



Read St. John's Science Policy

'Sowing the Seeds of tomorrow; growing in the light of the Lord'

At Read St. John's we aim to unlock the potential for everyone to flourish whilst being rooted and grounded in God's love. We aim high, so together as one family, we can fly.

Intent

At Read St. John's, science enables pupils to be inquisitive and foster a healthy curiosity and a sense of awe in the natural world and our universe. Through scientific research and exploration, we develop children's enjoyment and interest in science and an appreciation of its contribution to all aspects of everyday life. We ensure that the Working Scientifically skills are built-on and developed throughout children's time at the school so that they can apply their knowledge of science when using equipment, conducting experiments, building arguments and explaining concepts confidently whilst continuing to ask questions about their surroundings. We extend the learning environment for our children via our local and immediate environments and links to the local community conservationists. We promote respect and a deeper understanding of 'healthy lifestyle' for themselves and others. We develop a greater understanding of the concepts and knowledge of science giving them the skills to carry out accurate and purposeful investigations using scientific language.

Implementation

At Read St. John's we base all our Science planning on the National curriculum attainment targets using scientific language. At Read St. John's we use the Pzaz scheme of work alongside the Lancashire themed booklets as the basis for our planning. This enables us to make cross curricular links when possible. A progressive scheme of learning is provided in our separate science skills progression document and topic map. This is based on the National Curriculum and is designed to enhance and deepen children's learning as they progress through school.

Teachers create a positive attitude to science learning within their classrooms and reinforce an expectation that all children are capable of achieving high standards in science. Our whole school approach to the teaching and learning of science involves the following;

- Through our planning, we involve problem solving opportunities that allow children to find out for themselves. Children are encouraged to ask their own questions and be given

opportunities to use their scientific skills and research to discover the answers. This curiosity is celebrated within the classroom. Planning involves teachers creating engaging lessons, often involving high-quality resources to aid understanding of conceptual knowledge. Teachers use precise questioning in class to test conceptual knowledge and skills and assess children regularly to identify those children with gaps in learning, so that all children keep up.

- We build upon the learning and skill development of the previous years. As the children's knowledge and understanding increases, and they become more proficient in selecting, using scientific equipment, collating and interpreting results, they become increasingly confident in their growing ability to come to conclusions based on real evidence.
- Working Scientifically skills are embedded into lessons to ensure these skills are being developed throughout the children's school career and new vocabulary and challenging concepts are introduced through direct teaching. This is developed through the years, in-keeping with the topics.
- Teachers demonstrate how to use scientific equipment, and the various Working Scientifically skills in order to embed scientific understanding. Teachers find opportunities to develop children's understanding of their surroundings by accessing outdoor learning and workshops with experts.
- Children are offered a wide range of extra-curricular activities, visits, trips and visitors to complement and broaden the curriculum. These are purposeful and link with the knowledge being taught in class.
- We use a variety of teaching and learning styles in science lessons. Our principal aim is to develop children's knowledge, skills, and understanding. Sometimes, we do this through whole-class teaching, while at other times, we engage the children in an enquiry-based research activity. We encourage the children to ask, as well as answer, scientific questions. They have the opportunity to use a variety of data, such as statistics, graphs, pictures and photographs. They use ICT in science lessons because it enhances their learning. They take part in role-play and discussions, and they present reports to the rest of the class. They engage in a wide variety of problem-solving activities. Wherever possible, we involve the children in real scientific activities, e.g. investigating a local environmental problem, or carrying out a practical experiment and analysing the results. We involve real life contexts for science, where children are investigating scientific question with a real purpose in mind, appropriately linked to the creative curriculum topic.

EYFS Curriculum

In Reception, children are given the opportunity to learn about similarities and differences in relation to places, objects, materials and living things; to talk about the features of their own immediate environment and how environments might vary from one to another; make observations of animals and plants and explain why some things occur, and talk about changes.

KS1

The principal focus of science teaching in key stage 1 is to enable children 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.

The principal focus of science teaching in lower key stage 2 is to enable children 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. The children should be able to read and use scientific vocabulary.

The principal focus of science teaching in upper key stage 2 is to enable children 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, they 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. The children 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. They should expand their scientific vocabulary and use it in the appropriate context.

Spiritual, moral, social and cultural development

Spiritual development: Science is using evidence to make sense of the world. It has the ability to make us feel both enormously insignificant (compared to the scale of the visible universe) and enormously significant (we are genetically unique). It helps us understand our relationship with the world around us (how the physical world behaves, the interdependence of all living things). Making new discoveries increases our sense of awe and wonder at the complexities and elegance of the natural world. For scientists, this is a spiritual experience and drives us onwards in our search for understanding.

Moral development: Whether it's the ethics behind certain medical treatments, the environmental impact of industry, or how government funding is allocated to scientific projects; moral decisions are an important aspect of Science. Scientific discoveries and inventions need to be used responsibly, and decisions made based on evidence (not prejudice). As teachers, we encourage pupils to be both open minded (generating a hypothesis) and critical (demanding evidence) and to use their understanding of the world around them in a positive manner.

Social development: Scientists are collaborators. Sharing ideas, data, and results (for further testing and development by others) is a key principle of the scientific method. We encourage pupils to work together on scientific investigations and to share results (to improve reliability). Science has a major impact on the quality of our lives. In Science lessons, pupils consider the social impact (both positive and negative) of science and technology.

Cultural development: Science permeates modern culture and has played a key part in developing it. It is (both currently and historically) an international activity. In Science lessons, we explore and celebrate research and developments that take place in many different cultures, both past and present. We explore how scientific discoveries have shaped the, beliefs, cultures and politics of the modern world.

Assessment, Monitoring and Moderation

Teachers will assess children's work in science by making informal judgements during lessons. On completion of a piece of work, the teacher assesses it, and uses this assessment to plan for future learning. Written or verbal feedback is given to the child to help guide his/her progress. Older children are encouraged to make judgements about how they can improve their own work.

Throughout the school teachers will assess whether children are working below, just below, on track or at greater depth for their age based on their understanding and application of the content of the National Curriculum 2014. Progress and attainment is reported to parents through parents' evenings and end of year reports.

Monitoring and moderation takes place regularly through:

- Monitoring of planning
- Learning Walks
- Observations
- Scrutiny of Books/Work
- Moderation of work
- Discussions with Children/Pupil Voice Questionnaires
- Staff Meetings and Staff Audits
- Meetings/observations with the nominated governor.

Health and Safety

The children will be taught to use scientific equipment safely when using it during practical activities. Class Teachers and Teaching Assistants will check equipment regularly and report any damage, taking defective equipment out of action. In planning, the class teacher is expected to assess the risks and adjust their lessons accordingly to ensure safe practice and appropriate levels of supervision.

Resources

We have sufficient resources for all science teaching units in the school. We keep these in a central store. Teachers are to make sure that they have the correct equipment and speak to the subject leader if require any more.

Impact

Most children will achieve age related expectations in Science at the end of their cohort year.

- Children will retain knowledge that is pertinent to Science with a real life context.
- Children will be able to question ideas and reflect on knowledge.
- Children will work collaboratively and practically to investigate and experiment.
- Children will be able to explain the process they have taken and be able to reason scientifically.

The overall impact is demonstrated through the children's learning outcomes by the end of KS2. They:

- 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.

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