



Science Curriculum (part 2 ..Physics and Chemistry components) at Sheepscombe Primary School

The Sheepscombe School Community believes that:

At Sheepscombe, we believe curiosity is key to scientific learning. We give special emphasis in inspiring our children to develop a keen sense of curiosity, so that they want to find out about how things work and investigate the underlying science with purpose and enjoyment. To do so, we offer a variety in our curriculum. In our science lessons, we offer children regular opportunities to investigate, experiment and make scientific discoveries in a fun, safe and practical way, using a range of equipment and materials. In our Forest School sessions, children are encouraged to be connected to their local environment through play and enriched learning, where they can discover and explore the wonders of the natural world. We plan regular science-based trips and experiences so to expose them to science in higher and further education as well as in the work place, to stimulate minds motivate - through our relationships with local science-orientated employers, secondary schools, universities and events such as the Cheltenham Science festival.

“Curiosity is mother of inventions”
Albert Einstein. “The important thing is not to stop questioning.

National Curriculum – Aims

The National Curriculum for science aims develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics. To develop understanding of the nature, processes and methods of science through different types of science enquiries that help them to answer scientific questions about the world around them. To ensure children are equipped with the scientific knowledge required to understand the uses and implications of science, today and for the future.

National Curriculum – Purpose of Study

A high-quality science education provides the foundations for understanding the world through the specific disciplines of biology, chemistry and physics. Science has changed our lives and is vital to the world’s future prosperity, and all pupils should be taught essential aspects of the knowledge, methods, processes and uses of science. Through building up a body of key foundational knowledge and concepts, pupils should be encouraged to recognise the power of rational explanation and develop a sense of excitement and curiosity about natural phenomena. They should be encouraged to understand how science can be used to explain what is occurring, predict how things will behave, and analyse causes.

Early Years Foundation Stage

The Early Learning Goal of Understanding the World involves guiding children to make sense of their physical world and their community. The frequency and range of children’s personal experiences increases their knowledge and sense of the world around them. In addition, listening to a broad selection of stories, non-fiction and poems develops their understanding of our culturally, socially, technologically and ecologically diverse world. Our children get to explore the world around them, making observations and beginning to find out answers to the questions that they have or that are posed to them. They learn about some similarities and differences between the world around them and contrasting environments, drawing on their experiences and what has been read in class. Children are supported to understand some important processes and changes in the natural world, including changing states of matter. We give our children frequent opportunities to take part in child led, play based learning activities which act as a stimulus to learn and talk about aspects of science. We encourage children to use the correct vocabulary as they talk about what they are doing and finding out.

In EYFS and KS1 all children will:
At Sheepscombe we will work scientifically and carry out investigations in Physics and Chemistry.
In mixed age classes, children will complete many of the same science investigations but the knowledge base and skills development are pitched for the year group as laid out in the criteria below. This leaves scope for aspirational teaching matched to need, allowing each child to think deeply and to reach their full potential.
We use the Developing Experts resources to teach Science.
In Key Stage 2 all children will: see a development in the progression of Working Scientifically skills whilst also seeing a broadening of children’s scientific knowledge in Physics and Chemistry. We use the Developing Experts resources to teach Science.

Merlin Class				Kestrel Class		Eagle Class	
Little Lambs	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Explore and experiment with different materials, using all their senses to investigate them. Manipulate and play with different materials	Know that are lots of different materials that things are made from. Know that materials have names and we use those names to describe the material. Know that materials have special properties that mean they are good for making certain things.	Working scientifically Ask simple questions and recognise that they can be answered in different ways. Perform simple tests using equipment. Identify and classify.	Working scientifically Ask simple questions using scientific language. Perform simple comparative tests Identify, group and classify, noticing similarities and differences.	Working Scientifically Ask relevant questions and use different types of scientific enquiries to answer them Make systematic and careful observations and, where appropriate, take accurate measurements.	Working Scientifically Use scientific evidence to ask relevant questions, using different types of scientific enquiries to answer them. Set up simple practical enquiries, including comparative and fair tests. Make systematic, careful observations and take accurate measurements, using a range of equipment.	Working Scientifically Plan different types of scientific enquiries and use test results to make predictions to set up further comparative fair test. Take measurements, using a range of scientific equipment, with increasing accuracy and precision. Report and present findings from enquiries, in	Working Scientifically Plan different types of scientific enquiries and record data and results of increasing complexity. Describe and evaluate their own and other people’s scientific ideas related to topics in the national curriculum (including ideas that have changed

