Southam St James CofE Academy

Science Curriculum Intent

Intent

'Let your light shine' Our vision for our community is for everyone, children, and adults, to flourish and shine brightly as the best and fullest version of their unique selves. We aim high and do not let circumstances limit us. 'I will shine. We will shine as, together, we grow in wisdom, learning from the teachings of Jesus, to serve our community.' Our science curriculum has been designed to allow children to let their light shine as scientists.

Teaching and learning in science make a significant contribution to our curriculum vision for Southam St James. The skills and habits of scientists are founded on observation, critical thinking, and evaluation. Scientists notice, reflect and revisit; they show perseverance in their pursuit of accuracy, and they apply their knowledge precisely and with care. They show imagination in going beyond what is currently known and understood to broaden human appreciation of the world, opening up opportunities in theoretical science as well as applied fields such as medicine, engineering, and technology that enable us to tackle and resolve the challenges of the modern world. Science offers an exciting field in which children can broaden their horizons and explore new ideas. It is also a field where future boundaries are unknown, so that children have the opportunity to contribute in the future in a way that may not yet be understood.

Our vision is that all children will develop:

- the skills of scientific enquiry (what it means to be 'a scientist'): enquiring, exploring, predicting, observing precisely, measuring, and evaluating to be able to ask and respond confidently to questions about the natural and physical world;
- a secure understanding of foundational concepts and knowledge in Science, recognising the significance of rational explanation, evidence and causation in understanding the world and the challenges we face (and developing a justified capacity for identifying and rejecting 'fake news' relating to Science);
- a lively sense of curiosity, enabling them to appreciate and understand how scientists have changed our understanding of the world through the developing disciplines of Biology, Chemistry and Physics, and to begin to consider where Scientific enquiry and its application might develop in the future.

At Southam St James we inspire children to be curious, resilient, creative and critical scientists, equipped with the scientific skills and understanding of scientific methods to formulate and investigate scientific questions successfully, will be founded on their successful study of the following aspects of scientific study (and progression towards the endpoints below by the end of Year 6):

- **Working scientifically**: the skills and methods of scientific enquiry.
- **Scientific knowledge and conceptual understanding**: foundational knowledge and key concepts in the fields of biology, chemistry and physics.
- **Inspiration and ambition: Science in the world** - understanding of great discoveries, contemporary challenges, and opportunities in scientific research and

employment.

Working Scientifically: the skills and methods of scientific enquiry.

Children at Southam St James will have the opportunity to learn and apply the skills of scientific enquiry progressively and in a variety of contexts, revisiting and developing skills throughout their programme of study. As they progress through Southam St James, they will be able to exercise increasing autonomy in the formulation of scientific questions, the nature and extent of prior research they undertake to inform their investigations, the selection and use of scientific equipment, and the way in which they record, interpret and present their findings.

By the time children reach Year 6, they will have a confident understanding of how to conduct an effective scientific investigation, choosing and using appropriate scientific equipment safely and with precision. They will be curious about scientific problems and questions they encounter, motivated to ask why, and reflect on efficient modes of enquiry. They will also have had experience of conducting investigations that can be applied in real life contexts to address challenges facing the modern world and of reporting their findings with attention to their audience.

When planning and conducting scientific investigations, children will acquire and develop the following broad skills:

- Use scientific knowledge and understanding to formulate questions and make informed predictions;
- Identify appropriate scientific equipment and use it safely and with accuracy;
- Understand how to construct an investigation based on careful identification of variables, and efficient and accurate application of objective scientific methods (e.g. 'fair testing');
- Observe carefully and record observations accurately (e.g. in tables and in written reports)
- Evaluate results and reflect critically on causation and accuracy (e.g. considering whether findings are valid, accurate and could be reproduced by others);
- Interpret findings and draw conclusions that are relevant to the original enquiry;
- Be able to present findings in a variety of ways and know when and how to select between different approaches to ensure the presentation is most effective for the scientific purpose/challenge and audience.

Implementation

At Southam St James we want children to enjoy science and to develop their natural enthusiasm and curiosity in all lessons. Children will have opportunities to retrieve and embed prior knowledge in order to enhance their confidence with core concepts. This may be rehearsed orally, recapping prior learning, or may include quizzes and other retrieval exercises as children progress through Key Stage 2. Knowledge organisers will support children to recognise and recall core concepts and vocabulary. Key areas of knowledge are taught with the support of demonstrations, film and images, diagrams, and research as well as shorter teacher-led enquiries and activities. In addition, children undertake more extended investigations.

Our non-fiction library hub has many age-appropriate science texts including several engaging picture books to inspire children to undertake scientific enquiry. Children can select from these texts as part of their 'Reading for Pleasure' sessions as well as to support research in science. As children progress through school, they will also develop their confidence to research and evaluate evidence gathered online.

In each class, displays will support children's learning in the topics they are studying, presenting key vocabulary, concepts and questions to be investigated, as well as information about famous scientists where appropriate. Teachers will also provide appropriate models to support children in developing scientific skills including presentation of their work. These displays will provide a reference point for children and will also develop with them as they progress through each unit.

Whilst the primary focus of scientific enquiry is to develop the skills and knowledge that equip children to develop a life-long interest in science, we also recognise that mathematical, literacy and oracy skills are also vital for a scientist to be effective. Children will have many opportunities to apply their mathematical skills (especially those gained in data handling and statistics) as well as apply reading and writing skills (e.g. in research, when recording observations and when writing up reports). Oracy skills are practised in peer and class discussion as well as when presenting scientific conclusions and children are taught to consider the purpose and audience for which they are undertaking an investigation.

Effective teaching of science not only provides children with access to a vibrant academic discipline that is intellectually stimulating and enjoyable, it also promotes curiosity, observation, resilience, and effective communication. In addition, scientific understanding contributes significantly to the 'cultural capital' children need to become confident, reflective citizens.

In Early Years children begin to develop an understanding of what science is, on developing the skills of looking closely, and on the language needed to describe what we see. Children are encouraged to explore the natural world around them, making observations and drawing pictures of animals and plants. Learn about some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class. They will also develop an Understanding some important processes and changes in the natural world around them, including the seasons and changing states of matter.

Children with SEND have access to a broad and balanced curriculum and scaffolding is used to support children in their learning in line with the EEF recommendations. Where required pre teach is also used to expose children to content prior to it being taught this may include vocabulary teaching in order that those pupils can access the lesson.

Enrichment opportunities are offered in the form of visits, visitors. They provide opportunities for children to broaden their experiences and deepen their learning. They spark interest and are a motivating factor for children.

Impact

Following a unit of work a multiple - choice quiz is undertaken so that children are able to demonstrate their ability to know more and remember more. For some units of work children produce an extended piece of writing in the form of an essay to demonstrate knowledge and understanding.

Monitoring is carried out with staff as a collaborative and developmental approach. A variety of methods are used to quality assure the quality of provision in science and information is triangulated to provide a well-developed evaluation.

- Learning walks/pop ins.

- Pupil voice
- Book looks
- Pupil progress meetings.
- Learning environment checks.

The school's assessment system Insight is used to track progress in key learning