

Developing an approach to teaching and learning in Science

A high-quality science education provides the foundations for understanding the world through the specific disciplines of biology, chemistry and physics. Science has changed our lives and is vital to the world's future prosperity, and all pupils should be taught essential aspects of the knowledge, methods, processes and uses of science. Through building up a body of key foundational knowledge and concepts, pupils should be encouraged to recognise the power of rational explanation and develop a sense of excitement and curiosity about natural phenomena. They should be encouraged to understand how science can be used to explain what is occurring, predict how things will behave, and analyse causes. NC 2014

School Vision:

Children will develop a sense of curiosity and excitement through practical child led enquiries. Science will be memorable and fuel a love of learning and discovery. Being immersed in nature through regular outdoor learning opportunities is an integral part of children having real life experiences of the world around them. They will see themselves as scientists, reflecting through regular investigations and explorations. They are encouraged to be confident in selecting which specific scientific skills they need to deploy in order to develop a deeper conceptual understanding of the world. Children will be independent in working scientifically by being given the opportunity to develop a good understanding of the nature, processes and methods of science. This will be made achievable through appropriately pitched language, varied types of enquiry, regular use of scientific skills and building on prior knowledge.

Intent

Children will be introduced to six different types of enquiry approaches that they may use to find out answers to investigable questions:

- comparative / fair testing
- research
- observation over time
- pattern seeking
- identifying, grouping and classifying
- problem solving

Our aim is that these stimulating and challenging experiences help children secure and extend their scientific knowledge, skills and vocabulary as well as promoting a love for learning and investigating. We believe that these opportunities will ensure that our children are confident, life-long learners who will explore the world around them, developing their ideas and ambitions which might lead to them following a career in a scientific area such as a forensic scientist, microbiologist or astronaut.

Implementation

At Wormley, Science is taught as a core subject within each year group in accordance with the National Curriculum and then enhanced by a range of extra activities such as

science week and experts visiting the school. Staff deliver high quality lessons and investigations, with a focus on working scientifically. Teacher's use ASE materials to support with planning.

Science is taught weekly, which allows each year group to build upon the learning from previous years through a sequence of carefully planned lessons developing both knowledge and scientific skills.

- Allowing time for children to explore, question, predict, plan, carry out investigations and observations as well as conclude their findings, by using their previous knowledge and gaining new skills throughout their learning journey.
- As the children progress through the school, they will learn to confidently present their findings and learning using science specific vocabulary, observations and diagrams, and to develop their resilience when their findings aren't necessarily what they expected to find.

In order to support children in their ability to 'know more and remember more' there are regular opportunities to review the learning taken place in previous topics as well as previous lessons.

- There are working walls in each classroom displaying key vocabulary and information to support the children with their acquisition of knowledge and these are used for pupils to refer to. Using science wheels in books/displays to identify and record science skills demonstrated.
- Effective use of education visits and visitors are planned, to enrich and enhance the pupil's learning experiences within the Science curriculum.
- Teachers use highly effective assessment for learning in each lesson to ensure misconceptions are highlighted and addressed.
- Each year group has a science book/reflective log to record examples of practical science learning and best practice in the science curriculum.
- Cross-curricular links are made during the planning process and within lessons, with other subjects such as Maths, English, computing and P.S.H.E.
- Hexagons are used pre and post assessment to inform understanding, prior knowledge and teach key vocabulary. End of unit assessment questions/quizzes are used to inform formative assessment on Arbor.

Impact

The impact of this curriculum design will lead to outstanding progress over time, across key stages, encompassing each child's starting point and learning journey. Through various investigations, enrichment opportunities, and interactions with experts, our science curriculum will lead pupils to be enthusiastic science learners and understand the impact that science has on their day-to-day lives, and the implications it has for their futures. Pupil Voice will show a progression of content knowledge, with appropriate vocabulary which supports and extends understanding. Children will be confident in discussing science using ambitious scientific vocabulary. Displays around school and books will show that there is a varied and engaging curriculum which

develops a range of scientific understanding and knowledge. A clear progression of knowledge is evident in line with expectations set out in the spiral curriculum. See below. Individuals' books and year group reflective logs showcase the process knowledge pupils have, over time, developed in working scientifically and the range of opportunities pupils have been given to apply their knowledge to practical experiences. The subject leader will collate appropriate evidence over time which evidence that pupils know more and remember more.

