# Science at St Margaret's

At St Margaret's, we believe that science makes a valuable and distinctive contribution to every child's education. It influences many aspects of our daily lives and helps shape the world we live in. A high-quality science education lays the foundation for understanding the world through the key disciplines of biology, chemistry, and physics.

Science has transformed our lives and is essential to the future prosperity of our planet. Therefore, all children should be taught the fundamental knowledge, methods, processes and applications of science. By building a strong foundation of key concepts and knowledge, we aim to inspire children to appreciate the power of rational explanation and to develop a sense of excitement and curiosity about the world around them.

Through high-quality teaching, we help pupils understand how major scientific ideas have shaped society and continue to influence our lives. Our goal is to prepare children for life in an increasingly scientific and technological world.

**We achieve this by:**

- Delivering high-quality, engaging, and inspiring science lessons;
- Using scientific contexts to reinforce and extend cross-curricular skills in Literacy, Maths, and Computing;
- Teaching science within global and historical contexts, highlighting the contributions of significant scientists from diverse cultures;
- Developing and deepening pupils' scientific knowledge and understanding;
- Encouraging pupils to work scientifically by planning, conducting, and evaluating investigations;
- Expanding pupils' scientific vocabulary and helping them articulate scientific ideas clearly and accurately;
- Promoting collaboration and independent learning, perseverance, and the ability to ask meaningful, investigable questions.

## Our Curriculum

At St Margaret's, our science curriculum is underpinned by the purposeful sequencing of scientific knowledge and the development of working scientifically skills. It is delivered through carefully structured units across the academic year, each designed to foster a deep understanding of key scientific concepts and adapted to meet the specific needs of our school's context. These units also promote meaningful cross-curricular links, enriching pupils' learning experiences and encouraging broader thinking. This systematic approach enables pupils to build knowledge progressively, deepen their conceptual understanding, and grow into confident, inquisitive scientists.

We implement the 2014 National Curriculum for Science through a series of planned units that:

- Reflect the core aims of science education;
- Provide clear opportunities for progression and continuity;
- Support pupils in achieving their full potential;
- Offer a diverse range of learning experiences, including opportunities for practical scientific enquiry.

The programmes of study for science are set out year-by-year for Key Stages 1 and 2. They outline a coherent sequence of knowledge and concepts, with statutory content that must be taught by the end of each key stage. This framework informs termly and weekly planning, ensuring continuity across year groups and the revisiting of key topics to reinforce learning.

While progression is essential, we place equal emphasis on securing a solid understanding of each foundational block of knowledge. This ensures pupils are well-prepared to move confidently to the next stage of their scientific education.

Lesson structure and frequency within each unit may vary to best support the acquisition of knowledge and skills. For example, a unit may be delivered through a series of shorter lessons over several weeks or through more intensive sessions within a condensed timeframe.

To support long-term retention and retrieval of knowledge, pupils regularly engage in retrieval tasks that challenge them to recall learning from previous lessons, units, and year groups.

We are committed to ensuring that our science curriculum is accessible to all learners. Where necessary, adaptations are made based on ongoing assessment, monitoring, and—where applicable—individual support plans and EHCPs. These adjustments ensure that every child can engage meaningfully with the curriculum and achieve success.

### Working Scientifically

'Working scientifically' specifies the understanding of the nature, processes and methods of science for each year group. During all key stages, the 'working scientifically' key skills must be taught within each area of science, in accordance with the 2014 National Curriculum programme of study. It should not be taught as a separate strand. Focus should be on the key features of scientific enquiry, so that pupils learn to use a variety of approaches to answer relevant scientific questions. These types of scientific enquiry should include observing over time; pattern seeking; identifying, classifying and grouping; comparative and fair testing (controlled investigations); and researching using secondary sources. Pupils should seek answers to questions through collecting, analysing and presenting data.

## EYFS and 'Understanding the World'

In the Foundation Stage, children begin to explore Science through the 'Understanding the World' area of the EYFS curriculum. Learning is rooted in their interests and real-life experiences, enabling them to make sense of the world in a practical and meaningful way. At St Margaret's, we plan these opportunities in line with the Early Learning Outcomes and Goals, ensuring that children develop secure foundations for future scientific understanding. Through hands-on exploration, observation, and simple investigations, pupils' natural curiosity is nurtured and the early skills of scientific thinking—such as noticing, questioning, and predicting—begin to develop. For example, children plant and care for a bean, observing how it changes over time, and explore seasonal changes using our beautiful school grounds. These experiences lay the groundwork for more formal scientific learning in later years.

