

Brookland Junior School

Science Curriculum Overview



Intent

We at Brookland create a space where children are inspired and motivated to explore and build on their understanding of science in the world around them, through a range of different approaches that purposefully prepare them for the future. There is a culture to ask and investigate questions and foster a sense of awe and wonder. Together we build on pupils natural curiosity, knowing and drawing upon the work of famous scientists and are inspired to follow in their footsteps.

Our Key Principles to achieve this are:

We learn through a range of engaging, practical and memorable methods

We can talk confidently about the science in and around us using scientific language

We ask questions and have the tools and skills to get an answer

We work collaboratively and make learning accessible to all

We can take and apply our learning to the world around us

Implementation

We ensure high standards of teaching and learning in science through implementing a curriculum that is progressive, highlights key skills and the five investigative types, is engaging and adapted to pupils needs throughout the school. Through using a wide range of resources and the facilities local to us, we are able to support teachers in their planning and implementation of the science curriculum. This enables the science planners to engage pupils' interests, use support staff effectively and include current events where appropriate. We build upon the vocabulary, knowledge and skill development of the previous years including the Infant curriculum and develops reflective thinkers who can evaluate their work. As the children's knowledge and understanding increases, they become more proficient in selecting, using scientific equipment, collating and interpreting results, they become increasingly confident in their growing ability to come to conclusions based on real evidence. The 'Brookland Toolkit' and Working Scientifically skills are embedded into lessons to ensure that skills are systematically developed throughout the children's school career and new vocabulary and challenging concepts are introduced in-keeping with the topics in a collaborative learning style.

"We have learnt more things so we can think about more things and link them and we can discover more because we know more. I can write in more detail in lessons and use more scientific vocabulary."

Regular events, such as Science Week or investigation weeks allow all pupils to come off-timetable, to provide broader provision and the acquisition and application of knowledge and skills whilst including families and external visitors.

Impact

Our approach successfully creates an engaging, high quality and practical curriculum based on knowledge and understanding of the world around them. Pupils are demonstrating an enthusiasm and enjoyment of science, seeking out knowledge and participating eagerly in science club and focus weeks. Pupils are demonstrating more depth to their understanding of science both in class and through pupil's voice, as well as showing they are remembering more content over time. Through asking and answering their own questions, pupils are working scientifically, learning and embedding skills that will see them succeed and thrive both in their school career and beyond. Our impact is highlighted through the PSQM Gilt award that we are currently working towards thinking more thoroughly about next steps and what will happen and using prior learning in science to help pupils when they do experiments to understand more.

(Working scientifically skills in red link with scientific skills listed below this chart)

Year 3 Science Overview

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 3 Science Unit Skills	Working Scientifically and key skills (materials focus) (1,5, 6, 7, 8, 9)	Forces and magnets (1, 2, 3, 4, 7)	Rocks (1, 2, 7, 9)	Animals including humans (nutrition, healthy eating, skeletons, muscles) (2, 3, 9)	Plants (1, 2, 7, 8)	Light (1, 2, 7, 9)
		<p>Compare how things move on different surfaces.</p> <p>Notice that some forces need contact between two objects, but magnetic forces can act at a distance.</p> <p>Observe how magnets attract or repel each other and attract some materials and not others.</p> <p>Compare and group together a variety of everyday materials on the</p>	<p>Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties.</p> <p>Describe in simple terms how fossils are formed when things that have lived are trapped within rock.</p> <p>Recognise that soils are made from rocks and organic matter.</p>	<p>Identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat.</p> <p>Identify that humans and some other animals have skeletons and muscles for support, protection and movement.</p>	<p>Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers</p> <p>Explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant.</p> <p>Investigate the way in which water is transported within plants.</p>	<p>Recognise that they need light in order to see things and that dark is the absence of light.</p> <p>Notice that light is reflected from surfaces.</p> <p>Recognise that light from the sun can be dangerous and that there are ways to protect their eyes.</p> <p>Recognise that shadows are formed when the light from a light source is blocked</p>

		<p>basis of whether they are attracted to a magnet, and identify some magnetic materials.</p> <p>Describe magnets as having two poles.</p> <p>Predict whether two magnets will attract or repel each other, depending on which poles are facing</p>			<p>Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.</p>	<p>by a solid object.</p> <p>Find patterns in the way that the size of shadows change.</p>
<p>Year 3</p> <p>Working Scientifically</p>	<ol style="list-style-type: none"> 1. Beginning to use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions. 2. Beginning to identify differences, similarities or changes related to simple scientific ideas and processes. 3. Beginning to use straightforward scientific evidence to answer questions or to support their findings. 4. Beginning to report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions. 5. Beginning to gather, record, classify and present data in a variety of ways to help in answering questions. 6. Beginning to record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables. 7. Beginning to set up simple practical enquiries, comparative and fair tests. 8. Beginning to make systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers. 9. Beginning to ask relevant questions and using different types of scientific enquiries to answer them. 					

