

St Mary's CofE Primary School



Science Curriculum Overview

Statement of Intent:

At St Mary's, our Science curriculum inspires every child to be curious, ask questions and develop a sense of wonder about the world around them. We nurture a love of discovery, encouraging children to explore ideas, investigate problems and develop the confidence to think scientifically. From Early Years to Year 6, children build their scientific knowledge and understanding, learning to observe carefully, question thoughtfully and use evidence to explain their findings. Through practical investigations, collaboration and discussion, pupils develop the courage to test ideas, the resilience to learn from mistakes and the respect to consider different perspectives. By exploring the natural world, scientific discoveries and the impact of human activity, children develop an appreciation of their responsibility to care for the environment and an understanding of how science can improve lives and shape the future.

Aims:

We base our Science curriculum on the Kapow scheme of work. This supports our aim to develop pupils' curiosity, scientific knowledge and understanding of the natural world, encouraging them to think and work like scientists. The intention is for pupils to develop secure knowledge across biology, chemistry and physics, alongside the skills to ask questions, carry out investigations, observe, measure, analyse evidence and draw conclusions. The scheme promotes an understanding of how scientific discoveries influence everyday life and contribute to developments across the world. It encourages children to think critically, communicate their ideas clearly and develop confidence in using scientific vocabulary. The scheme supports teachers in developing their subject knowledge and pedagogical confidence, enabling the delivery of engaging, practical and purposeful lessons. The curriculum is designed to be both inclusive and ambitious, ensuring all pupils have opportunities to investigate, discover and succeed in Science.

How Science is taught at St Mary's:

At St Mary's, Science is taught through exploration, investigation and the development of scientific understanding. Children are encouraged to ask questions, make predictions, investigate ideas and use evidence to explain their findings. Working scientifically is embedded throughout the curriculum, with pupils developing their skills through observing over time, identifying and classifying, pattern seeking, comparative and fair testing, and researching using secondary sources. Through practical experiences, outdoor learning and opportunities to explore the local environment, children make meaningful connections between scientific concepts and everyday life. They learn to work collaboratively, communicate their findings respectfully and recognise the importance of evidence when forming conclusions. As they progress from Early Years to Year 6, children develop increasingly secure scientific knowledge, greater independence in their investigations and the confidence to think critically about the world around them.

Long Term Overview

Year	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Nursery	Materials and textures	Changing states	Winter to spring	Local environments: plants and animals	Animal and plant life cycles	Growing plants from seeds
Reception	Seasonal change: winter	Changing states	Winter to spring	Seasonal change: spring	Observing animals and body parts	Seasonal change: summer
Year 1	Plants	Sensitive bodies	Comparing animals	Everyday materials	Seasonal changes	Science through stories
Year 2	Habitats	Microhabitats	Uses of everyday materials	Life cycles and health	Plant growth	Plant-based materials
Year 3	Movement and nutrition	Forces and magnets	Rocks and soil	Light and shadows	Plant reproduction	Does hand span affect grip strength?
Year 4	Digestion and food	Electricity and circuits	States of matter	Sound and vibrations	Classification and changing habitats	How does the flow of liquids compare?
Year 5	Mixtures and separation	Properties and changes	Earth and space	Life cycles and reproduction	Unbalanced forces	Human timeline
Year 6	Classifying big and small	Light and reflection	Evolution and inheritance	Circuits, batteries and switches	Circulation and health	Are some sunglasses safer than others?

Nursery | A. Substantive knowledge and vocabulary

Planned units: Exploring materials and textures; changing states; seasonal change; local environments; life cycles; growing seeds

Knowledge domain	End-of-year knowledge: pupils should know and understand
Living things and plants	Notice familiar plants and animals outdoors; recognise that living things grow and change; help plant seeds and care for them using water and light.
Seasons and environments	Notice changes in weather, trees and the school grounds; talk about what they see, hear and feel in different seasons.
Materials and changes	Explore texture and familiar materials using the senses; notice ice melting, water freezing and materials changing when mixed or warmed, with adult support.
Movement and forces	Explore how objects move when pushed, pulled, rolled or dropped during play.

