



SCIENCE POLICY

Introduction

It is our aim in Science that children are given opportunities to observe, record and draw conclusions about the world around them. We hope to introduce children to the basic elements of experiments and investigations and help them to become more inquisitive. This policy outlines the teaching and learning of Science at St Marys Farnham Royal using the new Cornerstone curriculum. The implementation of the policy is the responsibility of all teaching staff and will be monitored by the Science Co-ordinator and Head Teacher.

Aims and Purposes

Through teaching Science using the Cornerstone curriculum children are given opportunities 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 through practical work.

Collect, retrieve, present and communicate their findings to others in a variety of ways.

Develop cross curricular skills – understanding how Science and Maths are linked.

Demonstrate progressive learning through engaging with the curriculum, developing and demonstrating their knowledge, showing innovation of the science knowledge acquired and then being able to express all their learning through investigative techniques which will be child led where possible.

Develop a healthy school through learning about exercise and nutrition through linking with PE. Q and A each lesson from EYFS to Year 6 on how to be healthy.

Planning

Scientific knowledge and conceptual understanding

The Cornerstones programme of study describes 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.

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

The nature, processes and methods of science

'Working scientifically' specifies the understanding of the nature, processes and methods of Science for each year group. It should not be taught as a separate strand.

Attainment targets

By the end of each key stage, pupils are expected to know, apply and understand the matters, skills and processes specified in the relevant programme of study as well as model investigative skills they have learned and knowledge of how to develop, carry out and record experiments.

Key Stage 1

The main 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.

Pupils should read and spell scientific vocabulary at a level consistent with their reading and spelling knowledge at Key Stage 1 and model the ability to follow instructions to carry out simple investigations and use the vocabulary to explain what was done and why and simple results and conclusion.

Lower Key Stage 2 – Years 3 and 4

The main 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 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. 'Working scientifically' must **always** be taught through and clearly related to substantive Science content in the programme of study.

Pupils should read and spell scientific vocabulary correctly and with confidence, using their growing reading and spelling knowledge. They should also start to show the ability to develop science questions themselves and work, with the support of the teacher, to develop investigations and explain why the need to keep tests fair and discuss how they will keep tests fair. They should also be starting to discuss conclusions and linking them to previous knowledge to explain their findings.

Upper Key Stage 2 – Years 5-6

The main 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, they 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 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. Pupils should read, spell and pronounce scientific vocabulary correctly. Many of the investigations by the end of KS2 should be child led with the children deciding on what they want to investigate and why and explain what they think they will find. They will then independently display data in a variety of ways and explain what conclusions they have reached linking previous learning to their explanation.

'Working and thinking scientifically' must **always** be taught through and clearly related to substantive Science content in the programme of study.

Strategies

These aims and purpose are taught through the Cornerstones curriculum and focus on:

Engaging:

This gives the children chance to demonstrate what they know and investigate new ideas. Through practical tasks and discussion, children will be introduced to new knowledge and demonstrate the ability to model what they have learned and elicit information.

Developing knowledge:

During this process, the children take previous knowledge of a subject matter and what they have learned in the 'engage' part of the learning and further their understanding through research and investigation.

Innovating:

In this part of their learning in science, children will look at what they have learned and prove through investigation that the facts they have learned are true. The investigations will lead to alterations in their perceptions and have them question things they know.

And expressing their learning:

Children will explain what they have learned by linking the science topic they have been taught to previous learning and explaining how it pertains to real life and prove the knowledge is factually correct. They will also show that the knowledge they have gained is embedded so it can be used as they advance through primary and into secondary school.



Knowledge and Understanding

Children should:

Be curious about things they observe, experience and explore the world about them with all of their senses. 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 claims and ideas.

Learn and develop understanding through use of practical experiments.

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.
- Practical mathematical skills in real contexts.
- Learn why numerical and mathematical skills are useful and helpful to understanding.
- Understand why the government are working hard to promote health. To learn what they do now will benefit them in the future.

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 and extract information from sources such as reference books, CD-ROMs or 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 evidence available.
- Develop a respect for the environment and living things and for their own health and safety.
- Develop debating skills to question what they have been taught.

Organisation

Teachers are responsible for the teaching of Science. It is taught in units through a combination of whole class teaching, group and individual work **using the Cornerstones curriculum.**

Teachers will encourage our children to have skills of observation, discussion, debate and research.

In order to ensure the children receive a balanced science curriculum it is essential that elements from each of the Attainment Targets be taught each year, with particular emphasis on Scientific Investigation.

Children ideally should participate where appropriate in a practical activity so that they break away from too much writing but remember what they have learnt though completing practical tasks.

Scrapbooks to be used as a way of recording results, knowledge and information as well as a use of media and concept cartoons.

During the Foundation Stage children begin to explore the world around them, with specific Science work covered through the Early Learning Goal 'Knowledge and Understanding of the World'.

Throughout our Science teaching we hope that our children will develop a sense of awe and wonder about the world around them.

Marking Work

Refer to the whole School Marking Policy.

Assessment

Formative assessment is used to guide the progress of individual pupils in Science. It involves identifying each child's progress in each area of the Science curriculum, determining what each child has learnt and what therefore should be the next stage in his/her learning. Assessment to be at the end of the topic is through investigation and showing understanding of what has been taught and discussed through the process of child led learning and explanation. Teachers will then use their professional judgement to assess understanding of each pupil and record according to cornerstones criteria.



Suitable tasks include:

- Small group discussions, usually in the context of a practical task.
- Specific arrangements for particular pupils.
- Individual discussions in which children are encouraged to approve their own work and progress.
- Wherever possible experimental and investigative work should form the basis for the teaching of Science.
- Children should be given as many opportunities as possible to carry out investigations and experiments.

Progression

Planning in Science is a process, which involves all teachers. This includes:

- The School Improvement Plan is the foundation for curriculum planning, developed through collaboration between the staff, and approved by the governors.
- The school and governors have agreed on the use of Cornerstones Curriculum to plan, resource and assess learning.
- Each teacher is responsible for how they deliver each lesson, using cornerstones as a benchmark and ensuring all outcomes are met.
- Key Stage 1 is able to use single year group planning to deliver the Science curriculum. The Foundation Stage follow the Stepping Stones towards Early Learning Goals, which begins to develop children's awareness of Scientific understanding and investigation.

In order for children to make progress in Science, teaching should provide opportunities for children as they move through the Key Stages to progress:

- From using everyday language to increasingly precise use of technical and scientific vocabulary, notation and symbols.
- From personal scientific knowledge in a few areas to understanding in a wider range and of links between these areas.

Equal Opportunities

All children are entitled to access to the Science curriculum in line with the schools policy for equal opportunities. Children who show a particular ability and flair for Science, who work more quickly through the **Cornerstones curriculum are extended through the use of more challenging problems and investigations.**

More Able Children

Children showing particular strengths and talents in any aspects of English will be identified by the class teacher. Differentiation within the classroom will address the needs of more able learners and additional opportunities for extra-curricular experiences linked to English may be offered.

background.
All years should use the class website to extend on work in class for children to complete at home. Teachers to set the extra topics in the project area on the class site.

Special Educational Needs

All children are encouraged and supported to develop their full potential in Science.

Some children may require extra support in the classroom and opportunities for consolidation and reinforcement. Activities are differentiated to meet the needs of all pupils.

The Science co-ordinator is to:

- Take lead in policy development and the implementation of the Scheme of Work.
- Support colleagues in their development of work plans, and implementation of the Scheme of Work.
- Monitor the resources in Science and advise the Head Teacher of any action needed.
- Take responsibility for the purchase and organisation of central resources for Science.
- Keep up to date with developments in Science education and disseminate information to colleagues as appropriate.
- Monitor the teaching and learning of Science throughout the school.

Resources

Central resources in Science are the responsibility of the Science Co-ordinator who has a budget available.

Science equipment is audited annually. Consumables are replaced and discussions with staff determine if there are any other pieces of equipment required in order to enhance the teaching and learning of Science.

All Science equipment is stored in labelled containers.

Children are encouraged to value and take care of all equipment.



The Role of ICT

ICT is used to support our teaching and to motivate children's learning. The interactive whiteboards are used as a teaching tool, for writing information and for sharing texts, pictures, other children work and video clips. The wide variety of programmes we have available are also used to extend and reinforce children learning. The use of video, tablets, digital cameras and e-books are also becoming very much part of our curriculum.

The class website to include videos of what the children are learning with extension tasks incorporated.

Home / school links

St Mary's CE Farnham Royal values the relationship with parents in supporting their children's success. Parents are involved in their children's learning by:

Providing regular parent's evenings which give them verbal information on their child's progress and their targets for the future.

Management Information

Communication with staff is made through staff inset days, SMT meetings, weekly staff meetings and individual meetings with staff. Staff will report back on courses to whole staff, phases or individuals, as appropriate. Resources are located either in classroom or in communal areas. Resources are updated as needed.

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