

# The Science Curriculum at Alverthorpe St Paul's CE School

The National Curriculum programmes of study and the Early Years Foundation Stage Curriculum and expectations for each year group define our science curriculum. As part of the long term plan, the subject leader has allocated science topics to each year group to ensure that children cover and, in many cases, build upon the full range of biology, chemistry and physics as they progress through the school. Rather than being dependent on one particular scheme, it is expected that teachers draw from a range of resources and maximise opportunities for practical 'hands-on' experiences and cross-curricular links.

## Aims of Science

We aim for all children at Alverthorpe St Paul's to:

- learn to love science and have the self-confidence to engage in scientific thinking;
- retain and develop their natural sense of curiosity about the world around them;
- develop knowledge and understanding of important scientific ideas, processes and skills and relate these to everyday experiences;
- learn about ways of thinking and about finding out and communicating ideas;
- explore values and attitudes through science;
- ask as well as answer scientific questions;
- develop the accurate use of scientific vocabulary through a range of enjoyable and interesting experiences;
- develop the skills to plan, carry out and review their own enquiries.



## A Bespoke Curriculum

We adhere to the learning objectives set out in the National Curriculum for each Key Stage; we also go beyond these in some areas. An example of this is in Key Stage 1 where there is no statutory requirement to teach physics, however we feel that there are certain elements of the world around us that cannot be overlooked. Details of this are provided below.

Some units of work have been switched around between Year 3/Year 4 and Year 5/Year 6. This is for reasons of context and consolidation.

**Rocks and Soils** has been moved to Year 4 to link in with the coastal residential.

**Space** has been moved from Year 5 to Year 6 because it was felt that some of the more challenging concepts were better suited to older children. It is also because Space provides a good context for the necessary consolidation of forces and extension learning in the form of balanced and unbalanced forces.

**Micro-organisms** are no longer statutory learning in the National Curriculum, however they are addressed through Year 6's lessons on health and hygiene. In our final year of primary school, all of the human biology work is consolidated as understanding the importance of health and fitness is also an important part of our PE development and assessment.



## What Science looks like at Alverthorpe St Paul's CE School

- Science is linked to practical experiences/hands-on observations.
- Teachers use a variety of teaching methods: modelling, demonstration, use of internet links and video clips, experiments (initiated by the children as much as possible), research, discussion and debate.
- Topics are re-visited but expanded and developed as children move up the school. There is now a much greater emphasis on biology within each year group and opportunities to build on previous learning about healthy lifestyle choices.
- Cross-curricular links are made where possible, particularly in English, Geography and History.
- Computing is used to support the curriculum.
- Relevant discussion is encouraged to develop children's speaking and listening skills.
- Groups are encouraged to communicate their findings in a variety of ways such as diagrams, posters, concept cartoons, mind maps and talking partners.



## Continuity and progression for each Science area

	<b>BIOLOGY</b>	<b>PHYSICS</b>	<b>CHEMISTRY</b>
<b>EY</b>	<p>Shows some understanding that good practices with regard to exercise, eating, sleeping and hygiene can contribute to good health.</p> <p>Eats a healthy range of foodstuffs and understands need for variety in food.</p> <p>Children know the importance for good health of physical exercise, and a healthy diet, and talk about ways to keep healthy and safe. They manage their own basic hygiene and personal needs successfully, including dressing and going to the toilet independently.</p> <p>Comments and asks questions about aspects of their familiar world such as the place where they live or the natural world.</p> <p>Can talk about some of the things they have observed such as plants, animals, natural and found objects.</p> <p>Developing an understanding of growth, decay and changes over time.</p>	<p>Shows understanding of how to transport and store equipment safely.</p> <p>Practices some appropriate safety measures without direct supervision.</p> <p>Shows understanding of the need for safety when tackling new challenges, and considers and manages some risks.</p>	<p>Can talk about some of the things they have observed such as plants, animals, natural and found objects.</p> <p>Children know about similarities and differences in relation to places, objects, materials and living things. They make observations of animals and plants and explain why some things occur, and talk about changes.</p>

