

# Science

## Science in EYFS: Understanding the World

**Educational Programme:** 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 – from visiting parks, libraries and museums to meeting important members of society such as police officers, nurses and firefighters. In addition, listening to a broad selection of stories, non-fiction, rhymes and poems will foster their understanding of our culturally, socially, technologically and ecologically diverse world. As well as building important knowledge, this extends their familiarity with words that support understanding across domains. Enriching and widening children’s vocabulary will support later reading comprehension.

**After a year in the EYFS classroom we would like children to move into the KS1 curriculum having the knowledge, skills and concepts...**

- To observe and comment on differences in the seasons and weather in Hawkesbury and compare to other hot and cold parts of the world
- To explore a range of materials and states of being and say how they change overtime and in different conditions e.g. ice
- To know how plants and animals change over time and understand what they need to grow
- To explore and talk about different forces
- To talk about the Earth, sun, moon, planets and stars

## Science in KS1 and KS2

All enquiries are taught on a two-year cycle. Year A starts in the September of an even year (e.g. 2022, 2024 etc.). Year B starts in the September in an odd year (2023, 2025 etc.).

Our enquiries for science and the enquiry question is in the left column and the Science national curriculum content for each enquiry is in the right column. Working scientifically runs through all the scientist enquiries.

### KS1 (YEARS 1 AND 2)

YEAR A OF THE TWO-YEAR CYCLE	
ENQUIRY	NATIONAL CURRICULUM CONTENT
Term 1 What is home?	<b>Living things and their habitats</b> - explore and compare the differences between things that are living, dead and things that have never been alive; - 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; - identify and name a variety of plants and animals in their habitats, including micro-habitats. <b>Animals, including humans</b>

	<p>- notice that animals, including humans, have offspring which grow into adults</p> <p><b>Working Scientifically</b></p> <p>-asking simple questions and recognising that they can be answered in different ways</p>
<p>Term 1</p> <p>How are schools the same?</p>	<p><b>Working Scientifically</b></p> <p>-asking simple questions</p>
<p>Term 3</p> <p>What did Brunel do for Great Britain?</p>	<p><b>Working Scientifically:</b></p> <p>-Performing simple tests</p>
<p>Term 4</p> <p>How do we live a healthy life?</p>	<p><b>Living things and their habitats</b></p> <p>- 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.</p> <p><b>Animals, including humans</b></p> <p>- find out about &amp; 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><b>Working Scientifically</b></p> <p>-Performing simple tests</p>
<p>Term 4</p> <p>How do plants grow near me?</p>	<p><b>Plants</b></p> <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>-Performing simple tests</p>
<p>Term 5</p> <p>How will we get around in the future?</p>	<p><b>Working Scientifically</b></p> <p>-Using observations and ideas to answer questions</p>
<p>Term 6</p> <p>What could my classroom be made of?</p>	<p><b>Everyday Materials</b></p> <p>- identify and compare the suitability for particular uses, of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard;</p> <p>-find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.</p> <p><b>Working Scientifically:</b></p> <p>-Identifying and classifying</p> <p>-Gathering and recording data to answer questions</p>

YEAR B OF THE TWO-YEAR CYCLE	
ENQUIRY	NATIONAL CURRICULUM CONTENT
<p>Term 1</p> <p>What grows near me?</p>	<p><b>Plants:</b></p> <p>- identify and name a variety of common wild and garden plants;</p> <p>- identify and describe the basic structure of a variety of common</p> <p>- flowering plants, including trees</p> <p><b>Working Scientifically:</b></p> <p>-Performing simple tests</p> <p>-Use observations and ideas to suggest answers to questions</p>

Term 2 How do we move around?	<b>Working Scientifically:</b> -Asking simple questions -Perform simple tests
Term 3 Where is my school?	<b>Working Scientifically:</b> - Gathering and recording data Using observations and ideas to answer questions
Term 4 What might I do in the future?	<b>Working Scientifically</b> - Gathering and recording data -Identifying and classifying
Term 6 What am I?	<b>Animals, including humans:</b> - identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals; - identify and name a variety of common animals that are carnivores, herbivores and omnivores; - describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals including pets); - identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. <b>Working Scientifically:</b> -Identifying and classifying -Using observations to answer questions -Observing closely using simple equipment
Term 6 What could my hat be made of?	<b>Everyday Materials:</b> - distinguish between an object and the material from which it is made; - identify and name a variety of everyday materials, including wood, plastic, glass, metal, water and rock; - describe the simple physical properties of a variety of everyday materials; - compare and group together a variety of everyday materials based on their simple physical properties. <b>Working Scientifically:</b> -Identifying and classifying

### KS2 (YEARS 3 AND 4)

YEAR A OF THE TWO-YEAR CYCLE	
ENQUIRY	NATIONAL CURRICULUM CONTENT
Term 2 How can we switch off?	<b>Electricity</b> - identify common appliances that run on electricity; - construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers; - 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; - recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit; - recognise some common conductors and insulators, and associate metals with being good conductors.

