

Ridgeway Primary School
Science Policy
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Introduction

Science in our school aims to stimulate and excite pupils' curiosity about phenomena and events in the world around them. It aims to develop children's ideas and ways of working, giving a practical way of finding reliable answers to questions that they may ask, supported with the use of other sources of information.

It proves to satisfy curiosity with knowledge. Science links direct practical experience with ideas and it engages learners at many levels. Scientific method is about developing and evaluating explanations through experimental evidence and modeling. Through science, pupils understand how major scientific ideas contribute to technological change. Pupils recognise the cultural significance of science and learn to 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.

Scientific Understanding

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 should be encouraged to recognise the power of rational explanation and develop a sense of excitement and curiosity about natural phenomena. They should be encouraged to understand how science can be used to explain what is occurring, predict how things will behave and analyse causes.

Aims

At Ridgeway, it is our aim for all pupils to:

- develop their knowledge and understanding of important scientific ideas, processes and skills and relate these to everyday experiences
- acquire a curious and questioning mind
- develop skills of observation and investigation
- collect, retrieve, present and communicate their findings to others in a variety of way

Strategies

These aims are taught through:

Knowledge and Understanding

Children should:

- Be curious about things they observe, experience and explore in the world around them.

- Use this experience to develop their understanding of key scientific ideas and make links between different phenomena and experiences.
- Begin to think about models to represent things they cannot directly experience.
- Try to make sense of phenomena, seeking explanations and thinking critically about ideas.

Processes and Skills

Children should:

- Acquire and refine the practical skills needed to investigate questions safely.
- Develop skills of predicting, asking questions, making inferences, concluding and evaluating based on evidence and understanding and use these skills in investigative work.
- Acquire practical mathematical skills in real contexts.
- Learn why numerical and mathematical skills are useful and helpful to understanding Science.

Language and Communication

Children should:

- Think creatively about Science and enjoy trying to make sense of phenomena
- Develop language skills through talking about their work and presenting their own ideas using sustained and systematic writing of different kinds.
- Use scientific and mathematical language including technical vocabulary and conventions and draw diagrams and charts to communicate scientific ideas.
- Read non-fiction texts and extract information from sources such as reference books and the internet.

Values and Attitudes

Children should:

- Work with others, listening to their ideas and treating these with respect.
- Develop respect for evidence and evaluate critically ideas, which may not fit the evidence available.
- Develop a respect for the environment and living things and for their own health and safety.

Planning and Organisation of the Curriculum

Planning for science is a process in which all teachers are involved in to ensure that the school gives full coverage of the 2014 Science National Curriculum and Foundation Stage. The whole school yearly science plan is based on the National Curriculum programme of study for each key stage, outlining the units to be covered. This provides a basis for termly and weekly planning. The units are provided as a starting point to the delivery of the curriculum. It ensures progression between year groups and guarantees topics are revisited. Science units are taught through a combination of whole class teaching, group and individual work. There is scope for teachers to use their own ideas and initiatives. It is down to teacher's discretion as to when the units are taught as some may link well with other curriculum areas or be more suitable to deliver at particular times of the year. Through our Science teaching, we hope that our children will develop a sense of awe and wonder about the world around them.

Breadth of Learning

	Key Stage 1		Lower Key Stage 2		Upper Key Stage 2	
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Biology						
Plants	•	•	•			
Animals including humans		•	•	•	•	•
Living things and their habitats		•		•	•	•
Evolution and inheritance						•
Chemistry						
Everyday materials	•					
Uses of Everyday materials		•				
States of matter				•		
Properties and change of materials					•	
Rocks			•			
Physics						
Seasonal changes	•					
Forces and magnets			•			
Forces					•	
Light			•		•	
Sound				•		
Electricity				•	•	
Earth and Space					•	

Curriculum Progression

Key Stage 1

The principal focus of science teaching in key stage 1 is to enable pupils to experience and observe phenomena, looking more closely at the natural and humanly-constructed world around them. They should be encouraged to be curious and ask questions about what they notice. They should be helped to develop their understanding of scientific ideas by using different types of scientific enquiry to answer their own questions, including observing changes over a period of time, noticing patterns, grouping and classifying things, carrying out simple comparative tests, and finding things out using secondary sources of information. They should begin to use simple scientific language to talk about what they have found out and communicate their ideas to a range of audiences in a variety of ways. Most of the learning about science should be done through the use of first-hand practical experiences, but there should also be some use of appropriate secondary sources, such as books, photographs and videos.

Lower Key Stage 2

The principal focus of science teaching in lower key stage 2 is to enable pupils to broaden their scientific view of the world around them. They should do this 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 should 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 simple comparative and fair tests and finding things out using secondary sources of information. They should draw simple conclusions and use some scientific language, first, to talk about and, later, to write about what they have found out.

