Mulberry
Wood Wharf Primary

EY, KS1 and KS2 Science Overview

- **Access to education and the chance to be educated is a human right in a civilised world**
- **Education should provide rich intellectual and personal development for individuals and communities of people**
- **Education is a public good**

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Rec, KS1 and KS2
Science Overview

Our Values

Vision

Mulberry Wood Wharf Primary is committed to striving for excellence in all that we do. Our vision is that pupils become creative and ambitious learners who strive to do their best at all times because they are motivated and guided by outstanding teams within the school. They will be able to contribute to their local community and understand how their actions impact upon the wider world. They will be caring citizens who know how to keep themselves safe and who realise that they have a role to play in looking after others. As we develop our teaching and our curriculum, we are aiming for outstanding in all that we do.

Outstanding Achievement For All

Our Values

Our Characteristics of effective learning


We are Authors!


We are designers and artists!


We are Scientists!


We are Historians!


We are explorers!

We are mathmaticians!

We are articulate!


We are performers!

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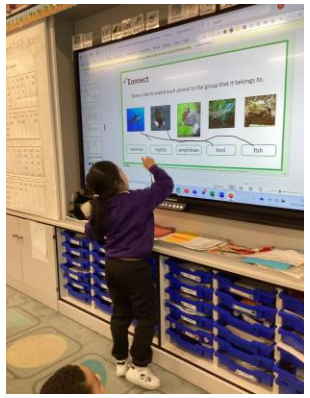
Science Intent



At Mulberry Wood Wharf Primary, we are committed to delivering a rich, evidence-led science curriculum, following the CUSP Science framework. This approach ensures a rigorous, structured progression that closely follows the guidance of the National Curriculum, with an emphasis on long-term retention through retrieval studies and practical application.

Our science curriculum is rooted in the foundations established in the Early Years Foundation Stage (EYFS), focusing on the Natural World and People, Culture, and Communities. In Reception, for example, pupils explore a creative and hands-on science unit that asks, *"What if Little Red Riding Hood's grandma lived in the Arctic?"* In this unit, pupils engage in experiments to discover which foods stay warm and how different clothing materials can keep someone dry and warm in extreme conditions. This playful, real-world exploration of science helps pupils build early knowledge of materials, insulation, and temperature, while fostering curiosity about how science connects to everyday life.

As pupils progress, they build on this foundation, becoming 'a little more expert' in the key scientific domains of Biology, Physics, and Chemistry. These domains cover:

- **Biology**: The study of living organisms, their structures, and environments.
- **Physics**: The study of matter, forces, motion, sound, light, waves, electricity, magnetism, and Earth in Space.
- **Chemistry**: The study of the composition, behaviour, and properties of matter, and the elements of the Earth and its atmosphere.

In CUSP Science, we prioritise both *substantive* knowledge (the factual content and vocabulary of science) and *disciplinary* knowledge (the scientific processes of questioning, observing, testing, and evaluating). Pupils not only learn what science is about but also how to think scientifically, engage in practical investigations, and solve problems using the scientific method.

We intentionally address misconceptions by providing accurate, connected knowledge and contrasting common misunderstandings with factual information. Pupils progressively build their scientific understanding by integrating new knowledge into their existing mental models, which enhances their ability to connect and apply concepts.

Through a focus on *Working Scientifically*, we ensure pupils acquire essential skills like identifying, classifying, observing, measuring, predicting, and concluding. Our curriculum also embeds *Thinking Scientifically*, promoting the development of skills such as pattern seeking, fair testing, and research. These competencies are mapped across Key Stage 1 and 2, ensuring pupils progress in their ability to conduct scientific investigations and analyze data effectively.

At Mulberry Wood Wharf Primary, our science curriculum empowers pupils to become confident, curious scientists, equipped with the knowledge and skills they need to understand the world around them and prepare for future scientific learning.

