

Greens Norton C of E Primary School



Policy for Science

'In our school everyone can join in with all we offer'

Approved by

Jane Docking, Chair of Governors
Ratified on:

Jan Pickering, Head Teacher
Due for review:

Science Policy

Background to the Policy

Science stimulates and excites pupils' curiosity about phenomena and events in the world around them. It also satisfies this curiosity with knowledge. As science links direct practical experience with ideas, it can engage learners at many levels. Scientific method is about developing and evaluating explanations through experimental evidence and modelling. This is a spur to critical and creative thought. Through science, pupils understand how major scientific ideas contribute to technological, business and medicine and improving the quality of life. Pupils recognise the cultural significance of science and trace its worldwide development. They learn to question and discuss their lives, the direction of society and the future of the world. (National Curriculum 1999)

The development of science skills is important in preparing all pupils for citizenship in a technological world where they can question and discuss science based issues that may affect their lives, the direction of society and the future of the world.

1 Aims and objectives

- 1.1 Science teaches an understanding of natural phenomena. It aims to stimulate a child's curiosity in finding out why things happen in the way they do. It teaches methods of enquiry and investigation to stimulate creative thought. Children learn to ask scientific questions and begin to appreciate the way science will affect their future on a personal, national, and global level.
- 1.2 The aims of science are to enable children to:
 - ask and answer scientific questions;
 - plan and carry out scientific investigations, using equipment, including computers, correctly;
 - know and understand the life processes of living things;
 - know and understand the physical processes of materials, electricity, light, sound and natural forces;
 - know about the nature of the solar system, including the earth;
 - evaluate evidence and present their conclusions clearly and accurately;
 - improve their learning and performance in education by promoting the six key skills embedded in the National Curriculum;
 - enable children to use and develop the five thinking skills embedded in the National Curriculum to enable the children to 'learn how to learn'.

2 Implementation

- 2.1** 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 where 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 pupils in 'real' scientific activities, for example, researching a local environmental problem or carrying out a practical experiment and analysing the results.
- 2.2** We recognise that there are children of widely different scientific abilities in all classes 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 by:
- setting common 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 in the room and setting different tasks for each ability group;
 - providing resources of different complexity, matched to the ability of the child;
 - using classroom assistants to support the work of individual children or groups of children;
 - using a variety of learning styles that include auditory, kinaesthetic and visual activities.

2.3 Foundation Stage

We teach science in the Foundation class as an integral part of the topic work covered during the year. As the reception class is part of the Foundation Stage of the National Curriculum, we relate the scientific aspects of the children's work to the objectives set out in the Early Learning Goals (ELGs) which underpin the curriculum planning for children aged three to five. Science makes a significant contribution to the objective in the ELGs of developing a child's knowledge and understanding of the world, e.g. through investigating what floats and what sinks when placed in water.

2.4 Key Stage 1

By the end of Key Stage 1 most children will be able to:

- explore and ask questions about living things, materials and phenomena;

- begin to work together to collect evidence to help answer questions and link this to simple scientific ideas;
- evaluate and consider whether tests or comparisons are fair;
- use reference materials to find out more about scientific ideas;
- share ideas and communicate them using scientific language, drawings, charts and tables.

2.5 Key Stage 2

By the end of Key Stage 2 most children will be able to:

- have knowledge of a wide range of living things, materials and phenomena;
- begin to make links between ideas and explain things using simple methods and theories;
- apply knowledge and understanding of scientific ideas to familiar phenomena, everyday things and their personal health;
- begin to think about positive and negative effects of scientific and technological developments on the environment and in other contexts;
- carry out scientific investigations, working on their own and with others;
- use a range of reference sources in their work;
- talk about their work and its significance;
- communicate ideas using a range of scientific language, drawings, charts, tables and graphs.