Upper Key Stage 2

The principal focus of science teaching in upper key stage 2 is to enable pupils to develop a deeper understanding of a wide range of scientific ideas. They should do this through exploring and talking about their ideas; asking their own questions about scientific phenomena; and analysing functions, relationships and interactions more systematically. At upper key stage 2, pupils should encounter more abstract ideas and begin to recognise how these ideas help them to understand and predict how the world operates. They should also begin to recognise that scientific ideas change and develop over time. They should select the most appropriate ways to answer science questions using different types of scientific enquiry, including observing changes over different periods of time, noticing patterns, grouping and classifying things, carrying out comparative and fair tests and finding things out using a wide range of secondary sources of information. Pupils should draw conclusions based on their data and observations, use evidence to justify their ideas, and use their scientific knowledge and understanding to explain their findings.

At each learning stage, pupils should also be able read and spell scientific vocabulary at a level which is appropriate to their increasing reading and spelling knowledge.

Working Scientifically

'Working scientifically' specifies the understanding of the nature, processes and methods of science for each year group. During all key stages, the 'Working Scientifically' key skills must be taught within each area of Science, in accordance with the 2014 National Curriculum programme of study. It should not be taught as a separate strand.

The notes and guidance give examples of how 'working scientifically' might be embedded within the content of biology, chemistry and physics, focusing on the key features of scientific enquiry, so that pupils learn to use a variety of approaches to answer relevant scientific questions. These types of scientific enquiry should include: observing over time; pattern seeking; identifying, classifying and grouping; comparative and fair testing (controlled investigations); and researching using secondary sources. Pupils should seek answers to questions through collecting, analysing and presenting data.

Spoken Language

The 2014 National Curriculum reflects the importance of spoken language in pupils' development across the whole curriculum - cognitively, socially and linguistically. The quality and variety of language that pupils hear and speak are key factors in developing their scientific vocabulary and articulating scientific concepts clearly and precisely. They must be assisted in making their

thinking clear, both to themselves and others, and teachers should ensure that pupils build secure foundations by using discussion to probe and remedy their misconceptions.

Teaching and Learning

At Ridgeway, teachers plan and deliver high-quality and engaging science lessons incorporating a range of teaching and learning styles.

Teachers will provide opportunities for pupils to:

- Learn about science, where possible, through first-hand practical experiences;
- Develop their research skills through the appropriate use of secondary sources;
- Work collaboratively in pairs, groups and/or individually;
- Plan and carry out investigations with an increasing systematic approach as they progress through the school;
- Develop their questioning, predicting, observing, measuring and interpreting skills;
- Record their work in a variety of ways e.g. writing, diagrams, graphs, tables;
- Read and spell scientific vocabulary appropriate for their age;
- Be motivated and inspired by engaging and interactive science displays which include key vocabulary and relevant questions;
- Learn about science using the outdoor learning environment.

Monitoring

The leader monitors teaching and learning in the following ways:

- speaking to staff about work in progress
- feedback from staff during staff meetings
- work audits, providing feedback to staff
- planning trawls
- pupil interviews
- collecting photographic evidence of investigative work and science displays

Assessment and Reporting

Teachers at Ridgeway use assessment effectively to plan lessons that build on individual pupils' prior knowledge and provide feedback that genuinely helps pupils to improve their work in science. At the end of each topic, the teacher will make a summative judgment about the attainment of each child, recording whether they are working below, at, or above the expected standard in relation to the learning objectives.

Reporting on progress in Science is systematically monitored by the subject leader on a regular basis and is shared with parents during progress meetings and through the annual report.

Equal Opportunities

We aim to ensure equal access to all aspects of the 2014 Curriculum for Science, regardless of gender, race, background or ability. All children have an entitlement to a Science education at an appropriate and challenging level. This is important in order for pupils' to gain scientific

knowledge and understanding. The ability of all children within each class is taken into consideration when planning lessons and tasks and activities are differentiated accordingly.

Resources

- Practical equipment is stored in the large resource cupboard along the bottom key stage 2 corridor, together with a variety of books for teacher reference
- Our school grounds are an important resource and are widely used.
- A large number of Science 'Big Books' are stored in the school library.
- Computer software is to be found on computers in the computer suite and also on classroom computers. These resources are also for use with interactive white boards.
- A list of useful websites is available from the coordinator.
- Staff will notify the coordinator of any extra resources required, resources that need replacing and of any new materials that may be useful and new resources have been purchased in order to meet the requirements of the 2014 National Curriculum.
- A small amount of money is made available for staff to purchase necessary consumables for their lessons.

Health and Safety

- Guidelines in the A.S.E. booklet "Be Safe" are followed.
- Teachers must plan safe activities for science and complete a risk assessment if necessary. The teacher should be clear as to the purpose of the work and ensure that any testing that needs to be carried out complies with the Health and Safety procedures.
- All adults need to be aware of health and safety procedures when using equipment/food in Science lessons.
- Pupils must be aware of the need for personal safety and the safety of others during Science lessons.
- Staff organising trips linked to work in Science plan visits in accordance with Staffordshire guidelines and risk assessments are carried out prior to each visit. These are filed for use when trips are repeated.