

Curriculum Intent - Science

Our Vision & Rationale

Characteristics of an effective learner and a successful scientist

Our vision is to give children a science curriculum that enables them to explore and discover the world around them. We aim to provide opportunities to nurture children's curiosity through an inquiry-based curriculum that promotes exploration and investigation. Our aim is that these learning opportunities will help children secure and extend their skills and knowledge while encouraging a lifelong interest in science.

The understanding of key ideas in science is built on across the key stages and a progression of skills allows pupils to move from early observations and exploration, to considered questioning and drawing out of ideas. Strategies to allow pupils to show their deeper understanding of key scientific ideas include; making observations, asking questions, planning their own investigations, producing annotated drawings, drawing scientific conclusions and developing their skills as young scientists.

An effective scientist:

Is curious about the world around them and asks questions that require investigation	Draws on prior knowledge to understand the world & make connections and predictions	Has the skills to carry out all aspects of an investigation	Works systematically and with increasing precision	Can draw together evidence to make conclusions and use this to ask further questions
These learning behaviours are particularly helpful in becoming an effective scientist:				
				

Purpose of study

A high-quality science education provides the foundations for understanding the world through the specific disciplines of biology, chemistry and physics. Science has changed our lives and is vital to the world's future prosperity, and all pupils should be taught essential aspects of the knowledge, methods, processes and uses of science. Through building up a body of key foundational knowledge and concepts, pupils should be encouraged to recognise the power of rational explanation and develop a sense of excitement and curiosity about natural phenomena. They should be encouraged to understand how science can be used to explain what is occurring, predict how things will behave, and analyse causes.

Aims

The national curriculum for science aims to ensure that all pupils:

- 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.

Scientific Knowledge and conceptual understanding

The programmes of study describe a sequence of knowledge and concepts. While it is important that pupils make progress, it is also vitally important that they develop a secure understanding of each key block of knowledge and concepts in order to progress to the next stage.

Pupils should be able to describe associated processes and key characteristics in common language, but they should also be familiar with, and use, technical terminology accurately and precisely. They should build up an extended specialist vocabulary. They should also apply their mathematical knowledge to their understanding of science, including collecting, presenting and analysing data. The social and economic implications of science are important but, generally, they are taught most appropriately within the wider school curriculum: teachers will use different contexts to maximise their pupils' engagement with and motivation to study science.

The nature, processes and methods of science

'Working scientifically' specifies the understanding of the nature, processes and methods of science for each year group. It should not be taught as a separate strand. The notes and guidance give examples of how 'working scientifically' might be embedded within the content of biology, chemistry and physics, focusing 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.

Attainment targets

By the end of each key stage, pupils are expected to know, apply and understand the matters, skills and processes specified in the relevant programme of study with every child assessed at the end of each topic.

SEND Provision - an inclusive curriculum

When planning and teaching lessons, teachers will consider how **all** children learn and provide a tailored Science curriculum to meet each individual child's needs. The child's needs are met by teachers considering the following SEND:

- **Specific Literacy difficulty** – could the child type? Use pictures to show their outcome,? An adult scribe? Scaffolding written work?
- **Auditory processing/memory needs** - Key word banks, visual task planners and chunking auditory input
- **Working Memory** – Keep the task practical and on the intended learning outcome, support reading and writing and adapt task accordingly, visuals structures may include; now and next visuals, success criteria, key words, concrete apparatus
- **Difficulties with vocabulary and or word finding** - pre-teaching and over learning of key vocabulary, multi-sensory approach, make semantic links between real experience and vocabulary teaching
- **Slower processing for visual/verbal information** - additional processing time, pace of the lesson and additional thinking time
- **Receptive language barriers** – refer to key vocabulary when teaching, draw on visual stimuli and sometimes adapt key instructions for individuals. Support staff adapt instructional/conceptual language for key groups of children
- **Barriers with numeracy skills** – use of technology, mixed ability pairings/groupings, scaffolding work (bar graphs, line graphs, scatter graphs)

- **Social communication difficulties/Autism** - individual workspaces, working with an adult 1:1/ in a pair/ mixed groupings, Sensory diet provision, visual planners, social stories and comic strip conversations, use of Zones of Regulation
- **Social emotional needs (motivation, low sense of self, needs around attention, concentration and self-regulation)** – visual support, wobble cushions, sensory tools and ear defenders use

Inclusion and Diversity

At St.Mark's, we strive to build a culture in science where difference is valued and is part of what makes science inspiring. We highlight the scientists who have contributed to significant discoveries from the past and continue to take opportunities to ensure that these scientists are from a range of backgrounds and cultures including women, Black, Asian and minority ethnic (BAME). We encourage the children to challenge stereotypes and seek to raise the aspirations of children by highlighting careers in science and the STEM subjects.