Year 4 Science Overview

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 4	Electricity (1,3,4,5,6,8,9)	Sound (1,2,3,4,5,7,8,9)	Animals including humans (food-chains, teeth) (2,3,4,5,6)	Animals including humans (digestive system) (2,4,5,6)	Living things and their habitats (keys, grouping, environments) (2,4,5,6)	States of Matter (1,3,4,5,6,7,8,9)
Year 4 Science Unit Skills	<p>Identify common appliances that run on</p> <p>Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers.</p> <p>Identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery.</p> <p>Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp</p>	<p>Identify how sounds are made, associating some of them with something vibrating.</p> <p>Recognise that vibrations from sounds travel through a medium to the ear.</p> <p>Find patterns between the pitch of a sound and features of the object that produced it.</p> <p>Find patterns between the volume of a sound and the strength of the vibrations that produced it.</p>	<p>Construct and interpret a variety of food chains, identifying producers, predators and prey.</p> <p>Identify the different types of teeth in humans and their simple functions.</p>	<p>Describe the simple functions of the basic parts of the digestive system in humans</p>	<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 that environments can change and that this can sometimes pose dangers to living things.</p>	<p>Compare and group materials together, according to whether they are solids, liquids or gases.</p> <p>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).</p> <p>Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with</p>

	lights in a simple series circuit. Recognise some common conductors and insulators, and associate metals with being good conductors.	Recognise that sounds get fainter as the distance from the sound source increases.				temperature.
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Year 4 Working Scientifically	<ol style="list-style-type: none"> 1. Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions. 2. Identifying differences, similarities or changes related to simple scientific ideas and processes. 3. Using straightforward scientific evidence to answer questions or to support their findings. 4. Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions. 5. Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions. 6. Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables. 7. Setting up simple practical enquiries, comparative and fair tests. 8. Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers. 9. Asking relevant questions and using different types of scientific enquiries to answer them
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Year 5 Science Overview

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 5	Forces (1,2,3,4,5,6)	Earth And Space (1) (1,2,3,6)	Earth And Space (2) (2,3,6)	Living Things And Their Habitats (Life Cycles) (1,6)	Animals Including Humans (Phse Link/Puberty) (1,4,6)	Properties And Changes Of Materials (1,2,3,4,5,6)
Year 5 Science Unit Skills	<p>Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object.</p> <p>Identify the effects of air resistance, water resistance and friction, that act between moving surfaces.</p> <p>Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a</p>	<p>Describe the movement of the Earth, and other planets, relative to the Sun in the solar system.</p> <p>Describe the movement of the Moon relative to the Earth.</p>	<p>Describe the Sun, Earth and Moon as approximately spherical bodies.</p> <p>Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.</p>	<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>Describe the changes as humans develop to old age.</p> <p>Describe how vaccines have developed and helps support human health.</p>	<p>Compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets.</p> <p>Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution.</p> <p>Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating.</p> <p>Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including</p>

	greater effect.					<p>metals, wood and plastic.</p> <p>Demonstrate that dissolving, mixing and changes of state are reversible changes. .</p> <p>Explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda.</p>
<p>Year 5</p> <p>Working Scientifically</p>	<ol style="list-style-type: none"> 1. Beginning to identify scientific evidence that has been used to support or refute ideas or arguments. 2. Beginning to plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. 3. Beginning to take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate. 4. Beginning to record data and results of using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. 5. Beginning to use test results to make predictions to set up further comparative and fair tests. 6. Beginning to report and represent findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations. 					

Year 6 Science Overview

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 6	<p>Living things and their habitats (classification)</p> <p>(1,4,6)</p>	<p>Evolution and inheritance</p> <p>(1,6,4)</p>	<p>Light</p> <p>(2,3,4,6)</p>	<p>Animals including humans (circulatory system etc)</p> <p>(2,3,4,5,6)</p>	<p>Electricity</p> <p>(2,3,6)</p>	<p>Working Scientifically / TASC wheel</p> <p>(2,3)</p>
Year 6 Science Unit Skills	<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>Give reasons for classifying plants and animals based on specific characteristics.</p>	<p>Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago.</p> <p>Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents.</p> <p>Identify how animals and plants are adapted to suit their environment in different ways and that</p>	<p>Recognise that light appears to travel in straight lines.</p> <p>Use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye.</p> <p>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.</p> <p>Use the idea that light travels in straight lines to explain why shadows have the same shape</p>	<p>Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood.</p> <p>Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function.</p> <p>Describe the ways in which nutrients and water are transported within animals, including humans.</p>	<p>Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit.</p> <p>Compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches.</p> <p>Use recognised symbols when representing a simple circuit in a diagram.</p>	<p>To work collaboratively to explore ways to separate reversible changes in a mixture</p> <p>To plan a scientific enquiry to answer questions, including recognising and controlling variables where necessary</p> <p>To report and present my findings and explain my results scientifically</p>

adaptation may lead to evolution.

as the objects that cast them.

Year 6

Working Scientifically

1. Identifying scientific evidence that has been used to support or refute ideas or arguments.
2. Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.
3. Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.
4. Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.
5. Using test results to make predictions to set up further comparative and fair tests.
6. Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations.