

Highbank Primary and Nursery School **Progression Map** **Science**



At Highbank, we have an enquiry rich Science curriculum to help encourage and promote children's natural curiosity about the world around them. We follow the National curriculum programme of study which ensures that children develop their scientific knowledge through specific subjects of biology, chemistry and physics and develop their methods of science through a variety of enquiries.

As part of our HEART values, we aim for children to be respectful of the world, their community and are able to continually develop their understanding of the ever-changing world. Through theme weeks and STEM based experiments and projects, we hope that the children will broaden their knowledge and gain ambition about their future and what they can achieve. Throughout the year, we focus on the importance of being healthy and safe through working closely with the PE leader and ensure that children understand the impact of exercise and healthy eating for their long-term health and wellbeing.

As a school, we have topics which focus on the teaching of science through looking at local and global issues (Us and our world & The Natural world) and passion projects which aim to highlight to the children how they can make a difference to the lives of other people. We want our children to develop their learning so that, upon leaving, they are empowered to become a scientist. They move beyond stereotypes of what it means to be a scientist and have a deep knowledge and understanding which means they are fully prepared for the next stage in their learning.

We have a science theme week which is in line with British Science week. During this theme week, we teach science units that do not naturally fit in with the school overall themes and invite visitors to run assemblies and workshops. This ensure broad coverage of Science each and every year.

SCIENCE YEARLY OVERVIEW

Y1	Seasonal changes	Everyday materials	Animals, including humans	Plants	
Y2	Animals, including humans	Uses of everyday materials	Plants	Living things and their habitats	
Y3	Forces and magnets	Animals, including humans	Rocks	Plants	Light
Y4	Sound	Electricity	Animals, including humans	Living things and their habitats	States of matter
Y5	Living things and their habitats	Earth and space	Animals, including humans	Forces	Properties and changes of materials
Y6	Animals including humans	Light	Electricity	Evolution and inheritance	Living things and their habitats

Links to learning in EYFS

In EYFS, we follow the EYFS framework and Development matters to help children develop their natural curiosity of the world around them. We provide lots of opportunities for exploration of natural materials and of the outdoors, through trips, visits and by using the school sensory garden and outdoor provision. We follow the children's interests and allow them to explore and ask questions independently.

As well as this, our Summer 2 topics' focus on science in line with the whole school theme of the 'Natural World'.