Science Learning journey Road map

- Coming soon

Making links to the EYFS

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	ELG's	How this is achieved in EYFS	Key Vocabulary to be developed in EYFS		Science KS1	
					Year 1	Year 2
Specific Area of Learning **Understanding the World**	Managing Self • Manage their own basic hygiene and personal needs, including dressing, going to the toilet, and understanding the importance of healthy food choices. ELG 14 The Natural World • Explore the natural world around them, making observations and drawing pictures of animals and plants.	• Discussions at snack time of the importance of healthy food choices. • During lunch time discussions. • Through stories and circle time discussions, e.g. the story – Now wash your hands and Funny bones. • P.E lessons that encourage getting dressed and undressed independently. • Naming body parts through songs – Heads, shoulders, knees, and toes. • RSE link – Correct naming of body parts. • Talking about pets at home. • Exploring minibeasts and recording our observations.	• Exercise • Healthy • Wash • Toothbrush • Tooth / Teeth • Body • Head • Bones • Skeleton • Family	• Animal • Human • Mammal • Bird • Fish • Amphibian • Insect • Lifecycle • Nocturnal	Animals, including humans.	
	ELG 14 The Natural World • Explore the natural world around them, making observations and drawing pictures of animals and plants.	• Going on walks to observe the local environment and to compare and learn about the seasons. • Taking photos to compare seasons and discuss. • Planting seeds and plants. • Looking after the EYFS garden. • Creating bug hotels.	• Lifecycle • Plant • seed • grow • roots • Flower	• Seasons • Autumn • Winter • Spring • Summer • Change • Weather	Plants Seasonal changes	Living things and their habitats.
	ELG 14 The Natural World • Understanding some important processes and changes in the natural world around them, including seasons and changing states of matter.	• Growing plants from bulbs and seeds. • Making boats to explore best materials. • Water tray activities to explore water, ice, and materials that float and sink. • Testing the best material for a raincoat for Paddington bear.	• Material • Wood • Plastic • Glass • Float	• Sink • Liquid • Solid	Everyday materials	Uses of everyday materials.
Scientific Vocabulary – scientist, sort, observation, identify, compare, group, investigate, test, evaluate						

Year group sequencing

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	Autumn	Spring	Summer
Year 1	Seasonal changes and daily weather Introduce Plants – (trees) Animals, including humans	Everyday materials Revisit 1: Animals, including humans	Plants Revisit 2: Plants, Animals including humans
Year 2	Living things and their habitats Animals, including humans	Uses of everyday materials Revisit Living things and their habitats / materials	Plants Revisit Living things and their habitats / Animals, including humans
Year 3	Rocks Animals, including humans Revisit Rocks	Forces and magnets Plants	Plants continued… Light
Year 4	Living things and their habitats States of matter	Animals, including humans	Electricity Sound
Year 5	Properties and changes of materials Animals, including humans	Forces (Gravity and Galileo) Earth in space	Living things and their habitats Forces continued
Year 6	Electricity Animals including humans (circulatory system)	Animals including humans (water transport) Light	Living things and their habitats Evolution and inheritance

Thinking and working scientifically

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Pupils construct understanding by applying substantive knowledge to questioning and planning, observing, performing a range of tests, accurately measuring, comparing through identifying and classifying, using observations and gathering data to help answer questions, explaining and reporting, predicting, concluding, improving, and seeking patterns. We call it 'Working Scientifically.' Teachers plan to model and teach how to think like a scientist, developing the following areas of working scientifically over time:

Key Stage 1

Asking simple questions and recognising that they can be answered in different ways	Observing closely, using simple equipment	Performing simple tests	Identifying and classifying	Using their observations and ideas to suggest answers to questions	Gathering and recording data to help in answering questions

Lower Key Stage 2

Ask relevant questions	Set up simple, practical enquiries and comparative and fair tests	Make accurate measurements using standard units, using a range of equipment, e.g. thermometers and data loggers	Gather, record, classify and present data in a variety of ways to help in answering questions	Record findings using simple scientific language, drawings, labelled diagrams, bar charts and tables	Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions	Use results to draw simple conclusions and suggest improvements, new questions and predictions for setting up further tests	Identify differences, similarities or changes related to simple, scientific ideas and processes

