

Policy on Science



1 Aims and objectives

- 1.1 Science teaches an understanding of natural phenomena. It aims to stimulate a child's curiosity and sense of wonder about the world. It teaches methods of enquiry and investigation to stimulate creative thought as well as knowledge of the scientific facts and principles. Children learn to ask scientific questions, think in an analytical manner and begin to understand and appreciate that science will have a profound effect on the future. This will manifest itself on a personal, national and global level.
- 1.2 Our objectives in the teaching of science are for all our children:
- to ask and answer scientific questions;
 - to plan and carry out scientific enquiries, by means of prediction, investigation explaining data and results and Fair Tests.
 - to know how to evaluate evidence, and to present conclusions both clearly and accurately.
 - to know and understand about life and all related processes;
 - to know and understand about properties of materials, how they can change and their uses;
 - to know and understand about forces in nature and physical processes:

2 Teaching and learning style

- 2.1 We encourage the children to ask, as well as answer, scientific questions. They engage in a wide variety of problem-solving activities. Wherever possible, we involve the pupils in real scientific activities, e.g. investigating a local environmental problem, or carrying out a practical experiment and analysing the results.

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 practical activities where they learn through discovery.

They have the opportunity to use a variety of data, such as statistics, graphs, pictures and photographs. They use ICT to enhance their learning. They take part in role-play and discussions, and they present reports to the rest of the class.

- 2.2 We recognise that in all classes, children have a wide range of scientific 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 by using a variety of learning and teaching styles:
- setting tasks which are open-ended and can have a variety of responses;
 - setting tasks of increasing difficulty, staged to extend and challenge children's thinking (we do not expect all children to complete all tasks);
 - sometimes grouping children by ability in the room and sometimes in mixed ability, 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.

3 Science curriculum planning

- 3.1 Science is a core subject in the our Curriculum. The school uses the Congleton Partnership Planning document as the basis of their planning; it is in line with the new curriculum. This scheme has been adapted to the circumstances of the school in that we make use of the local environment in our fieldwork, within a five mile radius of the school. We regularly take children on welly walks. We also undertake scientific studies in the locality of the Cheshire Outdoor education centres that we use for residential visits for children in Years 2 to Year 6.
- 3.2 We carry out our curriculum planning in science in two phases (long-term and medium-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, so that it is integrated into topic work and the children begin to understand the relevance of science to everyday life. At other times, the children study science as a discrete subject so that children have a good grasp of scientific fact and principles.
- 3.3 Our medium-term plans give details of each unit of work for each term these are closely related to our assessment framework. The science subject leader keeps and reviews these plans. As we have some mixed-age classes, we do our long term planning on a rotating cycle. In this way, we ensure complete coverage of a broad Curriculum that delivers each science subject at an increasingly sophisticated level. This way the children are building on previously embedded knowledge which provides the foundation for higher understanding of the scientific principles. The science co-ordinator monitors the progression through the school.
- 3.4 The class teacher is responsible for writing the daily lesson plans for each lesson with is closely related to the topic (short-term plans). These plans list the specific learning objectives and expected outcomes of each lesson. The class teacher keeps these individual plans and the record of achievement. They and the science subject leader discuss them on a regular basis.
- 3.5 We have planned the topics in science so that they build on 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, revisiting a variety of topics as the children move up the school. This consolidates and builds on previous learning and challenging the children to investigate the theme to an ever increasing depth through investigations and research based activities.

4 The Foundation Stage

- 4.1 We teach science in reception classes as an integral part of the topic work covered during the year. In the reception class we relate the scientific aspects of the children's work to the objectives set out in the Early Years Foundation Stage Targets which underpin the curriculum planning for children aged three to five.

5 The contribution of science to teaching in other curriculum areas

5.1 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 Literacy lessons are of a scientific nature. The children develop oral skills in science lessons through discussions (e.g. 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.

5.2 Mathematics

Science contributes to the teaching of mathematics in several ways. When the children use weights and measures, they are learning to use and apply numbers. Through working on investigations, they learn to estimate and predict. They develop accuracy in their observation and recording of events. Data Handling is a large area in science and is taught through computing, maths and science.

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

Science makes a significant contribution to the teaching of PSHE and citizenship. 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 in which people recycle material and how environments are changed for better or worse. Secondly, the subject gives children numerous opportunities to debate and discuss. They can organise campaigns on matters of concern to them, such as helping poor or homeless people.

5.4 Spiritual, moral, social and cultural development

Science teaching offers children many opportunities to examine some of the fundamental questions in life, e.g. the evolution of living things and how the world was created. It gives us an opportunity to wonder at the inspiring world around us. When learning about 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 in which 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.

6 Science and Computing

- 6.1 Computing enhances the teaching of science in our school significantly, because there are some tasks for which computers are particularly useful. It also offers ways of impacting on learning which are not possible with conventional methods. Software is used to animate and model scientific concepts, and to allow children to investigate processes which it would be impracticable to do directly in the classroom. Children use computers to record, present and interpret data, to review, modify and evaluate their work, and to improve its presentation. Children learn how to find, select, and analyse information on the Internet and on other media. They also use e-mail to communicate on their scientific findings with children in other schools and countries.

7 Science and inclusion

- 7.1 At our school, we teach science to all children, whatever their ability and individual needs. 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 good progress.
- 7.2 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. Assessment against the curriculum objectives allows us to consider each child's attainment and progress against expected levels. This ensures that our teaching is matched to the child's needs.

- 7.3 Intervention through School initiatives may lead to the creation of an Individual Plan for children with special educational needs.
- 7.4 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 classroom (a trip to a science museum, for example), we carry out a risk assessment prior to the activity, to ensure that the activity is safe and appropriate for all pupils.

8 Assessment for learning

- 8.1 Teachers assess children's work in science by making formal judgements during lessons, if the child has achieved the objective set for that lesson. 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 questioned about their ideas and encouraged to make judgements about how they can improve their own work and extend their learning.
- 8.2 At the end of a unit of work, the teacher makes a summary judgement about the work of each pupil in relation to the curriculum objectives and learning outcomes. He/She records the attainment grades on the topic assessment sheets which relate to each learning unit. We use this 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.
- 8.3 Teachers make an assessment of the children's work in science annually based on data collected throughout the year. We report the progress of each child to parents at the end of every year.
- 8.4 The science subject leader keeps samples of children's work in a portfolio, and uses these to demonstrate the expected level of achievement in science for each age group in the school.

9 Resources

- 9.1 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.

10 Monitoring and review

- 10.1 The coordination and planning of the science curriculum are the responsibility of the subject leader, who also:
- supports colleagues in their teaching, by keeping informed about current developments in science and providing a strategic lead and direction for this subject;
 - gives the headteacher an annual summary report in which s/he evaluates the strengths and weaknesses in science and indicates areas for further improvement;
 - Delivers training and support.
 - Leads staff meetings and monitors progress in books.
 - Does formal lesson observations
 - Attends courses from a range of providers and disseminates this information to staff by running training.

- Checks current materials, audits and orders new materials

Signed:

Date: May 2015

Date of Review: Summer 2017