SCIENCE KNOWLEDGE - PROGRESSION

	Yr1	Yr2	Yr3	Yr4	Yr5	Yr6
Animals, including humans	Identify and name a range of animals by amphibian, reptile, mammal, fish and birds. Know and classify animals by what they eat (carnivore, herbivore and omnivore). Know the name of parts of the human body that can be seen and say which part of the body is associated with each sense.	Know the basic stages in a life cycle for animals (including humans). Know the basic needs of animals, including humans, for survival (water, food and air). Know why exercise, a balanced diet and good hygiene are important for humans.	Understand the importance of a nutritious, balanced diet for animals and humans. Know how nutrients, water and oxygen are transported within animals and humans. Know that humans cannot make their own food and they get nutrition from what they eat. Know that humans and some animals have skeletons and muscles for support, protection and movement.	Identify and name the parts of the human digestive system. Know the functions of the organs in the human digestive system. Know that humans have four types of teeth and their simple functions. Know that living things can be classified as producers, predators and prey according to their place in the food chain.	Understand the different stages of growth in humans and explain them using a timeline.	Identify and name the main parts of the human circulatory system. Know the function of the heart, blood vessels and blood. Know the impact of diet, exercise, drugs and lifestyle on health. Know the ways in which nutrients and water are transported in animals, including humans.
Materials	Know that objects can be made out of different materials. Objects (e.g. a chair) are different to the materials they are made from (e.g. plastic and metal). Name and identify a variety of everyday materials, including wood, plastic, glass, metal, water and rock. Know and describe the simple physical properties of a variety of everyday materials. Compare and group together a variety of everyday materials on the basis of their simple physical properties.	Know how materials can be changed by squashing, bending, twisting and stretching. Know why a material might or might not be used for a specific job.	Know that rocks can be classified based on their physical appearance and physical properties. Know how soil is made and how fossils are formed when things that have lived are trapped within rock. Know that rocks are a natural material and can be hard or soft.	Know the temperature at which materials change state. Know about and explore how some materials can change state when they are heated or cooled. Know the part played by evaporation and condensation in the water cycle. Know that materials can be grouped based on their state of matter (solid, liquid, gas).	Compare and group materials based on their properties (e.g. hardness, solubility, transparency, conductivity). Explain how a material dissolves to form a solution. Show how to recover a substance from a solution. Demonstrate how materials can be separated (e.g. filtering, sieving, evaporating). Demonstrate that some changes are irreversible and some are not. Know how some changes result in the formation of new material and that this is usually irreversible. Know the reasons for the particular uses of everyday materials, including metals, wood and plastic, based on evidence from comparative and fair tests.	
Plants	Know and name a variety of common wild and garden plants. Know and name the basic structure of a plant. Know and name the basic structure of a tree.	Observe and describe how seeds and bulbs grow into plants. Know what plants need in order to grow and stay healthy (water, light and suitable temp)	Know the function of different parts of flowering plants and trees. Know that the roots absorb water and nutrients from the soil and the stem transports water/nutrients around the plant. Know 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. Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.			
Living things and their habitats		Know the difference between things that are living, dead and things that have never been alive. Know how a specific habitat provides for the basic needs of things living there (plants and animals). Identify and name a variety of plants and animals in their habitats, including microhabitats. Know that a habitat is a natural environment for different plants and animals (seashore, woodland, ocean). Describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food.		Know that classification keys can be used to group, identify and name living things in the local and wider environment. Know how changes to an environment could endanger living things	Know the life cycle of different living things, e.g. mammal, amphibian, insect and bird. Know the differences between different life cycles. Know the processes of reproduction in some plants. Know the processes of reproduction in animals.	Know that living things can be grouped, according to observable characteristics and based on similarities and differences, including micro-organisms, plants and animals. Know how living things have been classified. Know the reason for classifying plants and animals in a specific way.

Light and sound			Know that dark is the absence of light. Know that light is needed in order to see and is reflected from a surface. Know and demonstrate how a shadow is formed and explain how a shadow changes shape. Know about the danger of direct sunlight and describe how to keep protected.	Know how sound is made, associating some of them with vibrating. Know how sound travels from a source to our ears. Know the correlation between pitch and the object producing a sound. Know the correlation between the volume of a sound and the strength of the vibrations that produced it. Know what happens to a sound as it travels away from its source.		Know how light travels. Know and demonstrate how we see objects. Know why shadows have the same shape as the object that casts them, using the idea that light travels in straight lines. Know how simple optical instruments work e.g., telescope, binoculars, mirror, magnifying glass etc. Know that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes.
Forces and magnets			Know about and describe how objects move on different surfaces. Know how a simple pulley works and use to lift an object. Know how some forces require contact and some do not, giving examples. Know about and explain how magnets attract and repel. Predict whether magnets will attract or repel and give a reason. Describe magnets as having 2 poles.		Know what gravity is and its impact on our lives. Know that air resistance, water resistance and friction are contact forces that act between moving surfaces. They all affect the speed of a moving object. Know that levers, pulleys and gears help us to move objects around by allowing a small force to have a greater effect than by itself.	
Electricity				Know the names of appliances that require electricity to function. Know that an electrical circuit consists of a cell or battery connected to a component using wires. Know the names of the components in a series circuit. Predict and test whether a lamp will light within a circuit. Know the function of a switch. Know the difference between a conductor and an insulator and associate metals with being good conductors.		Understand and give reasons why components work and do not work in a circuit, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches. Know the recognised symbols to use when drawing circuit diagrams. Know how the number and voltage of cells in a circuit links to the brightness of a lamp or the volume of a buzzer.
Miscellaneous	SEASONAL CHANGES Know the name of the seasons and know about the type of weather in each season. Observe how day length varies. Understand that it is not safe to look directly at the sun, even when wearing dark glasses.				EARTH AND SPACE Know about and explain the movement of the Earth and other planets relative to the sun. Know about and explain the movement of the Moon relative to the Earth. Know and demonstrate how night and day are created, using the idea of Earth's rotation and the apparent movement of the sun across the sky. Know that the Sun, Earth and Moon are approximately spherical.	EVOLUTION AND INHERITANCE Know how the Earth and living things have changed over time. Know how fossils can be used to find out about the past. Know about reproduction and offspring (recognising that offspring normally vary and are not identical to their parents). Know how animals and plants are adapted to suit their environment. Link adaptation over time to evolution.

Working Scientifically - Progression

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<p>Asking simple questions and recognising that they can be answered in different ways</p> <p>Develop ability to ask questions such as what something is, how things are similar and different. Where appropriate, answer these questions. Answer questions developed with teacher, often through a scenario. Plan how to use resources provided to answer questions using different types of enquiry.</p>	<p>Asking simple questions and recognising that they can be answered in different ways</p> <p>Develop ability to ask questions such as what something is, how things are similar and different, the ways things work, which alternative is better, how things change and how they happen. Where appropriate, answer these questions. Answer questions developed with teacher, often through a scenario. Plan how to use resources provided to answer questions using different types of enquiry.</p>	<p>Asking relevant questions and using different types of scientific enquiries to answer them</p> <p>Consider prior knowledge when asking questions. Independently use a range of question stems. Where appropriate, answer these questions. Answer questions posed by the teacher.</p>	<p>Asking relevant questions and using different types of scientific enquiries to answer them</p> <p>Consider prior knowledge when asking questions. Independently use a range of question stems. Where appropriate, answer these questions. Answer questions posed by the teacher. Decide how to gather evidence to answer questions. Recognise when secondary sources can be used to answer questions that cannot be answered through practical work. Identify the type of enquiry that they have chosen to answer the question.</p>	<p>Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary</p> <p>Independently ask scientific questions stimulated by a scientific experience or based on developed understanding following an enquiry. Decide how to gather evidence to answer a scientific question. Choose a type of enquiry to carry out and justify their choice.</p>	<p>Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary</p> <p>Independently ask scientific questions stimulated by a scientific experience or based on developed understanding following an enquiry. Decide how to gather evidence to answer a scientific question. Choose a type of enquiry to carry out and justify their choice. Recognise how secondary sources can be used to answer questions that cannot be answered through practical work.</p>
<p>Observing closely, using simple equipment</p> <p>Explore the world around them. Make careful observations to support identification, comparison and noticing change. Use appropriate senses, aided by equipment such as magnifying glasses or digital microscopes, to make observations. Begin to take measurements, initially by comparisons, then using non-standard units.</p>	<p>Observing closely, using simple equipment</p> <p>Explore the world around them. Make careful observations to support identification, comparison and noticing change. Use appropriate senses, aided by equipment such as magnifying glasses or digital microscopes, to make observations. Begin to take measurements, initially by comparisons, then using non-standard units.</p>	<p>Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers</p> <p>Make systematic and careful observations using a range of equipment for measuring length, time, temperature and capacity. Use standard units for their measurements.</p>	<p>Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers</p> <p>Make systematic and careful observations using a range of equipment for measuring length, time, temperature and capacity. Use standard units for their measurements.</p>	<p>Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate</p> <p>Select measuring equipment to give the most precise results e.g. ruler, tape measure or trundle wheel, force meter with a suitable scale. During an enquiry, make decisions e.g. whether to: take repeat readings (fair testing); increase the sample size (pattern seeking); adjust the observation period and frequency (observing over time); in order to get accurate data.</p>	<p>Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate</p> <p>Select measuring equipment to give the most precise results. During an enquiry, make decisions e.g. whether to: take repeat readings (fair testing); increase the sample size (pattern seeking); adjust the observation period and frequency (observing over time); or check further secondary sources (researching); in order to get accurate data.</p>