EYFS:

The Early Years Foundation Stage (EYFS) at Wormley Primary School is essential in establishing a child's scientific foundation, igniting a natural curiosity about the world and the scientific principles that govern it. With a focus on play-based and exploratory learning, EYFS introduces young minds to core scientific concepts, paving the way for continued inquiry throughout primary education.

Engaging in hands-on experiments, observing the natural environment, and exploring cause-and-effect relationships, EYFS nurtures critical skills such as observation, questioning, and problem-solving. These formative experiences lay the groundwork for more structured scientific investigations in later years.

As children transition from Wormley EYFS to Key Stage 1 (KS1) and Key Stage 2 (KS2), the knowledge acquired during their early years serves as a springboard for deeper scientific exploration. Fundamental concepts like the properties of materials, living organisms, and the basic principles of forces and motion, first introduced in EYFS, become integral components of more advanced scientific learning.

Wormley EYFS emphasises curiosity and experimentation, fostering a positive attitude toward scientific exploration. This environment encourages children to ask questions, make predictions, and seek answers—skills that are vital for their ongoing scientific education.

SEND:

Wormley School is dedicated to supporting children with Special Educational Needs and Disabilities (SEND) in their science development in alignment with the National Curriculum. The school implements a range of strategies and resources to create an inclusive learning environment.

Science lessons include a range of sensory and practical activities to engage students actively. These approaches help reinforce concepts and make learning more tangible for children with SEND.

The school fosters an inclusive atmosphere where diversity is celebrated. This culture encourages all students to participate actively in science lessons, promoting a sense of

belonging. Students are encouraged to participate in science learning through different creative ways such as using pupil voice, drawings and diagrams.

Year 1 Units:

Science	<p>We Are Living In A Material World <i>Everyday Materials</i></p>	<p>It's Good To Be Me <i>Animals, Including Humans</i></p>	<p>All Creatures Great And Small <i>Animals, Including Humans</i></p>
	<p>Gardener's World (Forest School activities across the year) <i>Plants</i> <i>Don't Blame It On The Weatherman</i> <i>Seasonal Changes</i></p>		

Year 2 Units:

Science	<p>Material World <i>Uses Of Everyday Materials</i></p>	<p>Greenfingers <i>Plants</i></p>	<p>Survival! What Do Animals And Humans Need? <i>Animals, including humans</i></p>
	<p>Who lives here? (Forest School activities across the year) <i>Living things and their habitats</i></p>		

Year 3:

Science	<p>People In Action <i>Animals, including humans</i></p>	<p>Light And Shadows Invisible Forces <i>Forces and magnets</i></p>	<p>Rocks, Soils and Fossils <i>Rocks</i> <i>Investigating Plants</i> <i>Plants</i></p>
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Year 4:

Science	<p>Good Vibrations <i>Sound</i> Making Lamps (link with DT project / English plan) <i>Circuits, buzzers and bulbs</i></p>	<p>The Digestion Journey <i>Animals, including humans (link with DT project)</i></p>	<p>The Scientific Key <i>Living Things and their habitats (link with geography)</i> <i>Solids, Liquids and Gases – The Water Cycle</i> <i>States of matter</i></p>
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Year 5:

Science	<p>Working scientifically <i>Which teabag produces the strongest tea?</i> <i>Know your materials</i> <i>Properties of materials</i></p>	<p>Going Into Space <i>Earth and Space</i> Speeding Up and Slowing Down <i>Forces</i></p>	<p>All change? <i>Properties and change of materials</i> <i>Life Cycles and Reproduction</i> <i>Living things and their habitats/Animals, including humans</i></p>
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Year 6:

Science	<p>Working Scientifically <i>Investigate which washing powder/liquid gets the cleanest results</i> Investigating Electrical Circuits (link with DT project) <i>Electricity</i></p>	<p>Investigating Light <i>Light</i> Staying Healthy <i>Animals, including humans</i></p>	<p>Operation Classify <i>Living things and their habitats</i> Why have giraffes got such long necks? (link with English text) <i>Evolution and inheritance</i></p>
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