	<p><b>Working Scientifically</b></p> <ul style="list-style-type: none"> <li>- recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables.</li> </ul>
<p>Term 3 What is sound?</p>	<p><b>Sound</b></p> <ul style="list-style-type: none"> <li>- identify how sounds are made, associating some of them with something vibrating;</li> <li>- recognise that vibrations from sounds travel through a medium to the ear;</li> <li>- find patterns between the pitch of a sound and features of the object that produced it;</li> <li>- find patterns between the volume of a sound and the strength of the vibrations that produced it;</li> <li>- recognise that sounds get fainter as the distance from the sound source increases.</li> </ul> <p><b>Working Scientifically</b></p> <ul style="list-style-type: none"> <li>- setting up simple practical enquiries, comparative and fair tests.</li> <li>- using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.</li> </ul>
<p>Term 4 Why are more people becoming vegetarian?</p>	<p><b>Animals, including humans</b></p> <ul style="list-style-type: none"> <li>- describe the simple functions of the basic parts of the digestive system in humans;</li> <li>- identify the different types of teeth in humans and their simple functions;</li> <li>- construct and interpret a variety of food chains, identifying producers, predators and prey.</li> </ul> <p><b>Working Scientifically</b></p> <ul style="list-style-type: none"> <li>- identifying differences, similarities or changes related to simple scientific ideas and processes</li> </ul>
<p>Term 6 Where does our water come from?</p>	<p><b>States of matter</b></p> <ul style="list-style-type: none"> <li>- compare and group materials together, according to whether they are solids, liquids or gases;</li> <li>- 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);</li> <li>- identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.</li> </ul> <p><b>Working Scientifically</b></p> <ul style="list-style-type: none"> <li>- asking relevant questions and using different types of scientific enquiries to answer them.</li> <li>- setting up simple practical enquiries, comparative and fair tests.</li> </ul>
<p>Term 6 What should we flush down the loo?</p>	<p><b>Living things and their habitats</b></p> <ul style="list-style-type: none"> <li>- recognise that living things can be grouped in a variety of ways;</li> <li>- explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment;</li> <li>- recognise that environments can change and that this can sometimes pose dangers to living things.</li> </ul> <p><b>Working Scientifically</b></p> <ul style="list-style-type: none"> <li>- using straightforward scientific evidence to answer questions or to support their findings.</li> </ul>

YEAR B OF THE TWO-YEAR CYCLE

ENQUIRY	NATIONAL CURRICULUM CONTENT
<p>Term 1 How can you feel force?</p>	<p><b>Forces and magnets</b></p> <ul style="list-style-type: none"> <li>- compare how things move on different surfaces;</li> <li>- notice that some forces need contact between two objects, but magnetic forces can act at a distance;</li> <li>- observe how magnets attract or repel each other and attract some materials and not others;</li> <li>- compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials;</li> <li>- describe magnets as having two poles;</li> <li>- predict whether two magnets will attract or repel each other, depending on which poles are facing.</li> </ul> <p><b>Working Scientifically</b></p> <ul style="list-style-type: none"> <li>- setting up simple practical enquiries, comparative and fair tests.</li> <li>- using straightforward scientific evidence to answer or to support their findings</li> </ul>
<p>Term 2 What is underneath our feet?</p>	<p><b>Rocks</b></p> <ul style="list-style-type: none"> <li>- compare and group together different kinds of rocks on the basis of their appearance and simple physical properties;</li> <li>- describe in simple terms how fossils are formed (when things that have lived are trapped within rock);</li> <li>- recognise that soils are made from rocks and organic matter.</li> </ul> <p><b>Working Scientifically</b></p> <ul style="list-style-type: none"> <li>- recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables.</li> <li>- reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.</li> </ul>
<p>Term 4 What is the difference between surviving and being healthy?</p>	<p><b>Animals, including humans</b></p> <ul style="list-style-type: none"> <li>- 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;</li> <li>- identify that humans and some other animals have skeletons and muscles for support, protection and movement.</li> </ul> <p><b>Working Scientifically</b></p> <ul style="list-style-type: none"> <li>-identifying difference, similarities or changes related to simple scientific ideas and processes.</li> <li>-using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.</li> </ul>
<p>Term 5 How do plants die?</p>	<p><b>Plants</b></p> <ul style="list-style-type: none"> <li>- identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers;</li> <li>- 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;</li> <li>- investigate the way in which water is transported within plants;</li> <li>- explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.</li> </ul> <p><b>Working Scientifically</b></p> <ul style="list-style-type: none"> <li>-making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers</li> </ul>
<p>Term 6</p>	<p><b>Light</b></p>

<p>Where does the darkness come from?</p>	<ul style="list-style-type: none"> <li>- recognise that they need light in order to see things and that dark is the absence of light;</li> <li>- notice that light is reflected from surfaces;</li> <li>- recognise that light from the sun can be dangerous and that there are ways to protect their eyes;</li> <li>- recognise that shadows are formed when the light from a light source is blocked by an opaque object;</li> <li>- find patterns in the way that the size of shadows change.</li> </ul> <p><b>Working Scientifically</b></p> <ul style="list-style-type: none"> <li>-gathering, recording, classifying and presenting data in a variety of ways to help in answering questions.</li> </ul>
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### KS2 (YEARS 5 AND 6)