<p>Performing simple tests</p> <p>Use practical resources provided to gather evidence to answer questions. Carry out: tests to classify; comparative tests; pattern seeking enquiries; make observations over time.</p>	<p>Performing simple tests</p> <p>Use practical resources provided to gather evidence to answer questions. Carry out: tests to classify; comparative tests; pattern seeking enquiries; make observations over time.</p>	<p>Setting up simple practical enquiries, comparative and fair tests</p> <p>Select from a range of practical resources to gather evidence to answer questions. Follow plan to carry out: observations and tests to classify; comparative and simple fair tests; observations over time; and pattern seeking.</p>	<p>Setting up simple practical enquiries, comparative and fair tests</p> <p>Select from a range of practical resources to gather evidence to answer questions. Follow plan to carry out: observations and tests to classify; comparative and simple fair tests; observations over time; and pattern seeking.</p>	<p>Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary</p> <p>Select from a range of practical resources to gather evidence to answer their questions. Carry out fair tests by recognising and controlling variables. Decide what observations or measurements to make. Look for patterns and relationships using a suitable sample. Present the same data in different ways in order to help with answering the question.</p>	<p>Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary</p> <p>Select from a range of practical resources to gather evidence to answer their questions. Carry out fair tests by recognising and controlling variables. Decide what observations or measurements to make. Look for patterns and relationships using a suitable sample. Present the same data in different ways in order to help with answering the question.</p>
<p>Identifying and classifying</p> <p>Use observations and testing to compare objects, materials and living things. Sort and group these things, identifying own criteria for sorting.</p>	<p>Identifying and classifying</p> <p>Use observations and testing to compare objects, materials and living things. Sort and group these things, identifying own criteria for sorting. Use simple secondary sources to name living things. Describe characteristics used to identify.</p>	<p>Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions. Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables</p> <p>Sometimes decide how to record and present evidence. Record observation e.g. using photographs, videos, pictures, labelled diagrams or writing. Record measurements e.g. using tables, tally charts and bar charts (given templates, if required, to which they can add headings). Record classifications.</p>	<p>Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions. Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables</p> <p>Sometimes decide how to record and present evidence. Record observation e.g. using photographs, videos, pictures, labelled diagrams or writing. Record measurements e.g. using tables, tally charts and bar charts. Record classifications.</p>	<p>Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs</p> <p>Decide how to record and present evidence. Record observations e.g. using annotated photographs, videos, labelled diagrams, observational drawings, labelled scientific diagrams or writing. Record measurements e.g. using tables, tally charts, bar charts, line graphs and scatter graphs. Record classifications e.g. using tables, Venn diagrams, Carroll diagrams and classification keys.</p>	<p>Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs</p> <p>Decide how to record and present evidence. Record observations e.g. using annotated photographs, videos, labelled diagrams, observational drawings, labelled scientific diagrams or writing. Record measurements e.g. using tables, tally charts, bar charts, line graphs and scatter graphs. Record classifications e.g. using tables, Venn diagrams, Carroll diagrams and classification keys.</p>
<p>Gathering and recording data to help in answering questions</p> <p>Record observations e.g. using photographs, videos, drawings, labelled diagrams or writing. Record measurements e.g. using prepared tables, pictograms, tally charts and block graphs. Classify using simple prepared tables and sorting rings.</p>	<p>Gathering and recording data to help in answering questions</p> <p>Record observations e.g. using photographs, videos, drawings, labelled diagrams or writing. Record measurements e.g. using prepared tables, pictograms, tally charts and block graphs. Classify using simple prepared tables and sorting rings.</p>	<p>Using straightforward scientific evidence to answer questions or to support their findings</p> <p>Answer own and others' questions based on observations made, measurements taken or information gained from secondary sources. Answers are consistent with the evidence.</p>	<p>Using straightforward scientific evidence to answer questions or to support their findings</p> <p>Answer own and others' questions based on observations made, measurements taken or information gained from secondary sources. Answers are consistent with the evidence.</p>	<p>Identifying scientific evidence that has been used to support or refute ideas or arguments</p> <p>Answer own and others' questions based on observations made, measurements taken or information they have gained from secondary sources. Discuss whether other evidence e.g. from other groups, secondary sources and their scientific understanding, supports or refutes the answer.</p>	<p>Identifying scientific evidence that has been used to support or refute ideas or arguments</p> <p>Answer own and others' questions based on observations made, measurements taken or information they have gained from secondary sources. Discuss whether other evidence e.g. from other groups, secondary sources and their scientific understanding, supports or refutes the answer. Talk about how scientific ideas change due to new evidence</p>