Priority scientific vocabulary

plant, seed, grow, leaf, flower, animal, baby, adult, weather, season, cold, warm, ice, water, melt, hard, soft, rough, smooth, push, pull, change

Science in action

Care for plants, animals and the outdoor environment; begin to talk about safe and respectful exploration.

Developmental note: taught through play, first-hand exploration, adult modelling, stories and sustained shared thinking.

Nursery | B. Disciplinary knowledge and scientific enquiry

Disciplinary strand	Progression and expected application
Questions and predictions	Show curiosity, ask “what?” and “why?” and suggest what might happen in familiar play.
Observing and measuring	Explore using senses, notice visible changes and use everyday comparison words such as bigger, smaller, warmer and wetter.
Recording and communicating	Talk about findings, show objects, make marks or use photographs with adult support.
Evidence and evaluation	Say what happened and whether it was the same or different from what they expected.
Science in action	Care for seeds, plants, animals and shared outdoor spaces; handle resources safely.

The five enquiry approaches

Across the curriculum pupils encounter: Observing over time; Pattern seeking; Identifying and classifying; Comparative and fair testing; Research using secondary sources. The approaches are selected according to the scientific question, not treated as a separate weekly checklist.

Suggested enquiries linked to planned learning

- What happens to ice when it is warm?
- What changes can we notice outside as winter becomes spring?
- What happens to our seeds when we water them?

Assessment prompts

What did you notice? • What evidence supports your explanation? • How could you check or improve your investigation?

In EYFS, observations and explanations may be verbal, practical or represented through drawings and photographs.

Reception | A. Substantive knowledge and vocabulary

Planned units: Seasonal change; changing states; observing animals; natural world

Knowledge domain	End-of-year knowledge: pupils should know and understand
Living things and plants	Recognise familiar plants and animals and describe observable features; know that seeds can grow into plants and animals grow and change; explore simple life cycles through direct observation and stories.
Seasons and environments	Describe seasonal changes in weather, plants and animals; compare familiar environments and recognise some similarities and differences.
Materials and changes	Compare properties of everyday materials; observe changes such as melting and freezing; use everyday language to explain what they notice.
Movement and forces	Investigate how objects move and what happens when they are pushed, pulled or released.

Priority scientific vocabulary

observe, compare, predict, explain, life cycle, habitat, environment, seed, roots, stem, leaf, season, weather, material, transparent, melt, freeze, push, pull

Science in action

Care for living things and habitats; understand simple ways to protect the natural world and explore safely.

Developmental note: taught through play, first-hand exploration, adult modelling, stories and sustained shared thinking.

Reception | B. Disciplinary knowledge and scientific enquiry

Disciplinary strand	Progression and expected application
Questions and predictions	Ask questions about natural phenomena and suggest an outcome using experience.
Observing and measuring	Observe closely, compare, sort and notice simple patterns; use magnifiers and simple equipment with support.
Recording and communicating	Use talk, drawings, photographs and simple adult-supported charts to represent observations.
Evidence and evaluation	Explain what they noticed and compare the outcome with their original idea.
Science in action	Recognise simple ways to protect living things and the local environment.

The five enquiry approaches

Across the curriculum pupils encounter: Observing over time; Pattern seeking; Identifying and classifying; Comparative and fair testing; Research using secondary sources. The approaches are selected according to the scientific question, not treated as a separate weekly checklist.

Suggested enquiries linked to planned learning

- Which materials let us see through them?
- How does a plant change as it grows?
- What differences can we notice between familiar animals?

Assessment prompts

What did you notice? • What evidence supports your explanation? • How could you check or improve your investigation?

In EYFS, observations and explanations may be verbal, practical or represented through drawings and photographs.

