



# St Michael's CE Primary School, Sandhurst

## Subject Vision Document: Science

### Vision (Intent)

Science stimulates and excites pupils' curiosity about natural phenomena and events in the world around them. It also satisfies their curiosity with knowledge. At St Michael's this body of knowledge will be built up through the experimental testing of ideas including the study of existing evidence. Scientific method is about developing and evaluating explanations through experimental evidence and modelling. Through our Science, pupils understand how major scientific ideas contribute toward technological change – impacting on industry, medicine, business and improving quality of life. They learn to question and discuss science based issues that may affect their own lives, the directions of society and the future of the world. Through our teaching of Science, it will also promote collaborative activity where ideas and suggestions are shared and investigated together.

### Our aims:

- Preparing our children for life in an increasingly scientific and technological world.
- Fostering concern about, and active care for, our environment.
- Helping our children acquire a growing understanding of scientific ideas.
- Enable pupils to question, hypothesize, test and discover for themselves about our world.
- Developing the skills of investigation - including observing, measuring, predicting, hypothesising, experimenting, communicating, interpreting, explaining and evaluating.
- Developing the use of scientific language, recording and techniques.
- Developing the use of ICT in investigating and recording.
- Enabling our children to become effective communicators of scientific ideas, facts and data.

### We seek to ensure that our children:

- Develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics
- Develop understanding of the nature, processes and methods of science through different types of science enquiries that help them to answer scientific questions about the world around them
- Are equipped with the scientific knowledge required to understand the uses and implications of science, today and for the future

### Curriculum (Implementation)

Planning for science is a process in which all teachers are involved to ensure that the school gives full coverage of the National Curriculum programmes of study for Science and 'Understanding of the World' in the Early Years Foundation Stage. Science teaching in the school is about excellence and enjoyment and where possible is cross-curricular so it is integrated into our wider curriculum being taught that term to provide a more contextual and meaningful experience.

### Curriculum Structure

The areas of study are outlined by the National Curriculum and these have been divided and allocated to Year groups through the WhiteRose Science Scheme, with specific content to cover. The White Rose Science curriculum meticulously maps out the progression of both scientific knowledge and working scientifically skills (substantive and disciplinary knowledge) throughout the academic year. This strategic alignment ensures that the knowledge and skills are tailored to each year group, and the small-step approach guarantees sufficient coverage and time for effective teaching and consolidation of these essential skills. Each small-step is

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accompanied by a National Curriculum link, indicating the covered substantive knowledge and the disciplinary skill.

Each year group features two sustainability blocks which are linked to the preceding blocks, providing a real-life, relevant context to their learning. These sustainability blocks are designed to foster children's understanding of current issues related to sustainability and climate change. We feel that this offers children a valuable opportunity to recognise their role in shaping a more sustainable future. They also aim to deepen children's understanding of how they can actively contribute to positive changes in both their local and wider environments.

The school ensures that a broad and balanced science curriculum is followed in which enquiry is at the heart of our children's scientific learning

### Lesson Delivery (Pedagogy)

#### Science in Ducklings (EYFS)

Play underpins the delivery of all the EYFS. In playing, children behave in different ways: sometimes within their play, they may describe and discuss what they are doing and sometimes they may be more reflective and quiet as they play. Within a secure and challenging environment with effective support, children can explore, develop and experiment as they play to help them make sense of the world. The EYFS strand 'Understanding the World' leads directly to scientific elements of the curriculum and leads to more formalised Science learning in KS1 and then KS2.

#### Key Stage One

During Key Stage one, pupils observe, explore and ask questions about living things, materials and the world around them. They begin to work together to collect evidence to help them answer questions, find patterns, classify and group objects, research using a variety of sources, observe changes in their environment over time and carry out fair testing. Pupils use reference materials to find out more about scientific ideas. They share their ideas and communicate them using scientific language, drawings, charts and tables. Science lessons in Key Stage one are either taught discretely or where possible connected to other curriculum areas. Pupils often use their outdoor areas and garden in their science learning.

