



# Science Policy

### **The importance of Science in the Curriculum**

Science stimulates and excites pupils' curiosity about phenomena and events in the world around them. It also satisfies their curiosity with knowledge. Because science links direct practical experience with ideas, it can engage learners at many levels. Scientific method is about developing and evaluating explanations through experimental evidence and modelling. This is a spur to critical and creative thought. Through science, pupils understand how major scientific ideas contribute to technological change impacting on industry, business and medicine and improving the quality of life. Pupils recognise the cultural significance of science and trace its world-wide development. They learn to question and discuss science-based issues that may affect their own lives, the direction of society and the future of the world.

### **The School aims to:**

- stimulate and excite pupils' curiosity about changes and events in the world;
- satisfy this curiosity with knowledge;
- engage pupils as learners at many levels through linking ideas with practical experience;
- help pupils to learn to question and discuss scientific issues that may affect their own lives;
- help pupils develop, model and evaluate explanations through scientific methods of collecting evidence using critical and creative thought;
- show pupils how major scientific ideas contribute to technological change and how this impacts on improving the quality of our everyday lives;
- help pupils recognise the cultural significance of science and trace its development.

### **Strategy for Implementation**

Science is a subject within the National Curriculum and pupils undertake some science activity every week at both key stages, or the equivalent amount of science may be taught in blocks of lessons. The work covered in Key Stage 1 builds on the nationally recognised curriculum for pupils aged under five, where pupils develop their knowledge, understanding and skills through first hand activities.

Science is allocated ten per cent of the taught time at both key stages, amounts to about 80 hours per year at Key Stage 1 and about 90 hours per year at Key Stage 2.

### **Early Years Foundation Stage**

Pupils work towards the ELGs (Early Learning Goals) to help them find out about living things, materials and physical phenomena. They use first hand experiences to help them make sense of scientific ideas. Science makes a significant contribution to the ELGs to develop a child's knowledge and understanding of the world, looking at the areas of technology, the world and people and communities. We use Tapestry to share learning with parents, encouraging them to contribute experiences from home. At the end of

EYFS a judgement is made whether the pupil is emerging, expected or exceeding the ELGs.

### **Key Stage 1**

At Key Stage 1 pupils observe, explore and ask questions about living things, materials and physical phenomena. They begin to work together to collect evidence to help them answer questions and to link this to simple scientific ideas. They observe changes over time, notice patterns, group and classify, carry out simple comparative tests and find things out through secondary resources such as books, photographs and videos.

### **Key Stage 2**

At Key Stage 2 pupils learn about a wider range of living things, materials and physical phenomena. In Lower Key Stage 2 they broaden their scientific view of the world around them and in Upper Key Stage 2 they develop a deeper understanding of a wide range of scientific ideas. They make links between ideas and explain things using models and theories. They apply their knowledge and understanding of scientific ideas to familiar phenomena, everyday things and their personal health. They think about the effects of scientific and technological developments on the environment and in other contexts. They carry out more systematic investigations, working on their own and with others. They use a range of reference sources in their work. They talk about their work and its significance, using a wide range of scientific language, conventional diagrams, charts, graphs and ICT to communicate their ideas.

### **Spoken Language**

The Science National Curriculum for 2014 recognises the importance of spoken language in pupils' development. The quality and variety of language pupils hear and speak are key factors in developing their scientific vocabulary. Pupils will be encouraged to make their thinking clear; both to themselves and others, and teachers should ensure that pupils build on secure foundations by using probing questions and remedying misconceptions.

### **Teaching and Learning**

All lessons in KS1 have a clear WALT (We Are Learning To) and in KS2 a TASK which are shared and reviewed with the pupils effectively. Most sessions will start with a question.

A variety of strategies, including questioning, discussion, concept mapping and marking, are used to assess progress. The information is used to identify what is taught next.

Activities inspire the pupils to experiment and investigate the world around them and to help them raise their own questions such as "Why...?", "How...?" and "What happens if...?".

Activities develop the skills of enquiry, observation, locating sources of information, selecting appropriate equipment and using it safely, measuring and checking results, making comparisons and communicating results and findings.

Lessons make effective links with other curriculum areas and subjects, especially English, Maths and ICT. Activities are challenging, motivating and extend pupils' learning. Pupils have frequent opportunities to develop their skills in, and take

responsibility for, planning investigative work, selecting relevant resources, making decisions about sources of information, carrying out activities safely and deciding on the best form of communicating their findings.

### **Continuity and Progression**

The school ensures curriculum continuity by following a carefully scheduled programme of science units. Liaison takes place between staff at the planning stages of each new unit. Some year groups carrying out the same topic will liaise and share practise.

### **Inclusion**

Planning at all levels ensures that the interests of boys and girls are taken into account. At Key Stage 1 and 2 the pupils may be grouped by ability or in mixed ability for activities. The pupils work individually, in pairs, as part of a small group and as a whole class each term. They use a variety of means for communicating and recording their work.

All pupils, including those with special educational needs, undertake the full range of activities.

