

Science Curriculum Statement

Vision for science at Foxhills



For every child to master working scientifically, so that it fosters their curiosity and encourages a sense of wonder across all three of the science domains.

Science is a subject that supports children's understanding of the natural world by creating links and making connections in order for them to understand why things occur. The science curriculum at Foxhills, has been tailored to develop a sense of excitement and curiosity about natural phenomena. All scientists at Foxhills understand that the discipline is a dynamic and engaging process designed to foster curiosity, critical thinking and scientific enquiry; that ultimately supports them to develop a unique perspective about the world in which they live.

Our curriculum has been carefully crafted to introduce young learners to scientific concepts through a combination of hands on experiences, exploration and support to make meaningful links between substantive and disciplinary knowledge.

Foxhills scientists are encouraged to reason scientifically with increasing sophistication and are supported to use their knowledge to work scientifically with increasing expertise. This is achieved through the use of observation, recording, questioning, and ultimately drawing conclusions.



Sequencing of the science Curriculum

How is the science curriculum organised?

The Foxhills Junior School Science curriculum has been developed in partnership with Foxhills Infant School to ensure that children's experience of the Science curriculum remains coherent as they transition between infant and junior education. The children revisit each scientific domain each year building on their previous knowledge. The children increase their working scientifically skills in each domain as they progress through the year groups.

Year 3

Children will begin year 3 by learning about animals, skeletons and their movement focusing on nutrition, bones and muscles. This allows continuity from summer 2, year 2 when they learnt about how to keep their bodies healthy. Autumn 2 introduces new working scientific skills which children apply to their learning about magnets. This is the first topic in the physics domain for them. The children have two half terms to develop this learning and embed their skills. In spring 2 children continue their physics learning by applying their knowledge to light. This learning prepares the children for the importance of light in plant production which they will cover in summer 2. Summer 1 will also prepare the children for this topic when learning about rocks and soil. In summer 2 children will consolidate their learning from previous year groups and develop new knowledge on plants and their food production. This needs to be completed in summer 2 so that children are able to see the plants growing.

Year 4

Revisiting and building on from prior knowledge in year 2 and year 3, children will develop their understanding of food chains. Children will also be introduced to the human digestive system. In Autumn 2 children will learn about states of matter. This exposes them to the terms condensation and evaporation which will prepare them for their learning about the water cycle in spring 2 geography. In spring 1 children will be introduced to sound for the first

	<p>time since learning in year R. It is also a year since children have done any physics learning. The children will then continue their physics learning into spring 2 and summer 1. Children do this over two half terms to allow them time to build their new knowledge and learn to use their previous working scientifically skills safely in the classroom. Children finish year 4 by learning about living things and their habitats because it is a good time of year for them to be able to go out and explore their local environment. They have also witnessed the changes of the environment over the whole year at this point.</p> <p><u>Year 5</u> Children will begin year 5 with their chemistry learning as they have not looked at this domain since autumn 2 year 4. The learning will build on their knowledge of materials from year 1 and 2, by looking at how materials can change. In the spring term the children will begin their physics learning, they will begin that learning by looking at forces. The children need to learn this knowledge about forces before they learn about earth and space in spring 2. This will help with their understanding of earth and space. For the summer term children will complete their biological learning journey to finish the year. In summer one they will be learning about living things and their habitats. This will build on from the learning that they did at the end of year 4 and having it a year later will be good practise of retrieval for them. In summer 2 their biology learning will be about animals including humans (changes in age). This will include talk about puberty which will prepare them for year 6.</p> <p><u>Year 6</u> Children will start the year with their biology learning journey, which will begin with learning about living things in autumn 1. This follows on from the learning the children did in summer 1 of year 5. In the learning journey the children will learn about classification. This will support their evolution and inheritance learning which they will complete in autumn 2. Going into the spring term the children will complete their physics learning journey which builds on lots of their previous knowledge and gives the children a good opportunity for retrieval of their physics knowledge. In spring 1 the children will build on their learning about electricity from year 4. Spring 2 will focus on light which builds on from learning they did in year 3. For the whole summer term, the children will go back to their biology learning journey and will be looking at animals including humans again, but this time the focus will be on circulation and healthy bodies. It will be good for children to complete this topic in their final term at school to give them a good awareness of themselves and how to keep healthy because at secondary school they will have to make more choices themselves.</p>
<p>What are the knowledge types and how will they be taught?</p>	<p>The curriculum at Foxhills is knowledge-based because our staff are united by the belief that knowledge promotes intellectual growth: The more you know, the more you understand the world. Knowledgeable children are confident and can broaden their experiences.</p> <p>The knowledge in our Science curriculum has been split into two different knowledge types. Substantive knowledge (knowing that...) and disciplinary knowledge (knowing how...).</p> <p>Substantive knowledge is comprised of established facts. Children are taught these facts and are taught this knowledge through highly effective teacher modelling. This knowledge is presented to children in different ways and is reinforced through the use of knowledge organisers, and questioning.</p> <p>Disciplinary knowledge refers to the method of working, in this case scientific enquiry. Teachers demonstrate to children the different methods of scientific enquiry that they can carry out to answer scientific questions. To begin with children will be supported to carry out scientific enquires but will eventually be able to complete these independently. This way of working fosters children curiosity.</p>
<p>How is the curriculum implemented?</p>	<p>When delivering the science curriculum to our children, teachers consider both pedagogical knowledge and pedagogical content knowledge. Pedagogical content knowledge refers to the link between what the children need to know (our knowledge) and how to teach it; knowledge of pedagogy, knowledge of pupils and teacher attitudes and beliefs (relationships, accountability and commitment). When considering pedagogical knowledge, teachers think about the best ways for the subject to be taught and delivered (based on our disciplinary understanding).</p> <p>At Foxhills we believe that the most effective way to implement our science curriculum is by fostering children's curiosity. All science learning journeys at Foxhills begin with a big question which is used to hook the children in to the learning. The children will then be encouraged to use different methods of scientific enquiry, research and questioning to work out how to answer the big question. Teachers will share high quality models of work and methods to give them the opportunity to become scientists.</p> <p>In science lessons curiosity is fostered through the use of effective questioning by teachers/TAs and the children themselves. The adults will be constantly encouraging children to explore their environment and the world. Teachers will revisit relevant knowledge, prior to teaching new knowledge which enables children to hang their new knowledge onto that which they already know and understand, therefore making links explicitly clear, enabling knowledge webs to develop.</p>

