



# **INCLUSIVE LEARNING FEDERATION**

## **Bradwell Village School Science Policy**

**Written by: N Murray**

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## Science Policy

### Introduction

A high-quality Science education provides the foundations for understanding the world through the specific disciplines of biology, chemistry, and physics. Science has changed our lives and is vital to the world's future prosperity, and all pupils should be taught essential aspects of the knowledge, methods, processes, and uses of science. Through building up a body of key foundational knowledge and concepts, pupils will be encouraged to recognise the power of rational explanation and develop a sense of excitement and curiosity about natural phenomena. They will be encouraged to understand how science can be used to explain what is occurring, predict how things will behave, and analyse causes.

Children are naturally fascinated by everything in the world around them and science makes a valuable contribution to their understanding. Children learn by playing with things in their world. They pick up clues about what they see, touch, smell, taste and hear in order to make sense of it all. Eventually they come to conclusions which they match up with all the experiences they have had. Teachers and parents/carers can help children to take a second, careful look at the world. By talking together children can be encouraged to explore and observe so that they can group objects and events and look for similarities and differences. They will need to measure and record the things they have found out in ways that make sense to them so that later they can talk to other people about what they have discovered. They should be encouraged to understand how science can be used to explain what is occurring, predict how things will behave, and analyse causes.

### Intent

As we live in an increasingly scientific and technological age, we believe that the children at Bradwell Village School need to acquire the knowledge, skills and understanding to prepare them for life in the 21st century. In line with the National Curriculum, it is our intention that children will experience high-quality science education, through the disciplines of biology, chemistry, and physics, to equip them with the scientific knowledge required to understand the uses and implications of science for yesterday, today and the future.

We aim for all children by the end of year 6 to:

- Develop an 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
- Stimulate children's interest and enjoyment of science
- Equip children to use themselves as starting points for learning about science, and to build on their enthusiasm and natural sense of wonder about the world
- Develop through practical work the skills of observation, prediction, investigation, interpretation, communication, measurement, questioning and hypothesising
- Encourage and enable pupils to offer their own suggestions, and to be creative in their approach to science, and to gain enjoyment from their scientific work
- Enable children to develop their skills of co-operation through working with others, and to encourage where possible, ways for children to explore science in forms which are relevant and meaningful to them
- Encourage children to collect relevant evidence and to question outcomes and to persevere

- Encourage children to treat the living and non-living environment with respect and sensitivity
- Encourage children to raise questions and learn how to investigate and explore these using both first-hand experience and secondary sources
- Help children understand the nature of scientific ideas and to obtain and test the evidence for themselves
- Help children recognise and assess risks and hazards to themselves and to others when working with living things and materials and to take action to control them
- Record their scientific work and findings in a variety of ways including using ICT

Pupils will be able to describe associated processes and key characteristics in common language, but they will also be familiar with, and use, technical terminology accurately and precisely. They will build up an extended specialist vocabulary and will also apply their mathematical knowledge to their understanding of science, including collecting, presenting, and analysing data.

In key stage 2 the children will study the following areas:

- Working scientifically
- Rocks
- Light
- Forces and magnets
- Living things and their habitats
- States of matter
- Sound
- Electricity
- Materials – properties and changes
- Plants
- Animals including humans.
- Diet and Hygiene/Healthy Bodies
- Evolution and inheritance
- Earth and space

In Key Stage 2, the pupils will broaden their scientific view of the world around them through exploring, talking about, testing, and developing ideas about everyday phenomena and the relationships between living things and familiar environments, and by beginning to develop their ideas about functions, relationships, and interactions. They will ask their own questions about what they observe and make some decisions about which types of scientific enquiry are likely to be the best ways of answering them, including observing changes over time, noticing patterns, grouping, and classifying things, carrying out comparative and fair tests and finding things out using secondary sources of information. They will draw simple conclusions and use scientific language, first, to talk about and, later, to write about what they have found out. Later in key stage 2 the pupils will develop a deeper understanding of a wide range of scientific ideas. They will do this through exploring and talking about their ideas; asking their own questions about scientific phenomena; and analysing functions, relationships, and interactions more systematically. They will encounter more abstract ideas and begin to

recognise how these ideas help them to understand and predict how the world operates. They will also begin to recognise that scientific ideas change and develop over time.

### **Implementation**

Science strands begin with children experiencing a phenomenon that excites them and offers a chance to develop and pose questions. Then children have the opportunity to: say what they know, what they want to find out and at the end of the strand say what they have learnt. Teachers use the children's knowledge and questions to inform their planning. The children's questions are used by teachers as the basis of investigations adding their own questions to ensure coverage of the different types of investigations and national curriculum knowledge areas. This ensures that science teaching is child led but also covers the curriculum requirements.

There is a whole school approach to planning and assessment, based on the National Curriculum 2014 and organised using a creative curriculum supported by the Developing Experts Science Scheme. We believe Science encompasses the acquisition of knowledge, concepts, skills, and positive attitudes. Our science planning promotes communication in the use of specific and precise language involving mathematical and logical thinking. It allows children to develop ways of finding out for themselves and gives them practice in problem solving. In science, pupils are encouraged to be open-minded and to try and make sense of what they observe and discover.

Science is taught as a discrete lesson and as part of cross-curricular themes when appropriate. Science links with other areas of the curriculum including Geography, English, Mathematics, Computing, Art And Design & Technology. The programmes of study describe a sequence of knowledge and concepts. While it is important that pupils make progress, it is also vitally important that they develop secure understanding of each key block of knowledge and concepts in order to progress to the next stage.