<p>Using their observations and ideas to suggest answers to questions</p> <p>Use experiences of the world around them to suggest appropriate answers to questions. With support, relate these to evidence e.g. observations made, measurements taken or information gained from secondary sources. Recognise 'biggest and smallest', 'best and worst' etc. from their data.</p>	<p>Using their observations and ideas to suggest answers to questions</p> <p>Use experiences of the world around them to suggest appropriate answers to questions. With support, relate these to evidence e.g. observations made, measurements taken or information gained from secondary sources. The children recognise 'biggest and smallest', 'best and worst' etc. from their data.</p>	<p>Identifying differences, similarities or changes related to simple scientific ideas and processes</p> <p>Interpret data to generate simple comparative statements based on evidence. Begin to identify naturally occurring patterns.</p>	<p>Identifying differences, similarities or changes related to simple scientific ideas and processes</p> <p>Interpret data to generate simple comparative statements based on evidence. Begin to identify naturally occurring patterns and causal relationships.</p>	<p>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</p> <p>In conclusions; identify causal relationships and patterns in the natural world from evidence; identify results that do not fit the overall pattern; explain findings using subject knowledge. Evaluate, for example, the choice of method used, the control of variables, the precision and accuracy of measurements and the credibility of secondary sources used. Identify any limitations that reduce the trust they have in their data.</p>	<p>gathered. Talk about how new discoveries change scientific understanding.</p> <p>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</p> <p>In conclusions; identify causal relationships and patterns in the natural world from evidence; identify results that do not fit the overall pattern; explain findings using subject knowledge. Evaluate, for example, the choice of method used, the control of variables, the precision and accuracy of measurements and the credibility of secondary sources used. Identify any limitations that reduce the trust they have in their data.</p>
		<p>Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions</p> <p>Draw conclusions based on their evidence and current subject knowledge. Identify ways in which they adapted their method as they progressed or how they would do it differently if they repeated the enquiry. Use evidence to suggest values for different items tested using the same method e.g. the distance travelled by a car on an additional surface.</p>	<p>Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions</p> <p>They draw conclusions based on their evidence and current subject knowledge. Identify ways in which they adapted their method as they progressed or how they would do it differently if they repeated the enquiry Use evidence to suggest values for different items tested using the same method e.g. the distance travelled by a car on an additional surface. Following a scientific experience, ask further questions which can be answered by extending the same enquiry.</p>	<p>Using test results to make predictions to set up further comparative and fair tests</p> <p>Use the scientific knowledge gained from enquiry work to make predictions they can investigate using comparative and fair tests.</p>	<p>Using test results to make predictions to set up further comparative and fair tests</p> <p>Use the scientific knowledge gained from enquiry work to make predictions they can investigate using comparative and fair tests.</p>
		<p>Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions</p> <p>Communicate their findings to an audience both orally and in writing, using appropriate scientific vocabulary.</p>	<p>Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions</p> <p>Communicate their findings to an audience both orally and in writing, using appropriate scientific vocabulary.</p>	<p>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</p> <p>Communicate their findings to an audience using relevant scientific language and illustrations.</p>	<p>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</p> <p>Communicate their findings to an audience using relevant scientific language and illustrations.</p>