### **Curriculum**

Long term planning: an overview of units of work covered in Science can be seen in the table below in accordance with the Science Curriculum for 2014. Due to mixed age classes, some year groups operate a two year cycle of science units.

| <b><u>Science Topics Key Stage 1</u></b> |                            |
|--|----------------------------|
| <b><u>Year 1</u></b>                     | <b><u>Year 2</u></b>       |
| Plants                                   | Plants                     |
| Animals including humans                 | Animals including humans   |
| Everyday materials                       | Living things and habitats |
| Seasonal changes                         | Uses of everyday materials |

| <b><u>Science Topics Key Stage 2</u></b> |                            |                            |                            |
|--|----------------------------|----------------------------|----------------------------|
| <b><u>Year 3</u></b>                     | <b><u>Year 4</u></b>       | <b><u>Year 5</u></b>       | <b><u>Year 6</u></b>       |
| Plants                                   | Animals including humans   | Animals including humans   | Animals including humans   |
| Animals including humans                 | Living things and habitats | Living things and habitats | Living things and habitats |
| Forces and magnets                       | States of matter           | Properties of materials    | Electricity                |
| Light                                    | Electricity                | Forces                     | Light                      |
| Rocks                                    | Sound                      | Earth and Space            | Evolution and inheritance  |

Medium term planning: This identifies within each unit or work; question focused learning, WALTs or TASKs, science activities, assessment opportunities, the vocabulary to be taught and used, safety issues, how information and communications technology and resources should be used. Working scientifically is a thread throughout the science curriculum and is taught through substantive science content.

### **Learning Resources**

Learning resources are kept in the science cupboard, located in the central hall. Relevant equipment is taken to the class by teachers or responsible pupils. Regularly in science based lessons, safety and safe use of equipment is covered but especially at the beginning of a new unit of work.

Pupils will be taught not to be careless and to use consumables efficiently. Older pupils may be taught how to locate and replace resources properly. Teachers should make sensible decisions, based on the age and stage of pupils, in relation to whether the teacher, the pupils under the guidance of an adult, or the pupils independently, should collect and replace resources.

Classrooms all have designated working displays of current science in hand. The profile of science should reflect its place as a core subject. All classrooms should display prominently the relevant scientific vocabulary being introduced in current units of work. Teachers at both key stages should maintain a science interest display, which encourages the pupils to be curious about the world in which they live. At Key Stage 1 this might involve something to look at carefully using a hand lens. At Key Stage 2 this might involve a recent newspaper article about a scientific discovery, which builds on, or contradicts the work of a famous scientist in history or could be an interest table i.e. force; selection of toys which require various forces to be applied in order to work. Resources for the unit of work being covered should be appropriately accessible. Other sources of information should be available.

### **Safe Practice**

Safe practice as indicated in The Association of Science Education publication, "Be Safe!" must be promoted at all times. Teachers must also take into account the school's Health and Safety policy. Particular attention must be given to avoiding the use of anything that aggravates individual pupils' allergies. Safety issues have been identified in medium-term planning and risk assessments must be completed in weekly planning, when activities are identified that are unusual and beyond the scope of normal safety practice.

### **Homework**

In Key Stage 2 project based homework may be set which has a link to an aspect of the science curriculum e.g. in year 6 pupils are asked to design and create a model fairground, which includes electrical circuits. At Key Stages 1 and 2 homework is mainly related to literacy or numeracy but aspects of science learning are encouraged e.g. vocabulary meanings or research.

### **English**

In particular, at Key Stage 1, the pupils are encouraged to use their speaking and listening skills to describe what they see and explain what they are going to do next. In addition to speaking and listening; at Key Stage 2 pupils are encouraged to develop their skills of writing to record their planning, what they observe and what they found out. Pupils are expected to read and spell scientific vocabulary at a level consistent with their increasing word recognition in Key Stage 1; correctly and with confidence, using their growing word reading and spelling knowledge in Lower Key Stage 2; and read, spell and pronounce scientific vocabulary correctly in Upper Key Stage 2. In relation to science, they should be applying their literacy skills at levels similar to those which they are using in their English work.

### **Maths**

At both key stages the pupils are expected to use their knowledge and understanding of measurement and data handling at appropriate levels. In science, they should be applying their numeracy skills at levels similar to those which they are using in their mathematics lessons.

### **ICT**

Pupils are encouraged to use ICT to: locate and research information (internet); record findings (using text, data and tables); log changes to the environment over time (sensing equipment and data loggers); gain confidence in using calculators, video cameras, digital cameras and microphones as well as the computer.

### **Assessment**

At the start of a unit of work, the pupils complete self-assessment activities both through a mind-map and a unit cover sheet which links to the objectives covered within the unit of work. The pupil then reviews these at the end of the unit. Teachers continually assess pupil learning through observations, questioning and marking of classwork; which together with the pupils' self-assessment provide rounded formative assessments of the pupils' understanding in both scientific concepts and working scientifically. Summative teacher assessment takes place at the end of each unit of work, noting any attainment and progress which is significantly lower or higher than expected. TA (teacher assessment) judgements reflect where pupils are working at the expected standard, has not met the expected standard or working at greater depth within the expected standard. Data is inserted into the school pupil tracker system to ensure progression of learning across the year groups and key stages.

### **Expectations**

Pupils are expected to meet age related expectations by the end of each year. Teachers consider a collection of evidence for the 'science content' and 'working scientifically statements' when reaching their TA judgements as to whether a pupil is working at the expected standard. By the end of each key stage, pupils are expected to know, apply and understand the skills and processes specified in the relevant programme of study.

At the end of Key Stages 1 and 2, judgements are made for each pupil's attainment: EXS working at the expected standard or HNM has not met the expected standard.

This policy will be reviewed in line with the school's policy review programme.

Signed .....  
(Chair of Governors)

Date .....

Signed .....

Date ..... (Headteacher)