### Key Stage 1 (Years 1 and 2)

The principal focus of science teaching in key stage 1 is to enable pupils to experience and observe phenomena, looking more closely at the natural and humanly constructed world around them. They

should be encouraged to be curious and ask questions about what they notice. They should be helped to develop their understanding of scientific ideas by using different types of scientific enquiry to answer their own questions, including observing changes over a period of time, noticing patterns, grouping and classifying things, carrying out simple comparative tests, and finding things out using secondary sources of information. They should begin to use simple scientific language to talk about what they have found out and communicate their ideas to a range of audiences in a variety of ways. Most of the learning about science should be done using first-hand practical experiences, but there should also be some use of appropriate secondary sources, such as books, photographs and videos.

### Year 1

In Year 1, pupils begin their scientific journey by exploring the world around them through observation, questioning, and hands-on experiences. The curriculum introduces key concepts in biology, chemistry, and physics in an age-appropriate way, covering topics such as plants, animals including humans, everyday materials, and seasonal changes. Pupils will identify and name a variety of common plants, animals and everyday materials; sort materials based on their physical properties; and label the basic parts of the human body. Pupils learn to identify and classify, observe closely, and carry out simple tests, developing early skills in working scientifically. This builds on their EYFS understanding of the natural world and lays the foundation for future learning by establishing key vocabulary and concepts. The Year 1 curriculum encourages curiosity and prepares pupils for more structured investigations and deeper scientific enquiry in Year 2 and beyond.

### Year 2

In Year 2, pupils build on their Year 1 knowledge of plants, animals, and materials by exploring these topics in greater depth and complexity. Pupils will identify and compare suitability of materials for particular uses and explore how solid materials can be changed. They will learn about and describe the basic needs of animals, including humans, for survival (water, food and air) and the importance for humans of exercise, eating the right amounts of different types of food, and hygiene. Building on from Year 1, pupils will observe and describe how seeds and bulbs grow into mature plants and describe how plants need water, light and a suitable temperature to grow and stay healthy. They are introduced to new scientific concepts such as habitats, life cycles, and food chains, which broaden their understanding of living things and their environments. As their confidence grows, pupils begin to carry out investigations with increasing independence, applying their enquiry skills more systematically. Their scientific vocabulary is further developed, enabling them to communicate ideas more clearly and precisely. This progression prepares pupils for Key Stage 2, where they will deepen their understanding of scientific processes and begin to think more analytically about the world around them.

## Lower Key Stage 2 (Years 3 and 4)

The principal focus of science teaching in lower key stage 2 is to enable pupils to broaden their scientific view of the world around them. They should do this through exploring, talking about, testing and developing ideas about everyday phenomena and the relationships between living things and familiar environments, and by beginning to develop their ideas about functions, relationships and

interactions. They should ask their own questions about what they observe and make some decisions about which types of scientific enquiry are likely to be the best ways of answering them, including observing changes over time, noticing patterns, grouping and classifying things, carrying out simple comparative and fair tests and finding things out using secondary sources of information. They should draw simple conclusions and use some scientific language, first, to talk about and, later, to write about what they have found out.

### Year 3

In Year 3, pupils deepen their scientific understanding by exploring more complex concepts across biology, chemistry, and physics. Key areas include plants, animals including humans, rocks, light, and forces and magnets. Building on from Year 2, pupils will identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers and explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant. They will explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. Pupils learn that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food. They will identify the different types of teeth in humans and their simple function. Pupils will begin to classify rocks and understand simple physical phenomena like light and magnetism. Pupils will be introduced to forces and will compare how things move on different surfaces and observe how magnets attract or repel each other and attract some materials and not others. They will use their previous learning on materials to compare and group together a variety of everyday materials based on whether they are attracted to a magnet. Working scientifically skills are further developed through planning investigations, making predictions, recording results, and drawing conclusions. This year builds on Key Stage 1 foundations and prepares pupils for more systematic enquiry and abstract scientific thinking in Year 4 and beyond.

### Year 4

In Year 4, pupils expand their scientific understanding through topics such as living things and their habitats, states of matter, sound, electricity, and animals including humans. Building on from Year 3, pupils will describe the simple functions of the basic parts of the digestive system in humans and identify that humans and some other animals have skeletons and muscles for support, protection and movement. Pupils will develop their previous understanding of food chains, identifying producers, predators and prey. They will develop their knowledge of animals, including humans, by recognising that living things can be grouped in a variety of ways, exploring and using classification keys to help group, identify and name a variety of living things in their local and wider environment. They will recognise that environments can change and that this can sometimes pose dangers to living things. Pupils will explore changes of state and will be introduced to the basics of electrical circuits and sound waves. Pupils refine their working scientifically skills by planning fair tests, making accurate observations, and drawing conclusions from results. This year builds on prior knowledge and prepares pupils for more abstract scientific concepts and systematic investigations in Upper Key Stage 2.

