessons per week)</p> <p>As of September 2018, pupils in year 7 will be following the AQA scheme of work</p>	<p><u>Enquiry Processes (1)</u> By 'working scientifically', pupils will work in similar ways to scientists.</p> <ul style="list-style-type: none"> • Asking scientific questions • Planning investigations • Collecting, recording, and presenting data • Analysing patterns in data • Evaluating data and methods 	<p><u>Electromagnets (1)</u> In this Big Idea, pupils learn about what is happening in a circuit and how it can be modelled. Pupils learn about what batteries do and how to use circuit components to make circuits do different jobs. Pupils learn about electric charge and how objects can become 'charged'. Pupils will use this idea to explain electric shocks and lightning.</p>	<p><u>Reactions (1)</u> Chemical reactions are very useful. They make new substances such as medicines, fabrics, and building materials. In this 'Big Idea', pupils learn about the chemical reactions of metals and of acids. Pupils find out how to use patterns in properties to predict products and discover how to make salts.</p>	<p><u>Organisms (1)</u> In this 'Big Idea', you will start by finding out why you have a skeleton and how it works together with your muscles to enable movement. Pupils look inside organisms to discover what plants and animals are made of. Finally, pupils meet some tiny organisms that can only be seen under a microscope.</p>	<p><u>Genes (1)</u> In this 'Big Idea', pupils look at these differences and how they are caused. Pupils will think about how variation can help organisms survive in difficult environments. Pupils also learn about human reproduction. Pupils begin by looking at the changes that take place during adolescence, and then discover how new life is created and develops, resulting in the birth of a baby.</p>	<p><u>Waves (1)</u> In a thunderstorm, you see a flash of lightning and hear thunder. Your eyes and ears detect light and sound. In this 'Big Idea', pupils learn about sound and hearing, and what changes when you make sounds of different pitch and loudness. Pupils learn how we see objects and how light behaves when it hits different materials.</p>
	<p><u>Forces (1)</u> What is the link between the Moon orbiting the Earth and a falling object on Earth?</p> <p>In this Big Idea, pupils learn about forces; how they arise, and how they change the motion of an object.</p> <p>Pupils also learn how to measure speed and how to tell the story of a journey with a graph.</p>	<p><u>Matter (1)</u> The batteries in your phone rely on lithium metal. Lithium exists on Earth in rocks and as a lithium chloride solution. How can lithium chloride, and other substances, be separated from their solutions? Pupils find out in this 'Big Idea'.</p> <p>Pupils learn why substances have different properties in solid, liquid, and gas states, and consider what happens when a substance changes from one state to another.</p>	<p><u>Earth (1)</u> Everything we need to live comes from the Earth, the oceans, the air, and the Sun. In this 'Big Idea', pupils find out about what the Earth is made from and its structure. Pupils discover how materials are recycled in the 'rock cycle'. Pupils also learn about the size and scale of our Solar System and galaxy. Pupils find out how the movement of the Earth and Moon explains the observations that we make of the Sun and the night sky.</p>	<p><u>Ecosystem (1)</u> We share our environment with many different types of plants and animals. In this 'Big Idea', pupils learn about how these organisms are connected and how they interact within ecosystems. Pupils will look closely at their feeding relationships and competition between species. Pupils also study the life cycle of a flowering plant and the differences between wind-pollinated and insect-pollinated flowers. Pupils then follow the steps of reproduction from pollination to fertilisation, and finally to germination.</p>	<p><u>Energy (1)</u> In this 'Big Idea', pupils learn about the ways of calculating energy in food and fuels. Pupils find out about the ways we generate electricity and why it is helpful to reduce the time we use appliances. Pupils learn how scientists think about energy, including the idea of dissipation. Pupils will model how energy is transferred between different stores and learn how we can use energy calculations to tell us which processes are possible.</p>	<p>Revision Curriculum Assessment Skills Assessment</p>



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<p style="text-align: center;">Year 8 (4 lessons per week)</p>	<p>Earth & Atmosphere Starting from the structure of planet Earth, students will learn how the formation of rocks leads to their classification as well as how, over time, processes such as weathering and the movement of tectonic plates can lead to the formation of new rocks.</p>	<p>Light Waves Starting with a recap on ray diagrams and reflection, students will explain refraction by referencing the speed of light as well as use wavelengths (and the work of Newton) to explain how a spectrum can be created. Furthermore, through the use of differently coloured opaque objects and light filters will investigate how the human eye is able to see different colours, as well as turn red into black!</p>	<p>Nutrition & Digestion Starting with the NHS 'Eat Well' plate, students will learn the science behind nutrition by experimenting with different foods to discover both the nutrition and of energy within it. Students will use this knowledge to research vitamin and mineral sources before investigating the negative effects of malnutrition. Students will then use their knowledge of their digestive system (and enzymes!) to explain the process of absorption and how glucose is transported around the body.</p>	<p>Patterns in the Periodic Table Building on students' knowledge of elements from Year 7, students will learn how Mendeleev constructed the periodic table using the Bohr Atom Model that will introduce the topic of sub-atomic particles. Then, by using the position of elements within the periodic table, students will predict the reactivity series.</p>	<p>Plants & Photosynthesis Using microscopes, students will use skills in plant dissection to investigate stoma before discovering how the different parts of plants relate to the reactants and products of photosynthesis. Using their knowledge of atoms and chemical reactions, students will link photosynthesis to the Carbon and Nitrogen cycles.</p>	<p>Revision Preparation for end of Key stage assessments.</p>
	<p>Transfer of Thermal Energy Using several small experiments students will investigate the factors that affect the cooling rate of water. Building on this knowledge, students will then apply their knowledge of particles to explain how thermal energy travels through different states of matter (or no matter at all!)</p>	<p>Sound Waves Starting off with a guitar and a drum, students will use their knowledge of particles to explain how sound travels from an object to their ear, as well as use an oscilloscope to draw images of individual sound waves. Students will then discover the anatomy of the human ear before investigating their own hearing range (in comparison to other animals).</p>	<p>Gas Exchange Systems & Respiration Using knowledge of the composition of the atmosphere, students are to investigate the difference between inhaled and exhaled air. Students will then develop a detailed understanding of how breathing leads to the diffusion of oxygen into the blood stream and how our bodies are able to convert oxygen and glucose into energy through cellular respiration.</p>	<p>Chemical Reactions Building on their knowledge of chemical reactions (from Year 7), students will perform a variety of experiments to identify different types of chemical reaction. Using their knowledge of atoms and compounds, students will explain their findings using balanced chemical equations.</p>	<p>Magnetism and Electromagnets To begin the topic students will investigate the properties and field patterns of bar magnets. Then, using the findings of Michael Faraday, students will learn how the invention of the dynamo has paved the way to many other inventions. After students have made their own electromagnet they will plan an investigation into its strength by experimenting with its components.</p>	<p>Scientific Enquiry Using all their skills on scientific enquiry, students will plan an appropriate experiment to answer the question 'Why do penguins huddle?' whilst being able to quantify the benefits.</p>