



Science Policy

At Fringford C of E Primary School, we recognise that a high quality science education provides pupils with the foundations for understanding the world around them. Science has changed our lives and is vital to the world's future prosperity, and all pupils are taught essential aspects of the knowledge, methods, processes and uses of science. Pupils are encouraged to recognise the power of rational explanation and develop a sense of excitement and curiosity about natural phenomena. Through a series of carefully planned steps, pupils build up a body of essential knowledge and skills that can be used to explain what is occurring, predict how things will behave, and analyse causes.

Intent

The aims of science are to enable children to:

- To develop scientific knowledge and conceptual understanding through the specific disciplines of Biology, Chemistry and Physics. Each scientific discipline gives pupils a unique perspective to explain the world around them.
- To 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.
- To be equipped with the scientific knowledge and skills required to understand the uses and implications of Science, today and for the future.
- To use a range of methods to communicate their scientific knowledge including ICT, diagrams, graphs, charts and reports.
- To develop a sense of excitement and curiosity about the world around them
- To ensure that the school's curriculum map involves repetitive teaching of the key concepts in Science. Each unit has built in practise, retrieval and reinforcement of the key concepts to ensure knowledge sticks in the long-term memory.

Implementation

- We implement a curriculum that is progressive throughout the whole school and gives full coverage of, 'The National Curriculum programmes of study for Science 2014.' The curriculum is planned to build increasingly knowledge of products and practices of science.
- Science is often taught as a thematic approach lending coherence to abstract concepts and complex vocabulary. Our curriculum is sequenced to ensure all learners are supported to learn scientific concepts.
- Pupils have time which is allocated to embed what they have learned in long-term memory through extensive practice before moving on to new content.
- The use of pre-unit tests ensures as pupils progress through the science curriculum, new knowledge gets systematically integrated into pre-existing knowledge and misconceptions are addressed.
- 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.
- The teaching of Science involves adapting and extending the curriculum to match all pupils' needs.
- Opportunities to learn about scientists and the way in which they engage in their working: through reading, talking, writing and representing science.

- Opportunities for practical investigation are planned for in every unit and Working Scientifically skills are embedded into lessons to ensure these skills are being developed throughout the children's school career. Working scientifically is further broken down into knowledge of methods that scientists use to answer questions; knowledge apparatus and techniques, including measurement; knowledge of data analysis; knowledge of how science evidence to develop explanations.
- 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 and using scientific equipment, collating and interpreting results, they become increasingly confident in their growing ability to come to conclusions based on real evidence.

Principles of teaching and learning

At Fringford Primary, Pzaz (online comprehensive scheme of work) is used and adapted throughout the school and ensures all lessons meet the full coverage of the National Curriculum. Lessons are adapted to ensure the needs of the children are met in every class.

The study of science is planned to give pupils a suitable range of differentiated activities appropriate to their age and abilities. Tasks will be set which challenge all pupils, including the more able. For pupils with SEN the task will be adjusted or pupils may be given extra support. The grouping of pupils for practical activities will take account of their strengths and weaknesses and ensure that all take an active part in the task and gain in confidence.

Pupils will be involved in a variety of structured activities and in more open-ended investigative work:

- Activities to develop good observational skills,
- Practical activities using measuring instruments which develop pupils' ability to read scales accurately,
- Structured activities to develop understanding of a scientific concept,
- Open ended investigations.

On some occasions pupils will carry out the whole investigative process themselves or in small groups.

Planning

We carry out our curriculum planning in science in three phases (long-term, medium-term and short-term). The long-term plan maps the scientific topics studied in each term during the key stage. The science subject leader works this out in conjunction with teaching colleagues in each year group. In some cases we combine the scientific study with work in other subject areas, especially at Key Stage 1; at other times the children study science as a separate subject.

As we have mixed-age classes, we do our medium-term planning on a two-year rotation cycle. In this way we ensure complete coverage of the National Curriculum without repeating topics.