YEAR A OF THE TWO-YEAR CYCLE	
ENQUIRY	NATIONAL CURRICULUM CONTENT
<p>Term 1</p> <p>What does the Earth look like from the solar system?</p>	<p><b>Earth and Space</b></p> <ul style="list-style-type: none"> <li>- describe the movement of the Earth and other planets relative to the Sun in the Solar System;</li> <li>- describe the movement of the Moon relative to the Earth;</li> <li>- describe the Sun, Earth and Moon as approximately spherical bodies;</li> <li>- use the idea of the Earth’s rotation to explain day and night and the apparent movement of the Sun across the sky.</li> </ul> <p><b>Working Scientifically</b></p> <ul style="list-style-type: none"> <li>- using test results to make predictions to set up further comparative and fair tests</li> <li>- reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of results, in oral and written forms such as displays and other presentations.</li> </ul>
<p>Term 2</p> <p>How are you helping to save the planet?</p>	<p><b>Living things and their habitats</b></p> <ul style="list-style-type: none"> <li>- describe the differences in life cycles of a mammal, amphibian, an insect and a bird;</li> <li>- describe the life process of reproduction in some plants and animals.</li> </ul> <p><b>Working Scientifically</b></p> <ul style="list-style-type: none"> <li>- identifying scientific evidence that has been used to support or refute ideas or arguments.</li> </ul>
<p>Term 3</p> <p>How can science help the homeless?</p>	<p><b>Properties and changes of materials:</b></p> <ul style="list-style-type: none"> <li>- 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;</li> <li>- know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution;</li> <li>- use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating;</li> <li>- give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic;</li> <li>- demonstrate that dissolving, mixing and changes of state are reversible changes;</li> </ul>

	<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><b>Working Scientifically</b></p> <ul style="list-style-type: none"> <li>- recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, and bar and line graphs.</li> <li>- using test results to make predictions to set up further comparative and fair tests</li> </ul>
<p><b>Term 3</b> What do forces actually do?</p>	<p><b>Forces</b></p> <ul style="list-style-type: none"> <li>- explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object</li> <li>- identify the effects of air resistance, water resistance and friction, that act between moving surfaces</li> <li>- recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect</li> </ul> <p><b>Working Scientifically</b></p> <ul style="list-style-type: none"> <li>- planning different types of scientific enquiries to answer questions, including recognising and controlling variable where necessary.</li> <li>- taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings where appropriate.</li> </ul>
<p><b>Term 4</b> Where is our twin?</p>	<p><b>Working Scientifically</b></p> <ul style="list-style-type: none"> <li>- Interpreting data</li> </ul>
<p><b>Term 5</b> How can we show what we believe in?</p>	<p><b>Working Scientifically</b></p> <ul style="list-style-type: none"> <li>- Scientific evidence</li> </ul>

YEAR B OF THE TWO-YEAR CYCLE	
ENQUIRY	NATIONAL CURRICULUM CONTENT
<p><b>Term 2</b> How are lives saved?</p>	<p><b>Animals including humans:</b></p> <ul style="list-style-type: none"> <li>- identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood;</li> <li>- recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function;</li> <li>- describe the ways in which nutrients and water are transported within animals, including humans.</li> </ul> <p><b>Working scientifically</b></p> <ul style="list-style-type: none"> <li>- identifying scientific evidence that has been used to support or refute ideas or arguments;</li> <li>- understanding who the leading figures in scientific thought are and what they have achieved (locally if possible).</li> </ul>
<p><b>Term 3</b> Linnaeus or Darwin – how are they connected?</p>	<p><b>Living things and their habitats</b></p> <ul style="list-style-type: none"> <li>- describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals;</li> <li>- give reasons for classifying plants and animals based on specific characteristics.</li> </ul> <p><b>Evolution and inheritance</b></p>

	<ul style="list-style-type: none"> <li>- recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago;</li> <li>- recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents;</li> <li>- identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.</li> </ul> <p><b>Working Scientifically</b></p> <ul style="list-style-type: none"> <li>- identifying scientific evidence that has been used to support or refute ideas or arguments.</li> </ul>
<p>Term 5 Why are shadows important?</p>	<p><b>Light:</b></p> <ul style="list-style-type: none"> <li>- recognise that light appears to travel in straight lines;</li> <li>- 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;</li> <li>- 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;</li> <li>- use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.</li> </ul> <p><b>Working Scientifically</b></p> <ul style="list-style-type: none"> <li>- planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary</li> <li>- use test results to make predictions to set up further comparative and fair tests</li> </ul>
<p>Term 5 What is your carbon footprint?</p>	<p><b>Electricity:</b></p> <ul style="list-style-type: none"> <li>- associate the brightness of a lamp [please refer to National Curriculum for full statement]</li> <li>- compare and give reasons for variations in how components function [please refer to National Curriculum for full statement]</li> <li>- use recognised symbols when representing a simple circuit in a diagram</li> </ul> <p><b>Working Scientifically</b></p> <ul style="list-style-type: none"> <li>- Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of results, in oral and written forms such as displays and other presentations.</li> </ul>