Year 1 | A. Substantive knowledge and vocabulary

Planned units: Plants; sensitive bodies; comparing animals; everyday materials; seasonal changes

Knowledge domain	End-of-year knowledge: pupils should know and understand
Plants and seasons	Identify common wild and garden plants and deciduous/evergreen trees; name roots, stem, leaves and flowers; observe seasonal weather and variation in day length.
Animals and humans	Identify common animal groups and basic structures; compare carnivores, herbivores and omnivores; name main human body parts and relate senses to body parts.
Everyday materials	Distinguish an object from the material it is made of; name wood, plastic, glass, metal, water and rock; describe and compare simple physical properties.

Priority scientific vocabulary

plant, deciduous, evergreen, root, stem, flower, seed, season, weather, mammal, bird, reptile, amphibian, fish, carnivore, herbivore, omnivore, senses, material, waterproof, absorbent

Science in action

Explain basic seasonal safety, including not looking directly at the Sun; recognise uses of materials and people who use science.

Year 1 | B. Disciplinary knowledge and scientific enquiry

Disciplinary strand	Progression and expected application
Questions and planning	Ask simple questions and follow a guided approach to answering them.
Observing and measuring	Observe using senses and simple equipment; make comparisons and begin using non-standard or basic standard units.
Recording and communicating	Sort by observable properties; use drawings, labels, tallies and prepared tables; describe what was seen.
Evidence and evaluation	Use observations to answer a question and notice when results differ from expectations.
Science in action	Identify everyday uses of science and describe safe ways to explore.

The five enquiry approaches

Across the curriculum pupils encounter: Observing over time; Pattern seeking; Identifying and classifying; Comparative and fair testing; Research using secondary sources. The approaches are selected according to the scientific question, not treated as a separate weekly checklist.

Suggested enquiries linked to planned learning

- Which plants grow in different parts of the school grounds?
- How do everyday materials differ in observable properties?
- How does the weather change across the year?

Assessment prompts

What did you notice? • What evidence supports your explanation? • How could you check or improve your investigation?

Year 2 | A. Substantive knowledge and vocabulary

Planned units: Habitats; microhabitats; uses of materials; life cycles and health; plant growth

Knowledge domain	End-of-year knowledge: pupils should know and understand
Living things and habitats	Distinguish living, dead and never alive; identify habitats and microhabitats; explain how living things depend on each other and represent simple food chains.
Plants and life cycles	Know that seeds and bulbs grow into plants; describe needs for germination and healthy growth; describe offspring growing into adults and some animal life cycles.
Health and materials	Explain basic needs of animals including humans and the importance of food, exercise and hygiene; compare suitability of materials and how some solids can be bent, twisted, stretched or squashed.

Priority scientific vocabulary

habitat, microhabitat, alive, dead, food chain, predator, prey, offspring, life cycle, germinate, seedling, bulb, suitable, flexible, elastic, hygiene, exercise

Science in action

Apply knowledge to choosing plant-based materials and reducing waste; explain how people can care for habitats.

Year 2 | B. Disciplinary knowledge and scientific enquiry

Disciplinary strand	Progression and expected application
Questions and planning	Suggest simple questions and recognise that observation, sorting or a simple test can provide answers.
Observing and measuring	Observe changes over time and use simple measuring equipment with increasing accuracy.
Recording and communicating	Record findings using tables, diagrams, pictograms or block graphs; group using visible characteristics.
Evidence and evaluation	Use recorded observations to explain findings and notice surprising results.
Science in action	Apply findings to material choice, health and care for habitats.

The five enquiry approaches

Across the curriculum pupils encounter: Observing over time; Pattern seeking; Identifying and classifying; Comparative and fair testing; Research using secondary sources. The approaches are selected according to the scientific question, not treated as a separate weekly checklist.

Suggested enquiries linked to planned learning

- Which microhabitats contain different living things?
- What conditions help seeds germinate?
- Which material is most suitable for a plant pot and why?

Assessment prompts

What did you notice? • What evidence supports your explanation? • How could you check or improve your investigation?