By the end of year 1

		BIOLOGY	PHYSICS	CHEMISTRY
		Pupils develop an understanding of the concept of BIOLOGY through:	**Pupils develop an understanding of the concept of PHYSICS through:**	**Pupils develop an understanding of the concept of CHEMISTRY through:**
Autumn	Seasonal changes and daily weather *Physics*	• knowing and explaining what an animal is and what a plant is • knowing and explaining how seasons influence plants and animals • knowing and identifying the common features of fish, amphibians, reptiles, birds and mammals	• knowing and explaining the order of seasons • knowing and explaining the changes within each season including months of the year • knowing different patterns of weather and explaining, for example, how rain can occur in all seasons • knowing that the earth rotates and explaining how day and night occurs	• knowing the properties of everyday materials, such as wood, plastic, glass, metal, water, and rock • knowing and explaining the difference between an object and the material from which it is made, such as metal and a spoon • knowing and explaining the properties of materials, such as hard / soft, stretchy, / stiff, rough / smooth, bendy / rigid, waterproof /not waterproof, absorbent / not absorbent, opaque / translucent / transparent • knowing, explaining and grouping a range of everyday materials depending on their properties
Spring Summer	Animals, including humans *Biology*	• knowing, explaining and grouping animals by the types of food they eat • knowing and explaining the places (habitats) that fish, amphibians, reptiles, birds and mammals live • knowing and locating the main body parts of a human • knowing the five senses and explaining how they help compare different textures, sounds and smells		
Autumn	Everyday materials *Chemistry*			
Spring Summer	Plants *Biology*	• knowing and identifying the basic structure of plants and trees, such as roots, bulbs, stem, leaf, flower, fruits, trunk, branch and crown • knowing and identifying the common names of wild and garden plants • knowing and identifying explaining different trees in the locality, such as oak or Scots Pine… • knowing and explaining the difference between evergreen and deciduous trees, including the influence of seasons		

By the end of Year 2

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Autumn

Spring

Summer

Autumn

Summer

Spring

Summer

	BIOLOGY	PHYSICS	CHEMISTRY
	Pupils develop an understanding of the concept of BIOLOGY through:	**Pupils develop an understanding of the concept of PHYSICS through:**	**Pupils develop an understanding of the concept of CHEMISTRY through:**
Living things and their habitats *Biology*	• knowing and explaining the common characteristic of living things, such as MRS GREN • knowing and explaining the difference between things that are living, dead and things that have never been alive • knowing and explaining what a habitat is and why plants and animals that live there are best suited to it	•	• knowing and explaining what properties everyday materials have • knowing, comparing and explaining the properties and suitability of everyday materials for particular uses, such as glass in windows or bricks for building – identifying what is suitable or unsuitable • knowing and explaining how the shape of everyday materials can be changed, for example by squashing, bending, twisting and stretching • explaining how significant scientists have made useful things from knowing about the properties of materials, such as Charles Macintosh
Animals, including humans *Biology*	• knowing and identifying a variety of plants and animals in micro-habitats and habitats • knowing and explaining what an animal is and how they get their food from other plants and animals • knowing and explaining what a simple food chain is, including the direction of energy		
Uses of everyday materials *Chemistry*	• knowing and explaining that animals, including humans, have offspring which grow into adults • knowing and explaining simple life cycles of animals, including humans • knowing and explaining that animals need water, food and air to survive • knowing and explaining that to be healthy, humans need to exercise, eat the right amounts of different types of food and keep clean		
Plants *Biology*	• knowing and explaining what conditions are needed for seeds to germinate and mature into plants • knowing and explaining how bulbs grow • knowing and explaining the conditions that plants need to thrive, grow, mature, and reproduce		

