Science at
Worth Valley Primary School

Why we teach Science at Worth Valley Primary School

At Worth Valley, we encourage a love of science and exploring by teaching lessons that inspire pupils to be engaged and inquisitive about the world around them. Pupils will gain knowledge and understanding about the world we live in and develop their skills in working scientifically by participating in experiments and investigations. Pupils will also enhance their scientific vocabulary, oracy skills and subject knowledge. This knowledge is built upon from EYFS through to Year 6.

The Curriculum is planned, using Developing Experts, to ensure that pupils can deepen and consolidate scientific concepts through experiencing different types of enquiry. These enquiries are planned to ensure that children learn the skills to work scientifically – these skills are developed and built upon throughout each year group. Careers and how elements of science can enhance future prospects are experienced through videos of specialists linked to their learning. It is our belief that all children should have the opportunity to enquire and investigate the world around them.

Our science curriculum is enhanced through external visits to Magna, Nell Bank, Yorkshire Coal mining Museum, Harlow Carr, Tropical World and Cliffe Castle. We also invite WonderDome into school to enhance our topic on Earth and Space.

Through our curriculum children will:

Know and remember a variety of Scientific concepts in depth, being able to articulate key facts and vocabulary.

Have experienced a range of scientific enquiries and used these to deepen their understanding of scientific concepts.

Have developed their skills to work scientifically and show an understanding of how they are transferred when learning about different scientific concepts. Demonstrate and articulate an interest for Science; understanding how Science is transferred into our everyday lives.

Our values

One team	Respect	Trust	High expectations	Community
In science we foster collaboration through group work and shared projects, where children work together towards common goals and solve problems collectively. Collaborative problem-solving activities and cross-curricular projects further emphasize the importance of teamwork in scientific inquiry.	Children listen to and value each other's ideas and opinions during discussions and experiments. Respect for diverse viewpoints and scientific perspectives is fostered through collaborative activities and peer feedback. By maintaining a classroom environment where each individual's contributions are acknowledged and valued, children learn the importance of respecting both their peers and the scientific process.	Children are confident in sharing their ideas and findings without fear of judgment. Trust is built through consistent, supportive interactions and by encouraging children to rely on each other's strengths during collaborative tasks and experiments. By emphasizing the importance of reliability and honesty in data collection and peer feedback, children learn to trust their peers and the science.	We have challenging goals and standards for student performance and foster a mindset of striving for excellence. Teachers consistently encourage children to push their boundaries, take on complex problems, and pursue deeper understanding. Our classroom environments promote continuous improvement and a commitment to achieving the best possible outcomes.	Science in the curriculum bridges academic knowledge with real-world understanding, helping children make sense of the world around them. It fosters critical thinking and problem-solving skills that are essential for navigating daily life challenges. Through hands-on experiments and exploration, children gain practical skills in areas such as technology, health, and the environment. By integrating scientific principles, the curriculum prepares learners to apply knowledge in everyday situations, from cooking and healthcare to environmental stewardship.

Key Concepts

The key concepts in Science are covered in throughout the year for every child from pre-school to Y6, children will use and understand the key concept being taught which will help them to develop a love for Science.

Growth	Measure	Energy	Force
To understand how living organisms develop and change over time. Growth is also influenced by genetic factors and environmental conditions, and it is a fundamental concept for understanding life cycles and biological development.	Children will learn to accurately quantify length, mass, volume, and temperature in their investigations. They will understand the importance of accuracy and the impact it can have on their results.	Energy exists in various forms, such as kinetic (movement), potential (stored), thermal (heat), and electrical energy. Energy can be transferred from one object to another or transformed from one form to another, but it cannot be created or destroyed. Understanding energy is fundamental to understanding how scientific processes occur.	Force looks at how objects move, interact, and change direction through pushes, pulls, and friction. Children will identify that forces act upon the Earth and upon objects within the earth, impacting how items behave.