As Science is a core subject, in KS1 and Foundation stage teachers teach science for a minimum of one hour each week. With the focus on promoting their creativity and investigating the world around them, in KS1 and Foundation stage, a minimum of one third of lessons overall include one of the branches of practical scientific enquiry with a focus on one of the skills such as recording results.

#### Key Stage Two

Children are encouraged to extend the scientific questions that they ask and answer about the world around them. Pupils carry out a range of scientific enquiries including: observations over time, pattern seeking, classifying, grouping and researching using other sources (including computing resources when possible). Children in Key Stage Two learn to plan science investigations by only changing one variable to make it a fair test. Pupils in Key Stage two extend their scientific learning using the outdoor areas. They share their ideas and communicate them using scientific language specific to the topic (supported by the vocabulary mats, in some classes, that correspond to their year groups for each topic), diagrams, charts, tables and computerised graphing. Pupils often use their outdoor areas and garden in their science learning.

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**Community**

**Compassion**

**Creativity**

**Courage**



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In KS2, teachers aim for a minimum of one afternoon of Science a week in which a minimum of 50% of overall lessons include one aspect of practical scientific enquiry (listed above) that focuses on a specific skill such as drawing upon their results to make simple conclusions.

### **Cross-curricular Science Opportunities**

Teachers will seek to take advantage of opportunities to make cross-curricular links. They will plan for pupils to practise and apply the skills, knowledge and understanding acquired through Science lessons to other areas of the curriculum:

Sharing strong links with mathematics – taking measurements (length, time, mass, etc), data handling and presenting data in tables and through the use of graphs and pie charts.

Computing - We recognise the important role computing skills have to play in the development of scientific skills. We also recognise the importance of being computer literate. Computing skills are used to enhance teaching and learning of science and to give all children the opportunity to use computing to research, collect, analyse and present scientific findings. This includes the use of data loggers and microscopes.

Geography shares a 'natural' link with Science and pupils should have every possible opportunity to explore the science present in and around their school environment.

To bring in History, children should have the opportunity to research and learn about famous scientists from history and how their achievements have changed or impacted upon our lives – this is particularly relevant in our wider curriculum topics that have a Science focus.

### **Assessment**

We use assessment to inform and develop our teaching.

Topics begin with an assessment of what children already know using activities such as: asking a big question, concept cartoon, grouping or classifying a set of objects/cards, a KWL (what I wonder, what I know, what I learnt), true or false statements, mind maps/word webs etc. which are evidenced in planning or books

We assess for learning (AfL) throughout the topic. Activities during, and at the end of, each topic record achievement and celebrate success. Types of activities can include reasoning question stems or revisiting pre topic activities:

- Which one is the odd one out?
- Always, sometimes, never
- True or False – why?
- Give another, another and another. (Different examples)
- Convince me
- Would you rather
- What's the same? What's different?

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- What is the question if ..... is the answer.
- What do you notice?

Science work, where appropriate, will be recorded in science books; evidence will also be photographic or written on post-its and evident on classroom displays.

We have a tracking system to follow children's progress. The school science coordinator monitors progress through the school by sampling children's work at regular intervals. Children who are not succeeding, or children who demonstrate high ability in science, are identified and supported.

### **Outcomes (Impact – how do we measure and evaluate)**

The successful approach at St Michael's results in a fun, engaging, high-quality science education that provides children with the foundations and knowledge for understanding the world. Our children love Science!

Children will know more, remember more and understand more about the curriculum. Children retain prior-learning and explicitly make connections between what they have previously learned and what they are currently learning.

All children will have:

- A wider variety of skills linked to both scientific knowledge and understanding, and scientific enquiry/investigative skills
- A richer vocabulary which will enable them to articulate their understanding of taught concepts
- Confidence and a love of learning for all things science

### **Curriculum Enhancement**

The Science Curriculum is further enhanced by providing regular opportunities real life science through visitors who work in the science world. Enrichment days also provide a challenging and fun day for pupils to apply their Science skills to develop their skills learnt during Science lessons.

### **Partnerships**

- The Keys Academy Trust

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