Begin to explore and talk about different forces they can feel. Draw children’s attention to forces. Plan and introduce new vocabulary related to the exploration and encourage children to use it. Talk about the differences between materials and changes they notice Provide children with opportunities to change materials from one state to another. Suggestions: • cooking – combining different ingredients, and then cooling or heating (cooking) them • melting – leave ice cubes out in the sun, see what happens when you shake salt onto them (children should not touch to avoid danger of frostbite) Begin to explore how different materials sink and float Begin to explore how you can shine light through some materials, but not others.	Explore at an early age how the shape of materials can be altered by squashing, bending, twisting and squeezing Use their imagination as they consider what they can do with different materials. Explore different materials freely, develop their own ideas and then decide which materials to use to express them. Join different materials and explore different textures. Begin to distinguish between an object and the material from which it is made. Begin to identify, name and describe a variety of everyday materials Begin to explore and talk about different forces they can feel. Suggestions: • how the water pushes up when they try to push a plastic boat under it • how they can stretch elastic, snap a twig, but cannot bend a metal rod • magnetic attraction and repulsion Begin to investigate shadows. Develop further understanding of the changing states of matter Explore how different materials sink and float Explore how you can shine light through some materials, but not others.	Gather and record data and observations to help in answering questions. Materials and their Properties Distinguish between an object and the material from which it is made. Identify, name and describe a variety of everyday materials, including wood, plastic, glass, metal, water, and rock. Compare and group together a variety of everyday materials on the basis of their simple physical properties.	Gather and record data and observations to help in answering questions including from secondary sources of information. Materials Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses Describe how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching	Record and report findings using simple scientific language, drawings, charts and diagrams. Use results to draw simple conclusions and make predictions. Forces and Magnets Compare how things move on different surfaces. Notice that some forces need contact between two objects, but magnetic forces can act at a distance. Observe and predict how magnets attract or repel each other and attract some materials and not others. Describe magnets as having two poles. Light Recognise that he/she needs light in order to see things and that dark is the absence of light. Notice that light is reflected from surfaces. Recognise that light from the sun can be dangerous and that there are ways to protect eyes. Recognise that shadows are formed when the light from a light source is blocked by a solid object and how the size of shadows change.	Record and report findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables. Use results to draw simple conclusions; make predictions for new values, suggest improvements and raise further questions (Year 4 focus) Electricity Construct a simple series electrical circuit, identifying and naming its basic parts and their functions – open and close a circuit, predict if lamp will light. Recognise some common conductors and insulators and associate metals with being good conductors. Sound Identify how sounds are made, recognising that vibrations from sound travel through a medium to the ear. Find patterns in sound, including pitch and volume. Recognise that sounds get fainter as the distance from the sound source increases. States of Matter Compare and group materials together, according to whether they are solids, liquids or gases. Observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C) Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.	oral and written forms such as displays and other presentations Identify scientific evidence that has been used to support or refute ideas or arguments. Earth and Space Describe the movement of the Earth, Moon, and other planets in the solar system. Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky. Force and Magnets Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object. Identify the effects of air resistance, water resistance and friction that act between moving surfaces. Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect. Materials Compare and group together everyday materials on the basis of their properties. Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating. Demonstrate a knowledge of reversible and irreversible changes.	over time), using evidence from a range of sources. Find things out using a wide range of secondary sources of information. Use appropriate scientific language and ideas from the national curriculum to explain, evaluate and communicate his/her methods and findings. Electricity Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit. Use recognised symbols when representing a simple circuit in a diagram. Light Recognise that light appears to travel in straight lines and use the idea to explain that objects are seen because they give out or reflect light into the eye. Explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes. Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.
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