



## Highfield Long Term Plan: Science



Year 5 pond dipping



Year 3 light



Alwoodley Climate Action visiting our School Council

'SCIENCE IS MAGIC THAT WORKS'.

Kurt Vonnegut



## Highfield Long Term Plan: Science

### Highfield Vision for Science

At Highfield our Science curriculum is all about developing the children's knowledge and understanding of the world in which we live and furthering their curiosity through investigation and questioning. From plants, animals, habitats and materials in Key Stage One, to magnetism, electricity, space and evolution in Key Stage Two, we cover a wide breadth of study for all our year groups. We place an importance on learning and using scientific vocabulary as well as encouraging children to think about how science relates to their everyday lives.

We follow The National Curriculum programmes of study for each year group supported by the Developing Experts learning approach. The Developing Experts™ learning approach is underpinned by three questions:

*'What does a government need to grow its economy over the next 20-50 years?'*

*'What does the workforce need to look like to serve the economy a government seeks to grow?'*

*'What does the education system need to look like to realise this goal?'*

These questions align perfectly with the Highfield Curriculum intent, which aims 'To prepare children for the opportunities and challenges of the 21st Century' by meeting the 'demands of our community and of global citizenship'.

Science is delivered, wherever possible, as practical, hands-on lessons that ensure the children are fully immersed in their learning and discovery. We are fortunate to have wonderful grounds with a pond, lots of trees and an allotment. These are accessed by all year groups where appropriate to support our science learning. Working scientifically forms the basis to all our science lessons and the children are taught to use the following practical scientific methods, processes and skills:

- observation over time
- identifying and classifying
- pattern seeking
- researching
- comparative and fair testing








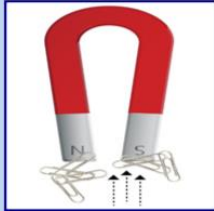


# Highfield Long Term Plan: Science

## Scientific Knowledge

The key knowledge covered and its progression through year groups is detailed in the 'Highfield Science Progression of Knowledge' document. It is delivered through a sequenced curriculum designed by Developing Experts 'to enable the learner to experience a coherent curriculum delivered through a logical progression'. This includes carefully ordering the sequence in which knowledge is delivered, built on and revisited. The carefully sequenced science units 'provide a vehicle for teachers to embellish and unify what may otherwise seem like disconnected fragments of knowledge'. The Highfield Science Curriculum also incorporates topics such as climate change, sustainability and other relevant global issues into the science curriculum which is essential for preparing children for life in a global society. We believe that science education plays a crucial role in fostering awareness, understanding, and engagement with complex global challenges, empowering students to become informed citizens and responsible stewards of the planet. All the topics covered are also detailed in the 'Scientific Concept, National Curriculum Objective and Topic Year Group Map' below.

## Scientific Concepts

We use concepts (big ideas) in science to support learning because they play a vital role in committing knowledge to long-term memory by providing a structured framework that helps organize, connect, and make sense of information. By mastering scientific concepts and developing a strong conceptual understanding, learners can build a robust and interconnected knowledge base that supports lifelong learning, critical thinking, and informed decision-making in various scientific disciplines and contexts. Scientific concepts provide our pupils with a solid foundation for more advanced scientific studies in high school and beyond. To further support our pupils in their preparation for Key Stage 3, our concepts are organised into the three fundamental branches of science that contribute to our understanding of the natural world: biology, physics, and chemistry. The key concepts we use in science are:

							
<b>Animals including humans</b>	<b>Plants</b>	<b>Living things and their habitats</b>	<b>Materials</b>	<b>States of matter</b>	<b>Forces</b>	<b>Energy</b>	<b>Earth Science</b>
<b>Biology</b>			<b>Chemistry</b>		<b>Physics</b>		



# Highfield Long Term Plan: Science

## Scientific Skills

Scientific enquiry skills at Highfield Primary School are foundational abilities that our pupils develop to explore, understand, and engage with the natural world in a systematic and enquiry-based manner. Enquiry skills are often integrated into hands-on activities, exploratory learning experiences, and interdisciplinary approaches that connect science with other subjects like mathematics and the arts. By engaging in these activities and developing enquiry skills, Highfield pupils build a solid foundation for understanding scientific concepts, fostering a lifelong love of learning, and preparing for future scientific exploration and discovery. These skills lay the groundwork for more advanced scientific learning in later stages of education. The key scientific enquiry skills we use are:



**Questioning**



**Predicting**



**Fair testing**



**Observing and measuring**



**Recording, evaluating and interpreting**










**Research using secondary sources**



**Classifying and grouping**

The enquiry skills were developed using guidance from the Primary Science Teaching Trust and can be defined as:

 Asking questions that can be answered using a scientific enquiry.	 Using tables, drawings and other means to note observations and measurements then draw conclusions by interpreting the information.
 Using prior knowledge to suggest what will happen in an enquiry.	 Using secondary sources of information to answer scientific questions.
 Deciding on the method and equipment to use to carry out a fair test.	 Making observations to name, sort and organise items.
 Using senses and measuring equipment to make observations about the enquiry.	

All skill progression is mapped out along with the scientific concepts in the 'Highfield Science Progression of Skills' document.



# Highfield Long Term Plan: Science

## Assessment

Why do we Assess?

Assessment in science helps us to understand and track our progress. It is important because it shows what we have learned and what we still need to work on. There are different types of assessments that help us in different ways.

### Pre and Post Topic Assessments

Before starting learning about a new science unit, children do a pre-topic assessment. This is an activity that helps the teacher understand what the children already know about the topic and links to previous topics, scientific knowledge, concepts and skills. This allows the teacher to be responsive to the pupils' needs when planning the learning. After the children have finished learning a science unit, they do a post-topic assessment. This is another activity that helps the children and the teacher see how much the pupils have learned. The Developing Experts™ learning approach includes unit assessments. However this is not the only method of assessing understanding that we use at Highfield, for example, opportunities for retrieval are given to elicit previous learning before lessons.

### Formative Assessment

During the teaching of science, the teacher continually formatively assesses pupils' learning. Formative assessment is the day-to-day ongoing assessment, sometimes referred to as assessment for learning. This forms a detailed picture of children's knowledge and understanding against specific learning outcomes. Most simply, it means providing teaching that is adaptive to pupils' needs and using evidence about learning to adjust instruction to ensure that learning moves forward. This means they are checking on how children are doing while they are learning. It is responsive and feedback given in the moment.

### Summative Assessment

In-school Summative Assessment provides information on a child's achievements over time. These assessments allow teachers and Senior Leaders to monitor the performance and progress of pupils over time. They help to monitor pupil cohorts / vulnerable groups and identify where interventions may be required to ensure pupils make progress. At Highfield, whole school Science summative assessments are carried out bi-annually: once at the end of the Autumn Term and then again in the Summer Term.

### Science Assessment Calendar:

- Bi-annual data submission of Science attainment (November and May)
- Termly Audit of the Science Curriculum coverage
- January & July: Subject scrutiny and monitoring of action plan (including pupil voice)
- Pre and post topic assessment





## Highfield Long Term Plan: Science

### Enrichment

Enrichment experiences play a crucial role in helping children learn abstract concepts by providing them with opportunities to explore, engage, and make connections between theoretical knowledge and real-world applications. For this reason 'Enrichment' is one of the four key drivers of the Highfield Curriculum. The 'Wider Curriculum' or 'Enrichment opportunities' are mapped out in the Enrichment mapping across the curriculum document.

At Highfield, learning in science is enriched by the following experiences:

Reception - farm and Newby Hall (minibeast hunt at Newby hall)

Year 1 – a visit from paramedic who works with the Yorkshire Air Ambulance

Year 2 – a visit from a dental hygienist

Year 3 – a visit to tropical world to learn more about the life cycles of butterflies


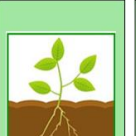









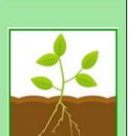








Year 4 – a visit from a rainforest explorer

Year 5 – a visit to Bradford Media museum for our Space topic and Nell Bank for pond dipping.





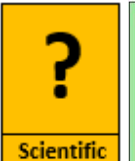








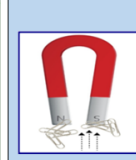




Year 6 – a visit from two engineers who design prosthetics (both male and female role models)

Enrichment experiences in science at Highfield are instrumental in nurturing our pupils' curiosity, deepening their understanding, and developing essential skills and attitudes that will serve them well throughout their academic journey and beyond. By providing a rich and engaging learning environment, we can inspire the next generation of scientists, innovators, and critical thinkers.

# Highfield Long Term Plan: Science

Scientific Concept, National Curriculum Objective and Topic Year Group Map		Autumn	Spring	Summer
EYFS	Scientific Concept	 Animals including humans  Plants  Living things and their habitats  Materials  Forces  Earth Science		
	National Curriculum Objective & Topic	<p>In EYFS pupils are taught Science through the strand Understanding the World.</p> <p>Throughout the year pupils will be taught strands:</p> <p><b>Animals including humans, Living things and their habitats, Plants, Materials, Forces and Earth Science</b></p>		
Year 1	Scientific Concept	 Animals including humans  Earth Science	 Materials  Animals including humans  Earth Science	 Plants  Materials  Earth Science
	National Curriculum Objective & Topic	<ul style="list-style-type: none"> <li>Animals Including humans 1 – All about me</li> <li>Seasonal changes - Autumn</li> </ul>	<ul style="list-style-type: none"> <li>Everyday material 1 – Exploring everyday materials</li> <li>Animals including humans 2 – All about animals</li> <li>Seasonal changes – Winter and Spring</li> </ul>	<ul style="list-style-type: none"> <li>Plants</li> <li>Everyday materials 2 - Building unit</li> <li>Seasonal changes - Summer</li> </ul>
Year 2	Scientific Concept	 Animals including humans  Living things and their habitats	 Materials  Animals including humans	 Plants  Living things and their habitats
	National Curriculum Objective & Topic	<ul style="list-style-type: none"> <li>Animals including humans 1 – Growth</li> <li>Living things and their habitats</li> </ul>	<ul style="list-style-type: none"> <li>Uses of everyday materials</li> <li>Animals including humans 2 – Life cycles</li> </ul>	<ul style="list-style-type: none"> <li>Plants</li> <li>Living things and their habitats – Habitats around the world</li> </ul>







# Highfield Long Term Plan: Science

Year 3	Scientific Concept	 Forces  Energy	 Plants  Materials	 Scientific enquiry  Animals including humans
	National Curriculum Objective & Topic	<ul style="list-style-type: none"> <li>Forces and magnets</li> <li>Light</li> </ul>	<ul style="list-style-type: none"> <li>Plants</li> <li>Rocks</li> </ul>	<ul style="list-style-type: none"> <li>Scientific enquiry unit</li> <li>Animals including humans</li> </ul>
Year 4	Scientific Concept	 States of matter  Energy	 Energy  Living things and their habitats	 Animals including humans  Living things and their habitats
	National Curriculum Objective & Topic	<ul style="list-style-type: none"> <li>States of matter</li> <li>Electricity</li> </ul>	<ul style="list-style-type: none"> <li>Sound</li> <li>Animals including humans</li> </ul>	<ul style="list-style-type: none"> <li>Animals including humans</li> <li>Living things and their habitats - conservation</li> </ul>
Year 5	Scientific Concept	 Living things and their habitats  Forces	 Materials  Materials	 Earth Science  Animals including humans
	National Curriculum Objective & Topic	<ul style="list-style-type: none"> <li>Living things and their habitats</li> <li>Forces</li> </ul>	<ul style="list-style-type: none"> <li>Changes of materials</li> <li>Properties of materials</li> </ul>	<ul style="list-style-type: none"> <li>Earth and Space</li> <li>Animals including humans</li> </ul>





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<b>Year 6</b>	<b>Scientific Concept</b>	 <p>Animals including humans</p>	 <p>Energy</p>	 <p>Animals including humans</p>	 <p>Living things and their habitats</p>	 <p>Energy</p>	 <p>Earth Science</p>
	<b>National Curriculum Objective &amp; Topic</b>	<ul style="list-style-type: none"> <li>▪ Animals including humans</li> <li>▪ Electricity</li> </ul>		<ul style="list-style-type: none"> <li>▪ Evolution and inheritance</li> <li>▪ Living things and their habitats</li> </ul>		<ul style="list-style-type: none"> <li>▪ Light</li> <li>▪ Looking after our environment</li> </ul>	