Year 3 | A. Substantive knowledge and vocabulary

Planned units: Movement and nutrition; forces and magnets; rocks and soil; light and shadows; plant reproduction

Knowledge domain	End-of-year knowledge: pupils should know and understand
Animals and nutrition	Explain skeletons and muscles in movement, protection and support; recognise that animals need appropriate nutrition and humans obtain nutrients from food.
Plants	Describe plant-part functions, water transport, requirements for life and growth, pollination, seed formation and dispersal.
Rocks, light and forces	Compare rocks and soils and explain simple fossil formation; explain that light is needed to see, shadows form when light is blocked and sunlight can be dangerous; investigate contact forces, friction and magnetism.

Priority scientific vocabulary

skeleton, muscle, nutrient, pollination, seed dispersal, fossil, sedimentary, soil, light source, reflection, opaque, shadow, force, friction, attract, repel, magnetic

Science in action

Link rock properties to uses, plant reproduction to ecosystems, and forces to familiar technologies.

Year 3 | B. Disciplinary knowledge and scientific enquiry

Disciplinary strand	Progression and expected application
Questions and planning	Raise relevant questions; begin to choose an enquiry method and recognise what needs to change or remain the same.
Observing and measuring	Use appropriate equipment, standard units and repeated observations when useful.
Recording and communicating	Create simple tables and bar charts; use labelled diagrams and increasingly precise vocabulary.
Evidence and evaluation	Explain results using evidence, identify patterns and suggest a practical improvement.
Science in action	Recognise how scientists use evidence and how science supports familiar technologies.

The five enquiry approaches

Across the curriculum pupils encounter: Observing over time; Pattern seeking; Identifying and classifying; Comparative and fair testing; Research using secondary sources. The approaches are selected according to the scientific question, not treated as a separate weekly checklist.

Suggested enquiries linked to planned learning

- How does shadow size change when the light source moves?
- Which materials are attracted to a magnet?
- Does hand span affect grip strength?

Assessment prompts

What did you notice? • What evidence supports your explanation? • How could you check or improve your investigation?

Year 4 | A. Substantive knowledge and vocabulary

Planned units: Digestion and food; electricity and circuits; states of matter; sound; classification and habitats

Knowledge domain	End-of-year knowledge: pupils should know and understand
Animals and living things	Describe digestion and tooth functions; construct simple food chains; group living things using classification keys; explain that environments change and may pose dangers.
States of matter	Group solids, liquids and gases; explain melting, freezing, evaporation and condensation; describe the water cycle and factors affecting evaporation.
Electricity and sound	Construct simple series circuits and explain components, switches and conductors/insulators; describe sound as vibrations and how pitch, volume and distance affect what is heard.

Priority scientific vocabulary

digestive system, oesophagus, intestine, incisor, canine, classification key, conservation, solid, liquid, gas, evaporation, condensation, water cycle, vibration, pitch, volume, circuit, conductor, insulator

Science in action

Apply learning to dental health, electrical safety, protecting hearing and environmental conservation.

Year 4 | B. Disciplinary knowledge and scientific enquiry

Disciplinary strand	Progression and expected application
Questions and planning	Choose between enquiry methods and plan comparative tests, identifying variables to change, measure and control.
Observing and measuring	Select suitable equipment and take increasingly precise readings over time or between groups.
Recording and communicating	Present results in appropriate tables, charts, diagrams and simple classification keys.
Evidence and evaluation	Use results to draw conclusions, identify anomalies and consider whether a method was fair or reliable.
Science in action	Connect findings to health, safety, conservation and applications of electricity and sound.

The five enquiry approaches

Across the curriculum pupils encounter: Observing over time; Pattern seeking; Identifying and classifying; Comparative and fair testing; Research using secondary sources. The approaches are selected according to the scientific question, not treated as a separate weekly checklist.

Suggested enquiries linked to planned learning

- How does temperature affect the rate of evaporation?
- Which materials conduct electricity?
- How does the flow of different liquids compare?

Assessment prompts

What did you notice? • What evidence supports your explanation? • How could you check or improve your investigation?