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<b>KS1</b>	<p>Observe and describe how seeds and bulbs grow into mature plants.</p> <p>Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.</p> <p>Explore and compare the differences between things that are living, dead, and things that have never been alive.</p> <p>Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets).</p> <p>Identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other.</p> <p>Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals.</p> <p>Identify and name a variety of common animals that are carnivores, herbivores and omnivores.</p> <p>Notice that animals, including humans, have offspring which grow into adults.</p> <p>Find out about and describe the basic needs of animals, including humans, for survival (water, food and air).</p> <p>Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.</p>	<p>(Physics is not statutory in KS1)</p> <p>Light and dark.</p> <p>Identify seasonal and daily weather patterns in the United Kingdom.</p> <p>Observe changes across the four seasons.</p> <p>Observe and describe weather associated with the seasons and how day length varies.</p>	<p>Y1</p> <p>Distinguish between an object and the material from which it is made.</p> <p>Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock.</p> <p>Describe the simple physical properties of a variety of everyday materials.</p> <p>Compare and group together a variety of everyday materials on the basis of their simple physical properties.</p> <p>Y2</p> <p>Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.</p> <p>Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.</p>
<b>Y3</b>	<p>Animals need the right types and amount of nutrition.</p> <p>Function of skeletons and muscles.</p> <p>Functions of different parts of flowering plants.</p> <p>Explore requirements for life and growth and how they vary.</p> <p>Explore the part that flowers play in the life cycle of a flowering plant.</p> <p>Investigate the way water is transported within plants.</p> <p>Explore the part that flowers play in the life cycles of flowering plants.</p> <p>Functions of different parts of flowering plants.</p>	<p>Compare how things move on different surfaces.</p> <p>Unlike some forces, magnetism doesn't require contact between objects.</p> <p>Investigate poles and magnetism.</p> <p>Compare and group materials based on magnetism.</p> <p>Recognise that light enables us to see.</p> <p>Light is reflected from surfaces.</p> <p>Shadows are formed when light is blocked.</p> <p>Investigate how shadows change.</p>	

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<b>Y4</b>	<p>Recognise that living things can be grouped in a variety of ways.</p> <p>Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment.</p> <p>Recognise how environmental changes can pose dangers to living things.</p> <p>Construct and interpret food chains, identifying producers, predators and prey.</p> <p>Describe the simple functions of basic parts of the digestive system.</p> <p>Identify the different types of teeth in humans and their simple functions.</p>	<p>Identify common appliances that run on electricity.</p> <p>Construct a simple series circuit, identifying and naming its basic parts.</p> <p>Identify whether or not a lamp will light in a simple circuit.</p> <p>Recognise that a switch opens and closes a circuit.</p> <p>Investigate conductors and insulators.</p> <p>Identify how sounds are made, associating sound with something vibrating.</p> <p>Recognise that vibrations from sounds travel through a medium to the ear.</p> <p>Investigate the variables that lead to differences in pitch and volume.</p>	<p>Compare and group solids, liquids and gases.</p> <p>Observe that some materials change state when they are heated or cooled and measure the temperature of these changes.</p> <p>Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.</p> <p>Compare and group different kinds of rocks.</p> <p>Describe in simple terms how fossils are formed</p> <p>Recognise that soils are made from rocks and organic matter.</p>
<b>Y5</b>	<p>Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird.</p> <p>Describe the life process of reproduction in some plants and animals.</p> <p>Give reasons for classifying plants and animals based on specific characteristics.</p> <p>Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals.</p> <p>Impact of diet.</p> <p>Circulatory system and functions of the heart, blood vessels and blood.</p> <p>Ways in which nutrients and water are transported within animals, including humans.</p> <p>Impact of exercise.</p> <p>Animals, including humans</p> <p>Impact of drugs (cannabis and solvent abuse)</p> <p>Changes experienced in puberty.</p>	<p>Magnets, gravity and air resistance.</p> <p>Light appears to travel in straight lines.</p> <p>We see when light is reflected from surfaces into our eyes.</p> <p>Investigate light sources, reflections and shadows.</p> <p>Design and make a periscope.</p>	<p>Compare and group according to a range of properties.</p> <p>Dissolving and recovering.</p>
<b>Y6</b>	<p>Links between micro-organisms, puberty and personal hygiene.</p> <p>Revise and extend previous body science learning by focusing on health and disease and how, by thinking well, eating well and moving well, we can help to prevent certain conditions.</p>	<p>Earth, Sun and Moon – movement and relationship.</p> <p>Investigate day and night and the relationship between this and length of shadows.</p> <p>How forces change away from Earth.</p> <p>Balanced and unbalanced forces.</p>	<p>Apply past learning to separate different mixtures using different methods, including sieving and filtering.</p> <p>Investigate more changes which may or may not be reversible.</p>

	<p>First aid workshop. How can alcohol affect health, both physically and mentally? How have living things changed over time? Where does this information come from? Offspring can vary and are not identical to parents, even though they may share certain traits. How can adaptation lead to evolution? A focus on 'nightmares of nature' and how certain animals have evolved over time to become more efficient at killing prey/evading predators.</p>		
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