



Science Policy

Aims

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. Pupils learn to ask scientific questions and begin to appreciate the way science will affect their future on a personal, national, and global level.

The aims of science are to enable pupils to:

- develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics
- 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
- are equipped with the scientific knowledge required to understand the uses and implications of science, today and for the future

Teaching and learning style

We use a variety of teaching and learning styles in science lessons. Our principal aim is to develop pupils' knowledge, skills, and understanding. Sometimes we do this through whole-class teaching, while at other times we engage the pupils in an enquiry-based research activity. We encourage the children to ask, as well as answer, scientific questions. They use ICT in science lessons where it enhances their learning. They take part in role-play and discussions and make presentations 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.

We recognise that there are pupils of widely different scientific abilities in all classes and we ensure that we provide suitable learning opportunities for all pupils by matching the challenge of the task to the ability of the pupil. 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 and setting differentiated tasks for each ability group;
- providing resources of different complexity, matched to the ability of the pupil;
- using classroom assistants to work of individual children or groups of pupils.

Science curriculum planning

The school follows the current National Curriculum: Science Programmes of Study and our Curriculum Maps flesh out the knowledge, skills and vocabulary that we want pupils to use and demonstrate. We based our Curriculum Map on PLAN from the Primary Science Education Consultancy. Teachers make use of Developing Experts to support our curriculum. Teachers also can access Hamilton trust and Twinkl planning websites to support curriculum planning. Where appropriate, we make use of the local environment in our fieldwork.

We carry out our curriculum planning in science in four phases (curriculum maps, whole school programme of study, medium-term planning and lesson planning). The whole school

programme of study maps the scientific topics studied in each half term during the key stage. 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 discrete subject. All medium-term planning is saved on One Drive under science.

Our medium-term plans in science give details of each unit of work for each half term. As we have some mixed-age classes, we do some of our medium-term planning on a rotation cycle: In key stage one this is a two-year rotation cycle (Year A and Year B) and in lower key stage two it is a three-year rotation cycle (Year A, Year B and Year C). The year six class is taught separately and therefore covers the full curriculum content each year. In this way we ensure complete coverage of the National Curriculum. The medium-term plans identify the national curriculum objectives; links to our school values, British values and start qualities; cross-curriculum links; key vocabulary, knowledge, skills, outline of the lesson and resources.

The class teacher is responsible for writing or downloading and adapting lesson plans from one of our curriculum resource websites. These plans list the specific learning objectives of each lesson, details the teaching, independent activities and resources.

We have planned the topics in science so that they build upon prior learning. We capture the prior knowledge at the start of each unit and use the pupils starting points to guide and adapt our planning. We ensure that there are opportunities for all pupils of all abilities to develop their skills and knowledge in each unit and as shown on the curriculum maps, we build progression into the science programme, so that the children are increasingly challenged as they move up through the school.

In addition to weekly science lessons, we also build upon pupil's science learning through British Science week, the Great Science Share and Earth Day. We have a strong Eco Club who regularly organise environmental science events and activities throughout the year.

Foundation Stage

We teach science in the nursery and reception class as an integral part of the topic work covered during the year. As the nursery and reception class is part of the Foundation Stage of the National Curriculum, we relate the scientific aspects of the pupils' work to the objectives set out in Understanding the World. Science makes a significant contribution to developing a pupil's knowledge and understanding of the world, mathematics and expressive arts and design.

The contribution of science to teaching in other curriculum areas in KS1 and KS2

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 literacy 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. Pupils are encouraged to read science related topic books and child friendly newspapers as part of daily guided reading. Scientific vocabulary related to each science is displayed and pupils are encouraged to spell these words accurately; where appropriate some of these words are included in weekly spelling tests.

Mathematics

Science contributes to the teaching of mathematics in a number of ways. The pupils 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. They will collect data and use it to create graphs / charts, this will allow them to interpret results and form conclusions i.e. pictograms and scatter graphs.

Computing

Computing is used in all science lessons; initially to display the learning objectives. Teachers use various video clips as a teaching tool as well as simulations and virtual labs. When writing up the results of an investigation, computer programmes are used to collate and display results, in various formats. Pupils have regular access to the computers which they use to research a topic, access simulations, write up the results of an investigation, make posters and presentations.

Design and Technology

Science links well to design and technology under the disciplines of physics and chemistry. Pupils will create purposeful designs for example; when working with electricity pupils will make a game using a circuit or children will work with materials and create purposeful designs using their understanding of the properties of materials.

Personal, social and health education (PSHE) and citizenship

Science makes a significant contribution to the teaching of personal, social and health education. The subject matter lends itself to raising matters of citizenship and social welfare. For example, pupils study the way people recycle material and how environments are changed for better or worse. They consider the impact of humans on other living things and the environment. Science teaches the pupils about keeping themselves healthy through learning about the body and the effects of diet and exercise.

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, pupils develop a sense of awe and wonder regarding the nature of our world. Science raises many social and moral questions. For example: how much they recycle and why it is important. 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 pupils knowledge and understanding of physical and environmental factors, it promotes respect for other people.

Teaching science to children with special needs

We teach science to all pupils, whatever their ability. Science forms part of the school curriculum policy to provide a broad and balanced education for all pupils. We provide learning opportunities that are matched to the needs of children with learning difficulties. Our work in science considers the targets set in the pupils Individual Education Plans (IEPs).

Assessment and recording

We assess pupil's work in science by making formative assessments as we observe them during lessons. On completion of a piece of work, the teacher marks the work: commenting on learning and, where appropriate, suggests next steps using a brick symbol. At

the end of a unit of work the class teacher records each pupil's progress using the foundation stage assessment grids which are saved on the server. These grids clearly show whether pupils are working below, at or above the expected level and additional notes are provided showing next steps. At the end of the year, this information is then ready for the next teacher to print and use as a starting point for next year's planning. Teachers comments on pupil's attainment in science, both at parents evening and in the end of year reports.

Teachers assess the pupils' 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.

The science subject leader keeps samples of pupils' work in a subject leader file and uses these to demonstrate what the expected level of achievement is in science for each age group in the school.

Resources

We have sufficient resources for all science teaching units in the school. We keep these in a central labelled storage cabinet. The library contains a good supply of science topic books. We also request library topic boxes for each unit of science which we use to support teaching and learning.

Monitoring and review

It is the responsibility of the science subject leader to assist SLT 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. The science subject lead will lead a staff meeting twice annually to ensure teachers are aware of CDP available and to introduce any actions that has been carried out. When needed additional information is also communicated through emails.

Health and Safety

All children are made aware of the importance and relevance of health and safety when undertaking work in science. In planning, the class teacher is expected to assess the risks and adjust their lessons accordingly to ensure safe practice and appropriate levels of supervision. The CLEAPSS website is an excellent source of information and advice about minimizing risk in Science teaching.