The children work individually, in pairs, as part of a small group or as a whole class. A variety of means for communicating and recording work are used. Discussion and debate are a central theme in Science lessons. Literacy problems are not a barrier to science learning as the children have a range of methods available to them for recording their work. In class support is available to support children with their reading. All children access science at their own level and are stretched and challenged appropriately. Some children will need more support than others. Lessons are adapted to meet children's needs and staff are free to respond to individual needs as required including going 'off plan'. Opportunities are built into lessons to allow the children room to discover – intervening when appropriate with questions to scaffold and support.

Science resources are centrally stored in the science cupboard where equipment is stored in labelled trays. The subject leader is responsible for setting up and maintaining this area, however, all staff are responsible for ensuring equipment is returned neatly and cleaned. Any breakages or when equipment needs to be replenished are to be reported to the subject leader. Any requests for materials or equipment should be made at least 3 weeks before they are required.

All classrooms have space for Science vocabulary, knowledge organisers and on-going class enquiries and when appropriate, these are part of a subject display.

### **Health and safety**

Every Science lesson is carried out in line with the school's Health & Safety Policy and following the recommendations in the 'Be Safe' booklet (ASE 2011). To ensure Science is delivered in line with the school's Health & Safety Policy, everyone has a duty of care and must follow the Health & Safety guidelines. For science these include ensuring that:

- Risk assessments are carried out and are on-going prior to and during science lessons
- The equipment, apparatus and environment/s are safe prior to and during the lessons
- All equipment is stored safely
- Children are given health and safety advice during lessons as necessary
- All long hair is tied back if there is a risk of it getting tangled in the equipment
- Pupils wear appropriate clothing and PPE as necessary
- Accidents are recorded in line with the school's policy. Pupils who receive first aid will have their parents/carers notified and the incident will be recorded in the first aid book

Prior to arranging an offsite science activity, a risk assessment will need to be completed and signed off before this takes place.

### **Special Educational Needs Disability (SEND) / Pupil Premium / EAL/ Higher Attainers**

All children will have Quality First Teaching and an adapted Curriculum. A variety of teaching methods and resources are used to cater for individual learning styles and needs, and to maximise participation/ engagement in lessons, e.g., games, oral presentations, cloze procedures, role-play, dictation, dictionary work, videos, etc. Our school offers a demanding and varied curriculum, providing children with a range of opportunities in order for them to reach their full potential and consistently achieve highly from their starting points.

Any children with identified SEND or in receipt of Pupil Premium funding may have work additional to and different from their peers in order to access the curriculum dependent upon their needs.

### **Adaptations to the Curriculum for Pupils with SEND**

The subjects in our curriculum are ambitious for all pupils, including children with SEND. Curriculum Leaders have high expectations of what SEND pupils can achieve. The curriculum is not diluted or unnecessarily reduced for SEND learners.

### **Individual needs**

We understand that every pupil is different and so, what works for each pupil will vary. There are general practices which are likely to improve learning and achievement for SEND pupils, but the success of any adaptations will depend on how pupils' individual needs have been considered and met.

### **Curriculum Planning**

SEND pupils, like all pupils, benefit from careful consideration of the components of a curriculum. These should be introduced in manageable 'chunks'. The size of these chunks might differ between different groups of pupils depending on their individual needs. The chunks should be sequenced in a coherent way to enable pupils to build on prior knowledge. Too much information at once can be a barrier to learning and can reduce the chances of pupils remembering what they are being taught.

### **Instruction and Working Memory**

SEND pupils will benefit from instruction which is matched to their needs. This means that teachers choose methods of instruction (e.g. precision teaching) which increase the chances of SEND pupils being able to pay sufficient attention to the curriculum objectives while understanding that overly elaborate tasks can make it more difficult for SEND pupils (particularly those with receptive language delay) to learn the curriculum content. We ensure that working memory is always considered. Where working memory is an issue for SEND pupils, it can be effective to reduce extraneous load as much as possible as well as isolating key information when teaching. We support pupils to pay attention to the content which they are expected to learn.

Working memory limitations correlate strongly with pupils' performance in Science. The curriculum should not be narrowed for pupils with SEND and it should not be assumed they learn content better through practical work, as this cause distraction and cognitive overload rather than increase clarity or accessibility. When knowledge is broken down into key components and organised sequentially, this can help all learners to succeed.

### **Remote learning**

Children have access to learning resources delivered through Padlet or Google classrooms and they are able to respond to the tasks set either through the above platforms or by emailing their work to their class teacher.

### **Assessment and Impact**

Formative and summative methods of assessment are used in Science. Children review their successes in achieving the lesson objectives at the end of every session and are actively encouraged to identify their own target areas. These targets are shared and verified by the teachers as necessary. They will also record what they have learned from their starting points at the end of every strand.

Summative assessments use the outcomes of work which are regularly monitored to ensure the individual child has a sound understanding of the key identified knowledge. Reported data is based on the working scientifically criteria, making this a crucial part of teachers' thinking and planning. Class teachers assess children's knowledge and understanding of Science prior to recording them on Insight. This data is then analysed and used to plan further actions to improve the provision of Science for all children.

### **Monitoring**

This policy is monitored through:

- Lesson observations
- Learning walks
- Work scrutiny

- The monitoring of planning
- Progress data