Second order concepts

In Science our second order concepts encourage children to think critically and creatively about the world around them. Second-order concepts, such as cause and consequence, help children understand the relationships between events and their outcomes, fostering deeper critical thinking. Concepts like change and continuity, as well as similarity and difference, encourage learners to compare and contrast ideas or events, identifying patterns over time. Additionally, significance and evidence guide children in evaluating the importance of information and using evidence to support their conclusions, promoting analytical skills and informed decision-making.

Cause & consequence	Change & continuity	Similarity and difference	Significance	Evidence

Curriculum Delivery

All children from preschool to year 6 have access to the science curriculum. EYFS is based on Understanding the world from the Early Year Framework. Children from Year 1 to Year 6 use the Developing Experts scheme and participate in weekly science lessons which are 1 hour and 30 minutes long. This approach allows children to build on knowledge throughout the term and participate in hands on learning through experiments and practical learning tasks.

Throughout the year children learn a variety of science activities and skills aligned with their age, development and national curriculum objectives. They explore topics such as animals including humans, electricity, plants, forces, evolution and many more using a systematic approach provided by the Developing Experts scheme. Each year groups has 6 topics which progresses through different skills, vocabulary and scientific enquiry. each topic build upon skills and knowledge learned in previous years.

Curriculum Coverage

Our curriculum coverage in Science uses the long-term plan from Developing Expert scheme it ensures skills are progressively built upon from EYFS through Year 6. The Developing Experts scheme in Science offers a comprehensive curriculum that ensures thorough coverage of key scientific concepts and skills across all topics. It provides structured lesson plans, experiments, and assessments, helping teachers to deliver engaging content while meeting curriculum standards. The scheme supports both knowledge retention and skill development, ensuring children gain a deep understanding of scientific principles.

Long Term Plan

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Pre-school	**Understanding the worlds Science (developing experts)** • Explore different types of vegetables • Discover different types of fruit • Learn about farm animals • Properties of materials • Changes in state					
Nursery	**Theme: Autumn** all about me, looking after ourselves, seasons, senses, materials and how things work	**Theme: Light and dark seasons, hibernation, night and day animals, shadows, properties of materials.**	**Theme: Antarctica** Antarctica animals, habitats around the world, seasons, climates, Properties of materials, differences in materials.	Seasons, Plant seeds and grow plants, life cycle of plants, living things	**Theme: Minibeasts** All living things, life cycle of plant and animals, plants and flowers, weather/seasons	**Theme: Farm** All living things, life cycle of plant and animals, ocean habitats, the farm, seasons.
Reception	Looking after ourselves, how have I changed, keeping healthy, seasons	Seasons, weather, light and dark, space	Winter, different climates, properties of materials,	Caring for plants and animals, lifecycles	Growing and changing, lifecycles, plants, growing, seasonal changes	Plants and growing, seasons, animals and habitats, weather.
Year 1	**Animals including humans** (about Animals_	**Animals including humans** (About me)	**Exploring every day materials 1**	**Exploring every day materials 2**	Plants	Seasonal change
Year 2	Animals including humans (Growth)	Animals including humans (life cycles)	Everyday materials	Plants	Living things and their habitats (life cycles)	Living things and their habitats (around the world)

Long Term Plan

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 3	Animals including humans	Rocks	Forces and magnets	Light	Plants	Scientific enquiry
Year 4	Animals including humans	Electricity	Sound	States of matter	Living things and their habitats	Living things and their habitats – conservation
Year 5	Animals including humans	Earth and Space	Properties of materials	Changes of materials	Forces	Living things and their habitats (Reproduction including RSE)
Year 6	Animals including humans	Electricity	Evolution and inheritance	Light	Living things and their habitats	Looking after our environment

End points

At Worth Valley Primary School, children begin their science journey in Preschool, where they explore the world through play, curiosity, and observation. By Key Stage 1, they develop foundational skills in identifying, classifying, and experimenting, using hands-on activities to understand basic scientific concepts. In Key Stage 2, children expand their knowledge, conducting more structured investigations and learning to apply critical thinking to solve real-world problems. By Year 6, they are confident in using scientific vocabulary, explaining phenomena, and working collaboratively on experiments. These experiences equip them with the skills and knowledge necessary for success in secondary education and prepare them for a future where science and technology play an essential role in society.

