

## Science Policy

### Introduction

Science is a core subject within the National Curriculum. This policy sets out the purpose, nature and management of Science taught at Studlands Rise First School.

### Development of Policy

The initial outline of the Policy was devised by the Science subject leader. The detail of this policy was developed through a process of discussions at staff meetings with the head teacher and all members of staff, to ensure the Policy fully reflects a consensus view of what the school is aiming to achieve in its teaching of Science.

### Rationale

We consider science to be a body of knowledge essential to the world around us. In addition, the skills and knowledge of science have a wide application in everyday life. We will find out what children already bring to a lesson in terms of knowledge, skills and understanding, and then allow them to develop as individuals.

“Science stimulates and excites pupils’ curiosity about phenomena and events in the world around them. It also satisfies this curiosity with knowledge...Pupils recognise the cultural significance of science...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.”  
(National Curriculum)

### Entitlement

- We believe that all children are entitled:
- To a broad and balanced science curriculum approach to their individual needs
- To be given opportunities to express their ideas fluently, develop inquiring minds, knowledge, skills and attitudes

### Aims

1. The overall aim of the staff is to deliver Science in line with the National Curriculum
2. To provide children with opportunities to experience, enjoy and learn from a wide range of Science topics.
3. To teach skills associated with science that will develop knowledge and understanding within the subject. These skills will be of value in other curricular areas and applicable to everyday life.
4. To ensure Science is relevant to the world of the child and capitalise on the child’s natural curiosity.
5. To ensure balance, breadth and progression throughout the school.
6. To use science to provide opportunities to develop children’s’ spiritual, moral, social and cultural development.
7. To promote key skills through science and encourage the development of thinking skills through scientific enquiry.

### Outcomes

To fulfil these aims, our specific objectives are:

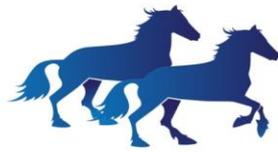
1. To develop interests and positive attitudes.
2. To develop basic concepts and logical thinking.

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To enable the children:

1. To respond to a challenge, ask questions and devise and carry out tests to investigate them.
2. To communicate meaningfully in an appropriate way.
3. To co-operate with others – to help the children to be aware of the needs of others and to be prepared to negotiate differences through discussion.
4. To develop respect and a sense of responsibility towards the environment.

### **Science within the National Curriculum**

Science is a core subject of the National Curriculum. The knowledge, skills and understanding covered in science in school are those laid down in the programmes of Study.

### **Science Programme of Study: Key Stage 1**

The teaching of science in Key Stage 1 should introduce pupils to a variety of plants and animals (including humans), materials and physical phenomena.

Pupils should study (by working scientifically, working practically, and using a variety of research methods including using books and ICT):

- Basic structures and simple classification of common plants and animals
- Life processes, including growth, reproduction and feeding, and growing plants
- Habitats, including food chains
- Simple physical properties of everyday materials in relation to their uses
- Sources of light
- Night and day, and the movement of the Sun across the sky
- Forces that make things move, speed up and slow down, and change shape.

Science biographies, for example, Charles Darwin.

'Working scientifically' is to be delivered through the teaching of substantive subject content, and is not to be taught separately as content in its own right. In Year 1 and Year 2, 'working scientifically' includes aspects of:

- Observing closely using simple equipment
- Performing simple tests
- Identifying and classifying
- Recording findings in various formats.

### **Science Programme of Study: Lower Key Stage 2**

The teaching of science in Lower Key Stage 2 should ensure that pupils know about a variety of plants and animals (including humans), materials and everyday phenomena.

