



Intention

Science is a body of knowledge build up through experimental testing of ideas. Science is also a methodology, a practical way of finding reliable answers to questions we may ask about the world around us. Science in our school is about developing children's ideas and ways of working that enable them to make sense of the world in which they live through investigation, as well as using and applying process skills

We believe that a broad and balanced science education is the entitlement of all children, regardless of their ethnicity, culture, religion, home language, background, ability or gender.

In Teaching Science we Aim to:

- Prepare our children for life in an increasingly scientific and technological world.
- Foster concern about, and active care for, our environment.
- Help our children acquire a growing understanding of scientific ideas.
- Help develop and extend our children's scientific concept of their world.
- Develop our children's understanding of the international and collaborative nature of science.

Attitudes:

- Encouraging the development of positive attitudes to science.
- Building on our children's natural curiosity and developing a scientific approach to problems.
- Encouraging open-mindedness, self-assessment, perseverance and responsibility.
- Building our children's self-confidence to enable them to work independently.
- Developing our children's social skills to work co-operatively with others.
- Providing our children with an enjoyable experience of science, so that they will develop a deep and lasting interest and may be motivated to study science further.

Skills:

- Giving our children an understanding of scientific processes.
- Helping our children to acquire practical scientific skills.
- Developing the skills of investigation – including observing, measuring, predicting, hypothesising, experimenting, researching, communicating, interpreting, explaining and evaluating.
- Developing the use of scientific language, recording and techniques.
- Developing the use of technology in investigating, researching and recording.
- Enabling our children to become effective communicators of scientific ideas, facts and data.

Implementation

We use a variety of teaching and learning styles in science lessons, teaching science in ways that are imaginative, purposeful, well-managed and enjoyable. Teachers give clear and accurate explanations and extend learning through skilful questioning. We encourage the children to ask and answer their own scientific questions. They take part in role-play and discussions, and present reports to the rest of the class. They engage in a

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wide variety of problem-solving activities. They use secondary sources to research ideas and begin to separate opinion from fact.

We recognise that in all classes children have a wide range of abilities, and we ensure that we provide suitable learning opportunities for all children by matching the challenge of the task to the ability of the child. We achieve this in a variety of ways:

- Setting tasks which are open-ended and can have a variety of responses;
- Setting tasks of increasing difficulty (we do not expect all children to complete all tasks)
- Grouping children by ability, and setting different tasks for different abilities;
- Providing resources of different complexities, matched to the ability of the child;
- Using Learning Support staff to support the work on individual children or groups of children.

Science curriculum planning

Science is a core subject in the National Curriculum

(<https://www.gov.uk/government/publications/national-curriculum-in-england-science-programmes-of-study/national-curriculum-in-england-science-programmes-of-study>) and the national scheme of work for science is used as the basis for planning. The national curriculum provides the foundations for understanding the world through the scientific disciplines of biology, chemistry and physics. There are four areas of learning in the programme of study for each year in Key Stage 1, and five areas of learning each year in lower and upper Key Stage 2.

In addition to these knowledge based areas of learning, practical scientific methods, processes and skills are taught through the teaching of the programme of study content. These skills are detailed through the 'Working Scientifically' part of the programme of study, and are not taught as a separate strand. Different ways of working scientifically will include:

- Observing over time
- Identifying and classifying
- Pattern seeking
- Research using secondary sources
- Fair testing

It has been decided to supplement the national curriculum by teaching more physics based content in Key Stage 1. The rationale for this is:

To provide young children with practical experiences of physics based phenomena, which will stand them in good stead for learning physics knowledge and explanations of processes in Key Stage 2.

To increase opportunities for fair testing, children raising their own questions to investigate, and working independently in practical work.

To attempt to interest all children, especially girls, in careers based in physics and engineering.

We use a commercial scheme, Pearson's 'Science Bug' and have adapted it to our circumstances and needs. We can allocate science-based games and activities to each child's activelearnprimary website account, which can then be accessed from home.

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At times science work fits into the class' Creative Curriculum topic and is taught as part of that topic. At other times it is more appropriate to teach science as a discrete subject.

A number of our parents are STEM Ambassadors (Science, Technology, Engineering and Maths) <https://www.allaboutstem.co.uk/stemnet/>. Through their visits to the school, and through visits by other STEM Ambassadors, we aim to show our children the relevance of science to the 'real world' and to encourage our children to consider careers in the STEM subjects.

We are fortunate to have a member of staff who is trained in Forest Schools. She works with members of the teaching staff to plan and provide opportunities for children to take their learning outdoors, and to make use of 'Barry's Back Garden' our amazing wild garden resource.

We aim to create regular opportunities for extra-curricular, enjoyable, hands-on science activities. Family STEM challenges provide opportunities for different generations to work together to solve problems, test and refine solutions and enjoy collaboration and competition.