## Upper Key Stage 2 (Years 5 and 6)

The principal focus of science teaching in upper key stage 2 is to enable pupils to develop a deeper understanding of a wide range of scientific ideas. They should do this through exploring and talking about their ideas; asking their own questions about scientific phenomena; and analysing functions, relationships and interactions more systematically. At upper key stage 2, pupils should encounter more abstract ideas and begin to recognise how these ideas help them to understand and predict how the world operates. They should also begin to recognise that scientific ideas change and develop over time. They should select the most appropriate ways to answer science questions using different types of scientific enquiry, including observing changes over different periods of time, noticing patterns, grouping and classifying things, carrying out comparative and fair tests and finding things out using a wide range of secondary sources of information. Pupils should draw conclusions based on their data and observations, use evidence to justify their ideas, and use their scientific knowledge and understanding to explain their findings.

### Year 5

In Year 5, pupils explore more advanced scientific concepts across biology, chemistry, and physics, including forces, Earth and space, properties and changes of materials, and the human life cycle. Building on previous learning about forces in Year 3, pupils will investigate gravity, air resistance and the movement of celestial bodies, and identify the effects of air resistance, water resistance and friction that act between moving surfaces. Pupils will investigate mechanisms, including levers, pulleys and gears. They will also learn about separating mixtures, and reversible and irreversible changes in materials, drawing on their previous learning about materials. Pupils will further develop their understanding of animals, including humans, by describing the differences in the life cycles of a mammal, an amphibian, an insect and a bird and describe the changes as humans develop to old age. They will describe the life process of reproduction in some plants and animals. Pupils refine their working scientifically skills by planning more complex investigations, recording data systematically, and drawing evidence-based conclusions. This year builds on prior learning and prepares pupils for the increased depth and independence required in Year 6 and Upper Key Stage 2.

### Year 6

In Year 6, pupils consolidate and extend their scientific understanding through topics such as evolution and inheritance, light, electricity, living things and their habitats, and animals including humans. Building on from their understanding of light in Year 3, pupils learn that light travels in straight lines, how the eye sees things, and investigate shadows. Previous learning in Year 4 on electricity will enable pupils to associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit and they use recognised symbols when representing a simple circuit in a diagram. Children will recall learning about rocks in Year 3 to recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago. They explore more abstract concepts like adaptation, classification, and the circulatory system, while refining their ability to plan investigations, control variables, and interpret data. Pupils apply their scientific knowledge with increasing independence and precision, preparing them for the demands of secondary science by developing analytical thinking and a deeper understanding of scientific enquiry.

| | Autumn | Spring | Summer |
|---|---|---|---|
| **Year 1** | Use of everyday Materials<br>Seasonal changes | Plants<br>Seasonal changes | Animals including humans<br>Seasonal changes |
| **Year 2** | Use of everyday materials | Animals including humans<br>Plants | Living things and their habitats |
| **Year 3** | Rocks<br>Light | Animals including humans<br>Forces and magnets | Plants |
| **Year 4** | Animals including humans<br>States of matter | Electricity<br>Sound | Living things and their habitats |
| **Year 5** | Forces<br>Earth and space | Properties and changes of materials | Living things and their habitats<br>Animals including humans |
| **Year 6** | Light<br>Electricity | Animals including humans<br>Evolution and inheritance | Living things and their habitats |

## Monitoring and Assessment

Assessment plays a vital role in ensuring our science curriculum remains ambitious and inclusive. It enables teachers to check pupils' understanding, identify gaps in learning, and make informed adaptations to teaching so that all children can make sustained progress. Assessment is ongoing and takes various forms throughout each unit. Techniques such as self-assessment, peer assessment, and teacher observation are used in line with the specific learning outcomes. Much of this formative assessment occurs naturally within lessons and may not always be formally recorded.

For each unit of study, pupils are assessed against the expected objectives for both knowledge and skills. At the end of each unit, teachers make a summative judgment of each pupil's attainment, recording whether they are working below or at the expected standard in relation to the unit's objectives. This information informs future planning and supports targeted intervention where needed. By the end of the academic year, teachers determine whether pupils have met or not met the expected standards in each area.

By the end of each key stage, pupils are expected to know, apply and understand the matters, skills and processes specified in the relevant National Curriculum programme of study.

Monitoring of science teaching and learning is carried out regularly and takes multiple forms. This includes:

- Pupil voice activities conducted at least twice a year to gather feedback on engagement and understanding;
- Work scrutiny, involving the analysis of pupils' recorded work and other evidence sources to evaluate progress and curriculum coverage;
- Planning reviews and lesson observations to ensure consistency and quality across year gro