Eastchurch Church of England Primary School

Science Policy

Date: Autumn 2012 **Review by: Autumn 2015**

Aims and objectives

Science teaches an understanding of natural phenomena and its applications in everyday life. 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.

At Eastchurch School 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
- know and understand about electricity, light, sound and natural forces;
- evaluate evidence and present their conclusions clearly and accurately.
- have a sense of wonder and curiosity about their world.

Teaching and learning style

We use a variety of teaching and learning styles in science lessons based on practical investigations and theoretical activities that the children reflect on. Our principal aim is to develop children's investigative skills in order to broaden their scientific knowledge, skills, vocabulary and understanding. This is carried out through whole-class teaching and engaging the children in enquiry-based research activities. We encourage the children to ask, as well as answer, scientific questions and provide opportunities to use a variety of data, such as statistics, graphs, pictures, and photographs. ICT is used to enhance the children's learning. They also take part in role-play, discussions, presenting reports to the rest of the class and engaging 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 investigation and analysing the results.

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 teaching assistants to support the work of individual children or groups of children;
- encouraging support from peers.

Science curriculum planning

The school uses the Kent scheme of work for science as the basis of its curriculum planning. The scheme is adapted to the local circumstances of the school in that we make use of the local environment in our fieldwork and the individual needs of our children.

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 year group across the year. The science co-ordinator works this out in conjunction with teaching colleagues in each year group. Within our cross-curricular approach to the children's learning we are developing our teaching to combine scientific study with work in other subject areas, at times this style of teaching will be inappropriate and children will continue to study science as a discrete subject.

Our medium-term plans, based on the Kent scheme of work, provide details of each unit of work for each term. The science subject leader regularly reviews these plans, ensuring the appropriate coverage of National Curriculum statements is met. These plans list the specific learning objectives of each lesson. The class teacher keeps these individual plans, and s/he and the science Co-ordinator often discuss them on an informal basis if appropriate. The class teacher is responsible for annotating and keeping informal records of each lesson in order to support the short term planning that is completed on a weekly basis. Differentiation should be planned for and evident on each plan, particularly where it is not clearly stated on the Kent scheme of work.

Topics in science have been planned 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.

Scientific Enquiry

At Eastchurch we believe in developing the children's understanding of scientific facts and concepts through using a range of planned investigations and practical tasks that build on prior skills and knowledge. We encourage the children to participate in worth-while experiences that will progressively develop their ability to plan, carry out and evaluate their own scientific investigations, appreciating the need to carry out a 'fair test'.

Investigative work will usually focus on the development of one or two skills. Throughout each term the children should have the opportunity to participate in the different key areas of the investigative process at a level appropriate to their age and ability. These are;

- Developing ideas and evidence
- Planning
- obtaining and presenting evidence
- Considering evidence and evaluating

Children in upper key stage 2 should be challenged to carry out the complete investigative process in small groups.

All children should record an area of investigative work at the end of the science unit, which should be recorded in their red scientific enquiry books. These books will be passed up to their next teacher at the end of the each year.

Foundation Stage

We teach science in reception classes as an integral part of the topic work covered during the year through the Knowledge and Understanding of the World strand of learning. 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 Years Foundation Stage Document, which underpins the curriculum planning for children from birth to five. Science makes a significant contribution to the objectives in the early years in developing a child's knowledge and understanding of the world, e.g. through investigating what floats and what sinks when placed in water.

The contribution of science to teaching in other curriculum areas

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 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.

Mathematics

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, recording of events and reading scales. They use numbers in many of their answers and conclusions. In Upper Key Stage 2, they will be expected to draw conclusions from graphs and tables and to create their own in support of investigations carried out.

Information and communication technology (ICT)

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 may use ICT to record, present and interpret data and to review, modify and evaluate their work and improve its presentation. The Intel Microscope is another excellent resource that we use within our science sessions to develop the use of ICT.

Personal, social and health education (PSHE), Citizenship, Environmental Education and Sustainable Development.

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. They organise campaigns on matters of concern to them, such as helping the poor or homeless. Science promotes the concept of positive citizenship. Finally, it encourages children to work co-operatively, a vital skill to develop within investigative work.

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.

Teaching science to children with special needs

We teach science to all children, whatever their ability. Science forms part of the school curriculum policy to provide a broad and balanced education for all children. We provide learning opportunities that are matched to the needs of children with learning difficulties. All children are encouraged to record their scientific knowledge in ways that are appropriate to their individual abilities, eg: pictorial representations or using ICT to verbally record their responses.

Assessment and recording

We assess children's work in science by making informal judgements as we observe them during lessons. This is recorded through lesson evaluations. On completion of a piece of work, the teacher marks the work and comments against the session objectives as necessary.

One investigation each term is to be recorded in an investigation book, focussing on a key area of AT1 (scientific enquiry). As for APP the teacher will choose 6 children's work of different abilities to level using a specific criteria sheet. These levels will then be used as a bench mark to level the rest of the class. This is to help monitor work being completed but also to support staff in levelling children's attainment in Science.

Year 5 and 6 children will also complete a 'scientific knowledge' test at the end of each term, with year 6 children then completing a test at the end of the year following KS2 SATS.

Year 4 will complete 1 'scientific knowledge' test at the end of the year to be used as a GAP analysis by the science coordinator to ensure Science in Upper KS2 is tailored to meet the needs of the cohort of children.

Teachers make a formal assessment of the children's work in science at the end of Key Stage 1 and Key Stage 2, which is reported to parents. They focus on the teacher assessments which we make whilst observing the work of children throughout the year. There is a heavy emphasis placed on the children's ability to carry out investigative science activities. The overall assessment therefore reflects their enquiry skills and not their actual knowledge.

The Science Co-ordinator 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.

Resources

We have sufficient resources for all science teaching units in the school. We keep these in a central store in the resources room, where all resources should be kept. The library contains a good supply of science topic books to support children's individual research. A list of useful children's websites is also available to encourage children to use ICT to research. The school buildings and grounds are a valuable resource at Eastchurch School. Different habitats can be compared such as the pond, trees, wildlife area and field. The building allows first-hand experience of materials and textures.

Whilst the ordering and monitoring of stock is the responsibility of the Science Co-ordinator, it is expected that the general upkeep of the resource area will be maintained by all staff who should tidily replace the stock they have used following an investigation. All stock should be returned to the resource room on the day that it has been used, to ensure that all staff have access to resources. Should any breakages occur to resources, staff should report this to the science co-ordinator as soon as possible.

To aid the application and understanding of scientific vocabulary, classes within key stages 1 and 2 display and use vocabulary cards linked to each scheme of work.

Health and Safety

Although great care is taken with the ordering of materials used in school it is always advisable that children wash their hands thoroughly after science investigations. Materials and equipment should be stored cleanly and safely. Issues relating to health and safety occur throughout the programme of study and attainment targets. All staff need to be aware of the dangers that science activities can bring, and be familiar with the Association for Science Education 'Be Safe' document which is available for reference in the staff room.

Due care and attention to formal health and safety procedures must be taken in the school grounds. (Please refer to the Health and Safety Policy)

Monitoring and review

It is the responsibility of the Science Co-ordinator to monitor the standards of children's work and the quality of teaching in science. The Science Co-ordinator 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 Co-ordinator gives the headteacher a subject improvement plan annually indicating areas for further improvement within the subject. The Science Co-ordinator 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. Information from monitoring is shared with staff and is used to inform future action planning to lead the subject forward and ensure good practice in Science.