	<p>For learning to take place, there must be a change in a child's long-term memory, therefore it is essential that once learned, the most crucial content is revisited. This is why the curriculum is recursive and children revisit the different domains throughout the years they are at foxhills.</p>
<p>Adaption and variation</p>	<p>Some of the typical barriers in science learning is:</p> <ul style="list-style-type: none"> • Literacy/language skills – being able to access resources and record • Numeracy skills understanding of how results need to be processed • Preconceived notions • Non-scientific beliefs (religion) (i.e. history of Earth and life forms) • Conceptual misunderstandings • Vernacular misconceptions (scientific words having a different meaning to those used in everyday life) • Factual misconceptions <p>At Foxhills Infant School we believe that science is inclusive and fosters curiosity in all children. Lessons will be tailored so that all children are exposed to the science learning domains and are able to participate in science enquires. Therefore, teachers set suitable learning challenges in response to children's diverse learning needs, overcoming potential barriers, to enable all children to meet the same objectives.</p> <p>The provision for SEND pupils is personalised in order for them to obtain the crucial knowledge to meet their milestones. In some cases, pre-teaching of key vocabulary and knowledge are carried out using a pre-learning journey, this can be with support from an additional adult. Misconceptions, spaced practise and retrieval opportunities are built into learning journeys to ensure pupils are supported in understanding key ideas, developing their long-term memory. As soon as children have grasped a concept then independence is promoted, allowing them to enjoy success as they achieve each step.</p> <p>The inclusive learning environment offers pupils the opportunity to demonstrate what they know, understand and can do, through multi-sensory approaches, including the use of ICT, 1-1 support or through peer support. Cutaway teaching provides an opportunity for children to experience varied modelling, based on their individual needs, and writing scaffolds, adapted knowledge organisers and other personalised resources ensure all children are able to acquire the same knowledge and keep up with the expectations of our ambitious curriculum.</p>
<p>Rationale for enrichment and wider personal development</p>	<p>In addition to the design of the science curriculum, leaders have sequentially mapped opportunities for enrichment and personal development beyond the expectations of the curriculum in science. Enrichment in science takes the form of visits from scientists, visits to science museums and opportunities for science experiments. These have been chosen and planned in a coherent way and they strengthen the school's science offer because they aim to increase engagement, whilst facilitating meaningful cross curricular links. This supports our aim to provide real and meaningful contexts for science.</p>
<p>Impact</p>	<p>Teachers check children's understanding of the science curriculum through the use of constant AfL during and between lessons. This enables teaching to be adapted and misconceptions to be addressed in real time. Pink feedback given to children acknowledges successes and explains why a child has been successful. Green feedback identifies where a child needs to improve. It is very specific and achievable in enabling the child to improve.</p> <p>The Science subject leader conducts book looks, triangulated with lesson observations and pupil conferencing in order to assess the extent in which all children are making progress in achieving our vision for science.</p>