Pupils should study (by working scientifically, working practically, and using a variety of research methods including using books and ICT):

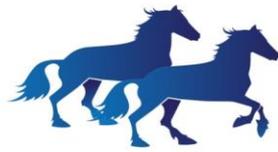
- The function of different parts of plants, and what plants need to survive
- What animals need to survive
- Movement in vertebrates, including humans
- Classification of living things: plants and animals
- Human digestion

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- Food chains and food webs
- Introduction to evolution and inheritance
- Everyday materials that are attracted to magnets, or that sink/float
- How to make a magnet and the properties of magnets
- Simple physical properties of some kinds of rocks, and how rocks and fossils are formed
- States of matter and changes of state, with particular reference to water
- Sources of sound
- Light and shadows
- Solar systems and galaxies, including the motion of the Earth in relation to the Sun
- The uses of electricity, and how to wire a simple circuit.

Science biographies, for example, Carl Linnaeus, Charles Darwin, Nicholas Copernicus, Galileo Galilei and Neil Armstrong.

'Working scientifically' is to be delivered through the teaching of substantive subject content, and is not to be taught separately as content in its own right. In Year 3 and Year 4, 'working scientifically' builds on earlier content and also includes aspects of:

- setting up simple comparative and fair tests
- beginning to make accurate measurements using standard units
- recording findings in various formats
- reporting on findings □ using results to draw conclusions and make predictions for setting up further tests.

### **Skills, Concepts and Attitudes to be Developed**

The concepts which the staff aim to teach correspond to those laid down in the Science National Curriculum.

Skills to be developed are the basic skills outlined in the National Curriculum:

- a. Observing
- b. Sorting and classifying
- c. Predicting and hypothesising
- d. Estimating and measuring
- e. Investigating and testing
- f. Communicating and recording
- g. Interpreting and evaluating.

In addition to this, staff will also promote key skills through the teaching of Science:

- a. Communication
- b. Application of number
- c. The use of IT
- d. Working with others
- e. Improving their own learning and performance
- f. Problem solving

Other aspects of the curriculum to be promoted through our teaching of science include:

- a. Thinking skills
- b. Enterprise and entrepreneurial skills
- c. Work-related learning skills

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d. Education for sustainable development.

The attitudes that the staff aim to encourage in the children are:

- a. Curiosity – to show interest and ask questions about new or unusual things.
- b. Co-operation – to be aware of the needs of others and fit in or negotiate through discussion.
- c. Open mindedness – to be prepared to listen and consider the views of others.
- d. Perseverance.
- e. Critical Reflection – to evaluate ideas in order to improve them if necessary.
- f. Originality, creativity and inventiveness.
- g. Responsibility and self discipline.

The staff aim to develop these attitudes in teaching science to the children but recognise that many of them are not unique to Science and also develop in other areas of the curriculum.

### **Cross curricular Links**

#### **English**

Science contributes significantly to the teaching of English in our school by actively promoting the skills of reading, writing, speaking and listening. 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 and recording of events. They use numbers in many of their answers and conclusions.

#### **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 use ICT to record, present and interpret data and to review, modify and evaluate their work and improve its presentation. They may also use e-mail to communicate their mathematical findings with other children in other schools and countries.

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

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 may organize campaigns on matters of concern to them, such as helping the poor or homeless. Science promotes the concept of positive citizenship.

#### **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

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many social and moral questions. 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 and learning style**

We use a variety of teaching and learning styles in science lessons. Our principal aim is to develop children's knowledge, skills, and understanding. Sometimes we do this through whole-class teaching, while at other times we engage the children in an enquiry-based research activity. We encourage the children to ask, as well as answer, scientific questions. They have the opportunity to use a variety of data, such as statistics, graphs, pictures, and photographs. They use ICT in science lessons where it enhances their learning. They take part in role-play and discussions and they present reports 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 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 classroom assistants to support the work of individual children or groups of children.

### **Progression**

Our long term plan for Science (see Appendix A) is organised so that it builds upon the prior learning of the children. While there are opportunities for children of all abilities to develop their skills, knowledge and understanding in each activity area, there is planned progression built into the scheme of work so that the children are increasingly challenged as they move up through the school.