Our end points for science can be found below:

https://www.worthvalleyprimary.co.uk/wp-content/uploads/2024/10/End-points-science.pdf

Vocabulary across the curriculum

Following the Developing Experts scheme, vocabulary progression in science at Worth Valley Primary School is carefully mapped from EYFS to Year 6 to ensure that children build a strong foundation in scientific language. In EYFS, children are introduced to simple scientific terms through hands-on experiences, gradually increasing their understanding of key concepts. As children progress through the school, the complexity of vocabulary increases, enabling them to engage with more advanced scientific ideas and processes. By Year 6, children are confidently using a wide range of scientific terms to describe phenomena, explain their reasoning, and participate in discussions. This structured vocabulary progression supports their ability to articulate scientific understanding, deepens comprehension, and prepares them for more advanced learning in secondary education.

The science progression of vocabulary document can be found below:

https://www.worthvalleyprimary.co.uk/wp-content/uploads/2024/10/Progression-of-Vocabulary-science.pdf

Cross-curricular

At Worth Valley Primary School, cross-curricular science is integrated through the Developing Experts scheme and STEM-based learning. The Developing Experts program provides a structured approach to science education, connecting scientific concepts with other subjects such as math, geography, and literacy. Through STEM (Science, Technology, Engineering, and Mathematics), children apply their scientific knowledge to solve real-world problems, enhancing their critical thinking and problem-solving skills. This approach encourages collaboration, creativity, and innovation as children work on projects that incorporate various disciplines. By linking science with other areas of learning, children gain a deeper understanding of how science impacts the world around them, preparing them for a future driven by technology and discovery.

Curriculum for all

How do we cater for SEND?

At Worth Valley Primary School we believe in the potential of every child to succeed through our Science curriculum. Our science curriculum emphasizes hands-on, practical experiments that engage all children and cater to individual needs within different classrooms. Collaborative activities are integral, allowing children to work together, share ideas, and discuss their findings, fostering a supportive learning environment. By encouraging open dialogue and exchanging opinions, children enhance their understanding through collective problem-solving and critical thinking. The curriculum is designed to be flexible, adapting written work and tasks to meet individual needs, ensuring that every student can participate and excel. This inclusive approach helps build confidence, promotes teamwork, and ensures that every student has the opportunity to contribute to and benefit from their science education, teachers also ensure they have the resources and guidance needed for all children to thrive.

Personal Development in Science

Personal development in science is achieved through encouraging curiosity, critical thinking, and problem-solving skills. As children explore scientific concepts, they learn to question, investigate, and experiment, which builds resilience and independent thinking. Science promotes collaboration, as children work in teams to conduct experiments, discuss findings, and draw conclusions together, reinforcing communication and teamwork skills. Additionally, exploring real-world issues such as sustainability and health through science helps children develop a sense of responsibility and an understanding of the impact their actions have on the world, nurturing a mindset of global citizenship and ethical decision-making. This personal development in science equips children with essential life skills that extend beyond the classroom.

Assessment

At Worth Valley Primary School, formative assessment in Science plays a crucial role in monitoring and enhancing student progress. By aligning with the end points of our Science curriculum, we systematically evaluate whether children have successfully achieved key skills and concepts. This involves identifying areas where children excel and demonstrating proficiency, as well as pinpointing skills that require further development. Through ongoing assessment, we provide targeted oral feedback that supports children in refining their knowledge, vocabulary and skills and enhancing problem-solving strategies. This approach empowers children to recognize their strengths and areas for success.

Enrichment

At Worth Valley Primary School we believe that enrichment is the key to memorable, effective learning. Opportunities are sought to provide the children with scientific knowledge and understanding of the wider world focusing on learning outside the classroom within our units of work. Throughout the year every class takes part in trips or activities to further their knowledge and understanding including farm visits, chicks hatching in school, the WonderDome for earth and space and visiting Magna museum.

Pupil Voice

What do our children say about Science?

Enjoy learning about new things

Loved the experiments in the states of matter topic

I find Science interesting as I learn new ideas.

We enjoyed making models of our teeth.