

Science and STEM

Intent

At North Marston C of E School, an enriched science curriculum that provides opportunities for practical lessons on a weekly basis is key. Our curriculum aims to broaden the children's scientific view of the world around them, whilst promoting a love for enquiry and wanting to explore new things. The implementation and teaching of Science is structured around our Values, the National Curriculum and the Early Learning Goals (EYFS).

In science, we will inspire our children by giving them the opportunities to pursue their natural curiosity; promoting the experience of exploring and investigating scientific phenomena, in a range of contexts, to ensure a continually evolving knowledge and understanding of the world around them. In a safe environment, our children will be encouraged to ask questions, take risks, experiment, reflect, make and learn from mistakes; whereby they acquire and apply core skills which equip them for an ever-changing world.

As well as the full range of practical scientific enquiries, we will provide plenty of other strategies to engage the children in their science learning; Bright Ideas Time, drama, deep thinking time, problem-solving in various contexts, videos from web pages, etc. and make cross curricular links.

Implementation

Key stage 1

The principal focus of science teaching in key stage 1 is to enable pupils 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. Most of the learning about science should be done through the use of first-hand practical experiences, but there should also be some use of appropriate secondary sources, such as books, photographs and videos.

'Working scientifically' is described separately in the programme of study, but must always be taught through and clearly related to the teaching of substantive science content in the programme of study. Throughout the notes and guidance, examples show how scientific methods and skills might be linked to specific elements of the content.

Pupils should read and spell scientific vocabulary at a level consistent with their increasing word reading and spelling knowledge at key stage 1.

Lower key stage 2 – years 3-4

The principal focus of science teaching in lower key stage 2 is to enable pupils 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.

‘Working scientifically’ is described separately at the beginning of the programme of study, but must always be taught through and clearly related to substantive science content in the programme of study. Throughout the notes and guidance, examples show how scientific methods and skills might be linked to specific elements of the content. Pupils should read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge.

Upper key stage 2 – years 5-6

The principal focus of science teaching in upper key stage 2 is to enable pupils 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. Pupils 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.

‘Working and thinking scientifically’ is described separately at the beginning of the programme of study, but must always be taught through and clearly related to substantive science content in the programme of study. Throughout the notes and guidance, examples show how scientific methods and skills might be linked to specific elements of the content. Pupils should read, spell and pronounce scientific vocabulary correctly.

Assessment, Monitoring and Evaluating

Assessment for learning will be continuous throughout the planning, teaching and learning cycle underpinning teaching and learning in Science. However children are more formally assessed termly in KS1 and KS2 using a variety of methods:-

- Observing children at work, individually, in pairs, in a group, and in classes.
- Questioning, talking and listening to children
- Considering work/materials / investigations produced by children together with discussion about this with them.
- Working Scientifically investigation assessment with the teaching and termly focus of planning (autumn), collecting and presenting (spring) and finally evaluating (summer).
- An age related assessment is provided for parents on the annual report.

Impact

The impact of our curriculum is that by the end of each topic, the vast majority of pupils will have sustained mastery of the content, that is, they remember it all and are fluent in it; some pupils have a greater depth of understanding.

By using the Thinking, Doing, Talking Science approach this will lead to increased engagement & achievement:

- More questioning
- Deeper thinking

- More discussion
- Less writing
- More practical activity

Pupils' attainment increases, pupils' enjoyment increases and teacher's enjoyment increases.

The children have a 'buzz' about science, they are very confident to express opinions, speculate and give justifications as to why they think as they do. They find science a lot more fun, it's far more interactive, conversational and they say it's fun! The pupils have more enthusiasm, deeper understanding and higher order thinking. The less able children are better engaged with their science learning and able to explore concepts practically.