Early Years Foundation Stage

We teach science in nursery and reception classes as an integral part of the topic work covered during the year, and a number of topics are science led, for example 'Mini beasts and habitats' and 'Growing and changing'. We use Development Matters to underpin curriculum planning in EYFS

At the end of their Reception Year teachers report on each child's progress in regard to the Early Learning Goals.

From September 2020 this is:

Early Learning Goal, The Natural World: 'Children at the expected level of development will:

- Explore the natural world around them, making observations and drawing pictures of animals and plants;
- Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class;
- Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.

Science makes a significant contribution to the development of Characteristics of Effective Learning:

- Playing and Exploring – engagement
- Finding out and exploring
- Playing with what they know
- Being willing to 'have a go'
- Active Learning- motivation
- Being involved and concentrating
- Keeping trying
- Enjoying achieving what they set out to do
- Creating and Thinking Critically-thinking
- Having their own ideas

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- Making links
- Choosing ways to do things

The Contribution of Science to Teaching in Other Curriculum Areas

English

Science contributes significantly to the teaching of English by actively promoting the skills of reading, writing, speaking and listening. Some of the texts studied in English are of a scientific nature. Children's comprehension skills are developed and they learn to distinguish fact from opinion. They develop oral skills through discussions and through recounting their observations of practical work. They develop writing skills through report writing and recording information in different formats. They extend their vocabulary, learning the meaning of, and correctly using, new scientific vocabulary.

Mathematics

When children perform measurements they learn to use and apply number. They learn to estimate and make predictions, apply data-handling techniques and use different ways of presenting results graphically.

Design and Technology

Knowledge gained from science lessons is applied practically in Design and Technology, for example when children in Year 1 use their knowledge of materials when studying structures and building bridges.

Computing

Data loggers are used to assist in the collection of data. Software is used to animate and model scientific concepts, and to allow children to investigate processes which it would be impracticable to do directly. Children learn how to find, select and analyse information on the internet, distinguishing fact from opinion.

Philosophy for Schools and Rights Respecting School

Many of the debates in P4C sessions have links to scientific themes. Children learn that scientific knowledge needs to be used within an ethical framework. In a similar way, teachers make links between scientific knowledge and skills and the United Nations Rights of the Child articles.

Personal, social, health and economics education (PSHE) and citizenship

Science makes a significant contribution to the teaching of PSHE and citizenship. For example, children can apply what they have learnt about healthy lifestyles when considering their own health and wellbeing. They learn to care for their world, for example through recycling, and to become active global citizens. For some children this is a particular interest, and they may serve on our Eco Group.

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. Through many of the amazing processes that affect living things, children develop a sense of awe and wonder regarding the nature of our world. Children learn that scientific knowledge and skills need to be applied ethically.

Science and Inclusion

At our school we teach science to all children, whatever their ability or additional needs. Science forms part of the school curriculum to provide a broad and balanced education to all children. Through our science teaching we provide learning opportunities that enable all children to make good progress. We strive hard to meet the needs of those pupils with special educational needs, those with disabilities, those with special gifts

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and talents, and those learning English as an additional language, and we take reasonable steps to achieve this. We work within the frameworks of the school Special Educational Needs and Disabilities, Equal Opportunities and Gifted and Talented policies.

We enable all pupils to have access to the full range of activities involved in learning science. Where children are to participate in activities outside the school we carry out a risk assessment prior to the activity, to ensure that the activity is safe and appropriate for all pupils. See also the Day Trips policy and Residential Trips policy.

Impact and Assessment in science

We use assessment to inform and develop our teaching.

Topics commonly begin with an assessment of what children already know, and what they want to learn.

Teachers 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 and/or verbal feedback is given to the child to help guide his/her progress. Children are encouraged to reflect on their own, and others' work, and to make suggestions about how they can improve or develop, in ways appropriate for their age. The Balance App is used to facilitate these conversations and record judgements. See also the Marking policy.

At the end of a unit of work, the teacher makes a summary judgement about the work of each pupil, in relation to age-related expectations. Assessment tasks from the Science Bug scheme of work may be used.

Teachers make the statutory assessment of each child's attainment in science at the end of Key Stage 1 and the end of Key Stage 2. These assessments are reported to parents. If selected, Year 6 children, will also take part in Science Sampling assessments.

Science during the Corona Virus Epidemic

Science is a practical subject and involves the handling of equipment. This equipment will be well cleaned after use if possible or left for a three day quarantine period.

Since returning to school it has been noted that more children are showing an interest in working in science based careers, for example the National Health Service or vaccine development. We will continue to build 'Science Capital' showing the range of careers with STEM links, by showing video clips and engaging with STEM Ambassadors and The Big Bang STEM exhibition when possible.

Impact

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

This policy will be reviewed: In April 2021

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