By the end of Year 3

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	BIOLOGY	PHYSICS	CHEMISTRY
	Pupils develop an understanding of the concept of BIOLOGY through:	**Pupils develop an understanding of the concept of PHYSICS through:**	**Pupils develop an understanding of the concept of CHEMISTRY through:**
Rocks *Chemistry*	• knowing and explaining that animals, including humans, need the right types and amounts of nutrition • knowing and explaining that animals only get nutrition from the food they eat – they cannot make their own food like plants	• knowing how objects move on different surfaces using friction and resistance to explain why • knowing and explaining the difference between contact and non-contact forces	• knowing and explaining that rocks can be grouped together on the basis of their appearance and properties • knowing and explaining how rocks are formed • knowing and explaining what a rock is and what is not a rock
Animals, including humans *Biology*	• knowing, identifying and explaining the purpose and function of the human skeleton, such as supporting the body, protecting the lungs and helping joints move • knowing, identifying and explaining the purpose and function of the muscles, such as skeletal, cardiac or smooth muscles	• knowing and explaining how magnets attract and repel each other • knowing and explaining how magnets attract some materials and not others	• knowing and explaining different types of rock, such as igneous, sedimentary and metamorphic rock • knowing and explaining how fossils of animals and plants are formed
Forces and magnets *Physics*	• knowing and explaining the difference between vertebrates and invertebrates	• using what they know about the properties of materials from KS1 to group everyday materials that are attracted to a magnet • knowing and identifying magnetic materials • knowing and explaining that a magnet has two poles, and predicting whether they will attract or repel each other	• knowing and explaining the different types of fossils, including body and trace fossil • knowing and explaining what soil is made from • knowing and explaining the different types of material that make up soil, including rocks and organic matter
Plants *Biology*	• knowing and identifying the structure of the different parts of flowering plants • knowing and explaining the function of the parts of flowering plants • knowing and explaining what plants need to live and grow, such as air, light, water, nutrients from soil and space to grow		
Light *Physics*	• knowing how water is transported within plants and explaining the process of transpiration • knowing and explaining the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal	• knowing and explaining that light is needed to see things • knowing and explaining that dark is the absence of light • knowing and explaining that light is reflected from surfaces and enters our eyes • knowing that the light of the sun can be dangerous and how to protect their eyes • knowing and explaining that shadows are formed when light from a source is blocked by an opaque object • knowing and explaining how shadows change size	

Assessment In Science

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Assessment in science is both formative and at the point of learning as well as summative to feed forward to the next point of contact pupils will have.

Recording of assessment is multi-faceted. We support whole class feedback and marking principles. The following are used to assess pupils' knowledge and skills as well as their understanding and use of relevant vocabulary.

- Whole class marking and feedback.
- Formative outcomes from cumulative quizzing
- Summative outcomes from cumulative quizzing.
- Structured explanative tasks such as vocabulary connections.
- Structured assessment tasks such as 'Show what you know'.
- Cumulative end goals for each of the strands of science.

These specify what pupils should know and be able to explain at the end of each year group. At the end of each academic year, this all feeds into a final overall assessment judgement for science, which is reported to parents. This judgement reflects how secure the pupil's knowledge and understanding in the learning taught that year has been.

How do we measure the impact of our Science Curriculum?

We evaluate the impact of our Science curriculum in the following ways:

- Pupil Book Study: Small groups of pupils from each class are asked to talk about what they remember about their learning in Science. These sessions are led by the Science Leader and provide an extremely useful insight into the impact of the curriculum on pupil's learning.
- Lesson visits. The Science leader visits a sample of lessons over the year to evaluate the quality of teaching and learning.
- Book looks: The subject leader looks at samples of Science books. Often this is done in conjunction with the Pupil Book Study.
- Supported planning and teaching: The leader works alongside the class teacher to support the planning and teaching, providing quality assurance.
- This all feeds into a termly subject leader evaluation.

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How do we adapt our Science curriculum to include all learners?

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It is our expectation that all pupils participate fully in science lessons. We use adapted tasks to support some pupils in accessing the same learning question as their peers. A small number of pupils may be working towards adapted end points for science or may be working at a pre-subject specific stage of development. Details of the provision for these pupils can be found in their individual learning plan