The class teacher is responsible for writing the daily lesson plans for each lesson (short-term plans). These plans list the specific learning objectives of each lesson. The class teacher keeps these individual plans, and s/he and the science subject leader often discuss them on an informal basis.

We have planned the topics in science so that they build upon prior learning. We ensure that there are opportunities for children of all abilities to develop their skills and knowledge in each unit and we also build progression into the science scheme of work, so that the children are increasingly challenged as they move up through the school.

Science across the curriculum

English

Science contributes significantly to the teaching of English in our school by actively promoting the skills of reading, writing, speaking and listening. Some of the texts that the children study in the English are of a scientific nature. The children develop oral skills in science lessons through discussions (for example of the environment) and through recounting their observations of scientific experiments. They develop their writing skills through writing reports and projects and by recording information.

Mathematics

Science contributes to the teaching of mathematics in a number of ways. The children use weights and measures and learn to use and apply number. Through working on investigations they learn to estimate and predict. They develop the skills of accurate observation and recording of events. They use numbers in many of their answers and conclusions.

Information and communication technology (ICT)

Children use ICT in science lessons where appropriate. They use it to support their work in science by learning how to find, select, and analyse information on the Internet and other software packages. Children use ICT to record, present and interpret data and to review, modify and evaluate their work and improve its presentation.

Personal, social and health education (PSHE) and citizenship

Science makes a significant contribution to the teaching of personal, social and health education. This is mainly in two areas. Firstly, the subject matter lends itself to raising matters of citizenship and social welfare. Children benefit from the nature of the subject in that it gives them opportunities to take part in debates and discussions. They organize campaigns on matters of concern to them, such as helping the poor or disadvantaged. Science promotes the concept of positive citizenship.

Spiritual, moral, social and cultural development

Science teaching offers children many opportunities to examine some of the fundamental questions in life, for example, the evolution of living things and how the world was created. Through many of the amazing processes that affect living things, children develop a sense of awe and wonder regarding the nature of our world. Science raises many social and moral questions. Through the teaching of science, children have the opportunity to discuss, for example, the effects of smoking and the moral questions involved in this issue. We give them the chance to reflect on the way people care for the planet and how science can contribute to the way we manage the earth's resources. Science teaches children about the reasons why people are different and, by developing the children's knowledge and understanding of physical and environmental factors, it promotes respect for other people.

Teaching Science to children with SEND

At our school we teach science to all children, whatever their ability. Science forms part of the school curriculum policy to provide a broad, balanced and relevant education to all children. Through our science teaching we provide learning opportunities that enable all pupils to make progress. We do this by setting suitable learning challenges and responding to each child's different needs. Assessment against the National Curriculum allows us to consider each child's attainment and progress against expected levels.

When progress falls significantly outside the expected range, the child may have special educational needs. Our assessment process looks at a range of factors – classroom organisation, teaching materials, teaching style, differentiation – so that we can take some additional or different action to enable the child to learn more effectively. This ensures that our teaching is matched to the child's needs.

We enable pupils to have access to the full range of activities involved in learning science. Where children are to participate in activities outside the classroom, for example, a trip to a science museum, we carry out a risk assessment prior to the activity, to ensure that the activity is safe and appropriate for all pupils.

Health and safety

Pupils 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. A simple risk assessment will be carried out for all practical activities any perceived hazards will be reported to the Head who will determine the appropriateness of said activity.

Assessment for Learning, recording and reporting

Throughout the school teachers will assess whether children are working at/above or below the expected level 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.

Resources

We have sufficient resources for all science teaching units in the school. We keep these in a central store where there is a box of equipment for each unit of work. There is also a collection of science equipment which the children use to gather weather data. The library contains a good supply of science topic books and computer software to support children's individual research.

Monitoring and review

It is the responsibility of the science subject leader to monitor the standards of children's work and the quality of teaching in science. The science subject leader is also responsible for supporting colleagues in the teaching of science, for being informed about current developments in the subject and for providing a strategic lead and direction for the subject in the school.