### **Organisation of the Curriculum**

The school has a responsibility to cover the Programmes of Study for Key Stages 1 and 2 as stated in the National Curriculum 2014. Science is a core subject in the National Curriculum. In the Early Years Foundation Stage (EYFS) it is studied through the area of learning "Understanding of the World". It aims to stimulate the children's curiosity in finding out why things happen the way they do. Children learn to ask scientific questions and begin to appreciate the way science will affect their future on a personal, national and global level. Science links practical experience with ideas in the exploration of life processes and living things, materials and their properties and physical processes. Within the EYFS, KS1 and KS2 it encourages children to become interested in and begin to make sense of the world around them.

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### Overview of units - Appendix A

Year 1	Working Scientifically	Plants	Animals including humans	Everyday materials	Seasonal Changes	
Year 2		All living things and their habitats	Plants	Animals including humans	Use of everyday materials	
Year 3	Working Scientifically	Plants	Animals including humans	Rocks	Light	Forces and magnets
Year 4		All living things	Animals including humans	States of matter	Sound	Electricity

### Foundation Stage

We teach science in reception classes as an integral part of the topic work covered during the year. 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 Learning Goals (ELGs) which underpin the curriculum planning for children aged three to five. Science makes a significant contribution to the objective in the ELGs of developing a child's knowledge and understanding of the world, e.g. through investigating what floats and what sinks when placed in water.

### Differentiation

The staff recognises the importance of matching activities to individual pupils' needs when planning work. We aim to achieve this by differentiating the level of work or the task set, and the pace of teaching and the use of classroom support where possible. We meet the needs of individual pupils in the following ways:

**Differentiation by task** – where tasks are on the same theme but matched to pupils' abilities, or taught using different strategies;

**Differentiation by outcome** – where pupils are involved in the same task, but the work produced indicates different levels of achievement.

**Differentiation by structured tasks** – which increase in difficulty.

### Special Educational Needs (SEN)

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 all children. Our work in science takes into account the targets set in the children's Individual Education Plans (IEPs) and those highlighted on the provision maps.

### Equal Opportunities

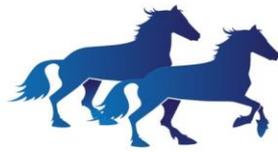
Science is taught in line with the school's Equal Opportunities Policy which promotes equality of access to all pupils.

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### **Assessment and Recording**

Assessment will take place in line with the school's assessment policy. It is ongoing and based on pupils' spoken, written and practical work. Teachers assess by observing pupils working individually within a group activity. Working scientifically will be continually assessed across the different units of work. The other units will each be assessed once per year (one a term) depending upon the topic being studied each term. Teachers make an assessment of the children's work in science at the end of Key Stage 1. 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.

### **Resources**

There is a wide range of resources to support the teaching of Science across the school. Resources for each area within the study units are kept in clearly labelled boxes in the resources room. Staff are encouraged to inform the science subject leader of any needs they may have to effectively teach the Science curriculum.

### **Health and Safety**

Please see Appendix B – 'Safety Policy'

### **Monitoring and the Role of the Subject Leader**

Monitoring of the standards of children's work and the quality of teaching in Science is the responsibility of the Science subject leader. The work of the co-ordinator also involves supporting teachers in the teaching of Science, being informed about current developments in the subject and providing a strategic lead and direction for the subject in the school. The co-ordinator gives the head teacher an annual review which evaluates strengths and weaknesses in the subject and indicates areas for improvement. The head teacher allocates time to the co-ordinator to review planning and undertake lesson observations of Science teaching throughout the school

### **Appendix B Safety Policy**

Science potentially has a number of hazards and the staff of Studlands Rise are aware that care must be taken in training children to use equipment correctly.

The staff and Governors agree that:

1. Glass equipment should not be used.
2. Children should know that some plants are poisonous and should be made aware of this.
3. Mercury thermometers should not be used.
4. Children should not use matches.
5. Low voltage batteries should be used and children must not use mains electricity.
6. The use of cutting devices can be dangerous and children need to be shown the correct techniques for using these.
7. Tasting should not be allowed except under strict supervision.
8. Teachers should be aware of pupils' allergies to animals, plants etc.
9. Hazardous glues and chemicals must never be used.
10. Children must be aware of safety in general when carrying and working with equipment.

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