Year 5 | A. Substantive knowledge and vocabulary

Planned units: Mixtures and separation; properties and changes; Earth and space; life cycles; forces; human timeline

Knowledge domain	End-of-year knowledge: pupils should know and understand
Materials and changes	Compare materials by solubility, transparency, conductivity and other properties; explain solutions, separating mixtures, and reversible versus irreversible changes.
Earth and space	Describe Earth and other planets orbiting the Sun, the Moon orbiting Earth and Earth's rotation causing day and night; identify the Sun as a star.
Forces	Explain gravity and the effects of air resistance, water resistance and friction; recognise how levers, pulleys and gears affect forces.
Living things and humans	Compare life cycles and reproduction in plants and animals; describe human development, including puberty, sensitively and accurately.

Priority scientific vocabulary

soluble, insoluble, dissolve, solution, filter, sieve, reversible, irreversible, conductivity, orbit, rotation, planet, gravity, friction, resistance, lever, pulley, reproduction, puberty

Science in action

Connect materials to everyday design, forces to mechanisms and space science to observation and technology.

Year 5 | B. Disciplinary knowledge and scientific enquiry

Disciplinary strand	Progression and expected application
Questions and planning	Justify enquiry choice, plan fair comparisons and explain variables and controls; consider repeat measurements.
Observing and measuring	Choose equipment and units, measure precisely and collect repeat readings where helpful.
Recording and communicating	Design tables with headings and units; use graphs and scientific diagrams to present findings.
Evidence and evaluation	Interpret trends, use results to support conclusions and evaluate limitations and reliability.
Science in action	Explain how science informs engineering, materials selection and understanding of space and living things.

The five enquiry approaches

Across the curriculum pupils encounter: Observing over time; Pattern seeking; Identifying and classifying; Comparative and fair testing; Research using secondary sources. The approaches are selected according to the scientific question, not treated as a separate weekly checklist.

Suggested enquiries linked to planned learning

- How can we separate different mixtures?
- How does surface area affect air resistance?
- How do life cycles of different animals compare?

Assessment prompts

What did you notice? • What evidence supports your explanation? • How could you check or improve your investigation?

Year 6 | A. Substantive knowledge and vocabulary

Planned units: Classification; light and reflection; evolution and inheritance; circuits; circulation and health

Knowledge domain	End-of-year knowledge: pupils should know and understand
Living things and evolution	Classify living things using observable characteristics and branching keys; explain fossils, inheritance, variation, adaptation and change over long periods.
Human biology	Identify heart, blood and blood vessels and describe circulation and transport of nutrients; explain the effects of exercise, diet, drugs and lifestyle.
Light and electricity	Explain that light travels in straight lines, reflection and how shadows form; use conventional symbols to represent series circuits and investigate effects of components and cell number/voltage.

Priority scientific vocabulary

organism, microorganism, classification, adaptation, inheritance, variation, evolution, fossil, circulatory system, oxygen, nutrient, pulse, reflection, light ray, circuit diagram, voltage, variable, reliable, evidence

Science in action

Apply evidence to health and sun safety; recognise that scientific explanations change when new evidence is available.

Year 6 | B. Disciplinary knowledge and scientific enquiry

Disciplinary strand	Progression and expected application
Questions and planning	Independently select an appropriate enquiry method, control variables and justify plans for accurate, repeatable evidence.
Observing and measuring	Use a range of instruments accurately and take repeat readings; calculate a mean where appropriate.
Recording and communicating	Choose suitable tables, graphs, classification keys and conventional circuit diagrams.
Evidence and evaluation	Evaluate patterns, anomalous results, reliability and limitations; use evidence to support or refute claims and propose further enquiries.
Science in action	Discuss how evidence can change scientific explanations and inform health, technology and environmental decisions.

The five enquiry approaches

Across the curriculum pupils encounter: Observing over time; Pattern seeking; Identifying and classifying; Comparative and fair testing; Research using secondary sources. The approaches are selected according to the scientific question, not treated as a separate weekly checklist.

Suggested enquiries linked to planned learning

- How does the number of cells affect a bulb in a circuit?
- How can a classification key distinguish organisms?
- Are some sunglasses safer than others?

Assessment prompts

What did you notice? • What evidence supports your explanation? • How could you check or improve your investigation?