3 Science curriculum planning

- 3.1 The school uses the Qualifications and Curriculum Authority (QCA) scheme of work for Science as the basis of its curriculum planning. The QCA scheme has been adapted to the local circumstances of the school in that we make use of the local environment in our fieldwork. It is also adapted to support the facilitation of the school's Connected Curriculum.
- 3.2 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. In some cases we combine the scientific study with work in other subject areas; at other times the children study Science as a discrete subject.
- 3.3 Our medium-term plans, which we have based on the QCA scheme of work in Science, give details of each unit of work for each term. The science subject leader keeps and reviews these plans.
- 3.4 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.

- 3.5** 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.

4 The contribution of Science to teaching in other curriculum areas using key skills

4.1 English (key skill: communication)

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 Literacy Hour 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.

4.2 Mathematics (key skill: application of number)

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.

4.3 Information and Communication Technology (ICT)

(Key skill: ICT and problem solving)

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 on CD-ROMs. Children use ICT to record, present and interpret data and to review, modify and evaluate their work and improve its presentation.

4.4 Personal, Social and Health Education (PSHE) and citizenship (key skill: improving our own learning and performance and working with others)

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. For example, children study the way people recycle material and how environments are changed for better or worse. Secondly, children benefit from the nature of the subject in that it gives them opportunities to take part in debates and discussions. Science promotes the concept of positive citizenship.

4.5 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.

5 Inclusion

- 5.1** At our school we teach Science to all children, whatever their ability. Science forms part of the school curriculum policy to provide a broad and balanced 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. Opportunity will be found for more able children to extend their scientific understanding.
- 5.2** 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, and 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.
- 5.3** 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.

6 Assessment and recording

- 6.1** We assess children's work in science by making informal judgements as we observe them during lessons. On completion of a piece of work, the teacher marks the work and comments as necessary. At the end of a unit of work s/he makes a summary judgement about the work of each pupil in relation to the National Curriculum level of attainment. The teacher records the attainment grades in a mark book. We use these grades as the basis for assessing the progress of each child and we pass this information on to the next teacher at the end of the year.

- 6.2** Teachers make an assessment of the children's work in science at the end of Key Stage 1 and 2. We report the results of these tests to parents along with the teacher assessments which we make whilst observing the work of children throughout the year. We use teacher assessment to assess children's progress on an annual basis.
- 6.3** The science subject leader keeps samples of children's work in a portfolio and uses these to demonstrate what the expected level of achievement is in the Science units of study for each age group in the school.

7 Resources

- 7.1** We have sufficient resources for all science teaching units in the school. We keep these in a central store. 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.

8 Monitoring and review

- 8.1** 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.
- 8.2** The science subject leader gives the head teacher an annual summary report in which s/he evaluates strengths and weaknesses in the subject and indicates areas for further improvement. The science subject leader has specially-allocated time for fulfilling the vital task of reviewing samples of children's work and visiting classes to observe teaching in the subject.
- 8.3** The subject leader meets with a befriending governor. At least annually, to discuss the Science action plan.

9 The role of the Co-ordinator

It is the responsibility of the Science Co-ordinator to:

- write and update the curriculum policy for Science;
- produce and monitor the long-term curriculum map to ensure coverage of the scheme of work for Science;
- monitor and review medium-term plans for Science to ensure progression;
- aid colleagues with the planning and delivery of lessons when required;
- monitor and review standards of Science teaching through e.g. lesson observations, coaching techniques;
- produce an annual report reflecting on the standards of provision for Science and to set targets accordingly;

- review and order resources to enable the delivery of the Science curriculum.

10 Health and Safety

It is the responsibility of all staff to ensure that activities being conducted are done so safely and in accordance with the School's Health and Safety policy and the statutory health and safety guidelines as outlined by the LA.

All staff will always teach the safe handling of tools and equipment and insist on good practice.

Materials used (including low hazard chemicals such as lemon juice) will be assessed as to whether appropriate safety equipment (gloves, safety specs, aprons...) will be worn.

The use of night-lites will only be used if placed in a damp tray of sand, used by responsible children under direct supervision.

The use of hot water should only be at 'hand tolerant' temperature to avoid scolds. Children should not use boiling water.

Ratified on:

Due for review: