



'What we learn with pleasure we never forget'

# SCIENCE POLICY

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**Headteacher**.....

**Date**.....

**Chair of Governors**.....

**Date**.....

# Carlton Colville Primary School

## Science Policy

### Aims

Science teaches an understanding of and develops a sense of excitement and curiosity about natural phenomena. It aims to stimulate children to find out why things happen in the way they do and encourages them to understand how science can be used to explain what is occurring, predict how things behave and analyse causes. It teaches children to work scientifically to stimulate creative thought and understand the nature, processes and methods of science. Children learn to ask scientific questions and begin to appreciate the way in which science will affect the future on a personal, national, and global level.

The objectives of teaching science are to enable children to:

- Work scientifically so as to develop an understanding of the nature, processes and methods of science, through different types of scientific enquiry that help them to ask and answer scientific questions about the world around them.
- Develop scientific knowledge and conceptual understanding in the following areas:
  - Biology: including plants, animals, habitats, evolution and inheritance.
  - Chemistry: including everyday materials and their uses, rocks, states of matter and the properties and changes of materials.
  - Physics: including seasonal changes, light, forces, magnets, sound, electricity and earth and space.
- 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 cross-curricular science led themes and also through some discrete science based teaching. Our principal aim is to develop children's knowledge, skills, and understanding. Sometimes this is achieved through whole-class teaching, while at other times we engage the children in enquiry-based research activities. We encourage the children to ask, as well as answer, scientific questions and they have the opportunity to collect, analyse and present a variety of data, such as statistics, graphs, pictures, and photographs. Teaching and learning is also based outside within the school grounds whenever possible. Children also use ICT in science because it enhances their learning. They take part in role-play and discussions and they present reports to the rest of the class, enabling them to make their thinking clear to themselves and others, to develop their use of scientific vocabulary and to articulate scientific concepts clearly. They engage in a wide variety of problem-solving activities, and wherever possible we involve the pupils in real scientific

activities, for example, investigating a local environmental problem, or carrying out a practical experiment and analysing the results.

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 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 flexibly within the classroom, and setting different tasks for each group;
- providing resources of different complexity, matched to the ability of the child;
- using teaching assistants to support and extend the work of individual children or groups of children.

### **Science curriculum planning**

The school uses the new National Curriculum programme of study for science as the basis of its curriculum planning. The national scheme has been adapted to the local circumstances of the school in that we make use of the local environment in our fieldwork, although we choose a locality where the physical environment differs from that which predominates in our immediate surroundings.

We carry out our curriculum planning in science as part of our flexible and creative themes so that cross-curricular links are made, giving real purpose to learning in the context of a theme. Some discrete teaching of science is also planned where links are not valuable. Long term and medium term planning is embedded in each year group's curriculum maps, as developed through the Chris Quigley programme. This theme based approach covers all the statutory science skills and content based on the national curriculum programme of study for science.

We have planned the science skills and content within our themes so that they build on prior learning. We ensure that there are opportunities for children of all abilities to develop their skills, knowledge and learning. We also build progression into the science skills as outlined within our curriculum maps, so that the children are increasingly challenged as they move up through the school.

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## **The Foundation Stage**

Science is taught in Early Years within one of the seven areas of Learning, Understanding the World, as an integral part of themed work covered during the year. As the Nursery and Reception classes are part of the Early Years Foundation Stage National Curriculum, we relate the scientific aspects of the children's work to the objectives set out in the 'Development Matters' and Early Learning Goals (ELGs) which underpin the curriculum planning for children from birth to age five. Science makes a significant contribution to developing a child's knowledge and understanding of the world, for example through exploration and investigation of what floats and what sinks when placed in water. The Early Years children also take part in the forest schools programme which includes environmental science.

## **The contribution of science to teaching in other curriculum areas**

### **English**

Science contributes significantly to the teaching of English in our school because both areas of the curriculum are fully embedded into our themes and are no longer solely taught as discrete subjects. This means that we are actively promoting the skills of reading, writing, speaking and listening within a science-based theme.

### **Mathematics**

Science contributes to the teaching of mathematics in a number of ways. When working scientifically the children learn to use and apply number, measurements and statistics. They also develop maths skills such as estimating, predicting, spotting and explaining patterns and develop accuracy in their observation and recording of events. Many of their answers and conclusions include numbers and measurements.

### **Personal, social and health education (PSHE) and citizenship**

Science makes a significant contribution to the teaching of PSHE and citizenship. This is mainly in three 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, the subject gives children numerous opportunities to debate and discuss. They can organise campaigns on matters of concern to them, such as helping the poor or homeless. Science thus promotes the concept of positive citizenship. Thirdly, within the scientific study of animals knowledge and understanding of human biology, lifecycles and healthy living are taught

which link directly to areas within the personal and health sections of the PSHE programme of study, including SRE.

### **Spiritual, moral, social and cultural development**

Theme-based 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 also 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.

### **Science and ICT**

Information and communication technology enhances the teaching of science in our school significantly because there are some tasks for which ICT is 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. Data loggers are used to assist in the collection of data and in producing tables and graphs. Children use ICT 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.

### **Science and inclusion**

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. We strive hard to meet the needs of those pupils with special educational needs, those with disabilities, those with special gifts and talents, and those learning English as an additional language, and we take all reasonable steps to achieve this. For further details, see individual whole-school policies: Equalities; Special Educational Needs; Disability Equality Scheme; Gifted and Talented.

When progress falls significantly outside the expected range a 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 actions to enable the child to learn more effectively. Assessment against the National Curriculum allows us to consider each child's attainment and progress against expected milestones. This ensures that our teaching is matched to the child's needs.

Intervention will lead to the creation of an Individual Education Plan (IEP) for children with special educational needs. The IEP may include, as appropriate, specific targets relating to science.

We enable all pupils to have access to the full range of activities involved in learning science. Where children are to participate in activities off the school site (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. On a daily basis, children also participate in lots of activities outside within the school grounds. A whole school 'Outdoor Learning' risk assessment has been carried out and is updated regularly for all outdoor areas to ensure they are safe to use.

### **Assessment for learning**

Teachers will 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 or verbal feedback is given to the child to help guide his/her progress. Older children are encouraged to make judgements about how they can improve their own work and also to work together to peer assess.

At the end of some science-based learning within a theme, teachers make a summary judgement about the work of each pupil in relation to the expected milestones for their key stage, with older children sometimes being assessed using a more formal test. This summary includes judgements on a child's knowledge and understanding of science and their practical use of scientific methods, processes and skills. We use these judgements as the basis for assessing the progress of each child, and pass this information on to the next teacher at the end of the year.

Teachers make a final assessment of the children's attainment in science at the end of every year and report this to parents.

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.

### **Resources**

We have sufficient resources for all science teaching units in the school. These resources are regularly updated and added to and kept in central science storage areas. The library contains a good supply of science topic books and we have computer software and Internet access to support children's individual research.

In addition to these school based resources teachers are encouraged to use the expertise of STEM ambassadors to enhance their Science topics. The knowledge and skills the ambassadors share will improve and enrich children's understanding. Through this enrichment we also hope to make pupils understand the many opportunities there are in the field of Science and approach it with enthusiasm.

### **Monitoring and review**

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 the school. The subject leader has specially-allocated time for fulfilling the vital task of reviewing samples of children's work, and visiting classes to observe science teaching.

This policy will be reviewed at least every three years.