



# Science Policy

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## **Roe Farm Primary School** **Science Policy**

### **1. Overview of School Context**

Roe Farm is a primary school for both boys and girls aged 3-11 years. Children come from a range of dual and single parent families and there is a wide variety of differing family backgrounds although the majority being from a white British setting . The school does have an increasing number of children from differing cultural backgrounds and religions. Throughout the school there are a number of children with a range of special needs.

### **2. Purpose**

Science is an inspiring, practical and systematic subject where we encourage children to be inquisitive throughout their time at the school and beyond. The Science curriculum fosters a healthy curiosity in children about our universe and promotes respect for the living and non-living. We believe science encompasses the acquisition of knowledge, concepts, skills and positive attitudes. Throughout the programmes of study, the children will acquire and develop the key knowledge that has been identified within each unit and across each year group, as well as the application of scientific skills. We ensure that the Working Scientifically skills are built-on and developed throughout children's time at the school so that they can apply their knowledge of science when using equipment, conducting experiments, building arguments and explaining concepts confidently and continue to ask questions and be curious about their surroundings.

We aim to provide a broad, scientific curriculum that develops scientific vocabulary and empowers children to ask scientific questions – this will enable children to make careful observations and decisions based on justifiable reasons. Maths links are made through science by improving data handling skills as well as being able to develop the recording of scientific experiments. Ultimately, we want children to enjoy learning all areas of 3 science and many topics will be covered on more than one occasion throughout their schooling in order to embed their knowledge.

### **3. Legal requirement**

The 2014 National Curriculum for science aims to ensure that all pupils:

- Develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics
- Develop 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

- Are equipped with the scientific skills required to understand the uses and implications of science, today and for the future. We understand that it is important for lessons to have a skills-based focus, and that the knowledge can be taught through this

**The following sections highlight Roe Farm Primary School's Science INTENT**

#### **4. Aims**

Science at Roe Farm primary school prepares children to take part in the development of

At Roe Farm Primary school we follow the National Curriculum for Science, ensuring that all pupils:

- Develop scientific knowledge and understanding through the disciplines of biology, chemistry and physics
- Develop their curiosity about what they observe, experience and explore and promote a desire to ask and answer scientific questions
- Plan and carry out scientific investigations
- Be able to select and use appropriate equipment safely and correctly
- Understand how science can be used to explain what is occurring and make predictions about how things will behave
- Evaluate and present their conclusions accurately and clearly
- Develop an understanding of the nature, processes and methods of science through different types of science enquiries that help them to answer questions about the world around them
- Equip themselves with the scientific knowledge required to understand the uses and implications of science today and for the future

Teachers create a positive attitude to science learning within their classrooms and reinforce an expectation that all pupils are capable of achieving high standards in science. Our whole school approach to the teaching and learning of science involves the following;

We aim to:

- The ability to think independently and raise questions about working scientifically and the knowledge and skills that it brings
- Confidence and competence in the full range of practical skills, taking the initiative in, for example, planning and carrying out scientific investigations

- Excellent scientific knowledge and understanding which is demonstrated in written and verbal explanations, solving challenging problems and reporting scientific findings
- High levels of originality, imagination or innovation in the application of skills
- The ability to undertake practical work in a variety of contexts, including fieldwork
- A passion for science and its application in past, present and future technologies.

- **Aims for Early Years Foundation Stage:**

During the Early Years Foundation Stage (EYFS) pupils explore and use a variety of media and materials through a combination of child initiated and adult directed activities. They have the opportunities to learn and explore:

- The natural world around them, making observations and drawing pictures of animals and plants
- Understanding some important processes and changes in the natural world around them, including the seasons and changing states of matter.
- Learn how to look after their bodies, including healthy eating and manage personal needs independently.
- Participate in small group, class and one-to-one discussions, offering own ideas, using recently introduced vocabulary (scientific)

- **Aims for Key Stage 1:**

- The principle 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.
- 'Working scientifically' is described separately in the programme of study, but must be taught through and clearly related to the teaching of substantive science content in the programme of study.
- Pupils should read and spell scientific vocabulary at a level consistent with their increasing word-reading and spelling knowledge at KS1.

- **Aims for Lower Key Stage 2:**

- The principle 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 relationship 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.

- ‘Working scientifically’ is described separately in the programme of study, but must be taught through and clearly related to the teaching of substantive science content in the programme of study.
- Pupils should read and spell scientific vocabulary correctly and with confidence.
- **Aims for Upper Key Stage 2:**
- The principle focus of science teaching in 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 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.
- ‘Working and thinking scientifically’ is described separately in the programme of study, but must be taught through and clearly related to the teaching of substantive science content in the programme of study.
- Pupils should read, spell and pronounce scientific vocabulary correctly and with confidence.

## 5. Breadth of study

At Roe Farm our Design and technology curriculum is designed to offer a breadth of learning that gives pupil the full span of knowledge of the subject. Curriculum drivers shape our curriculum breadth and are taken from an exploration of the backgrounds of our students, our beliefs about high-quality education and our values as a school. They are used to ensure we provide our pupils with appropriate and ambitious curriculum opportunities. Cultural capital gives our children the crucial background knowledge required to be informed and thoughtful members of our community who understand British values. The curriculum breadth is shaped by our curriculum drivers, cultural capital, subject topics and our aim for pupils to learn from theology developed by leading academics and scholars. Our curriculum distinguishes between subject topics and threshold concepts. Subject topics are the specific

aspects of that are studied. Threshold concepts tie together the subject topics into meaningful schema. The same concepts are explored in a wide breadth of topics. Through this fluidity of the curriculum, the children return to the same concepts repeatedly, and steadily build understanding of them. For each of the threshold concepts, three milestones (each of which features the procedural and semantic knowledge pupils need to understand the threshold concepts) provide a progression model. Design challenges gives pupils a way of expressing their understanding of the threshold concepts.

## 6. Planning

The Science Curriculum outlines three strands of learning (threshold concepts):

**Biology**– This concept involves developing the skills needed to make high quality products.

**Chemistry** – This concept involves appreciating the design process that has influenced the products we use in everyday life.

**Physics**- This concept involves developing the process of design thinking and seeing design as an iterative process.

Schemas of work are created using these threshold concepts, knowledge categories, appropriate design and technology vocabulary and through different aspects of Science to create knowledge webs for study with POP tasks to assist with monitoring progress.

**The following sections highlight Roe Farm Primary School's Science IMPLEMENTATION**

## 7. Curriculum time and provision

**EYFS 1 (Nursery):** Science is covered under 'Communication and Language, Personal, Social and Emotional Development and Understanding the World. Children will regularly engage in lessons structured using the three key thresholds.

**EYFS 2 (Reception):** Science is covered under 'Communication and Language, Personal, Social and Emotional Development and Understanding the World. Children will regularly engage in lessons structured using the three key thresholds.

**Key Stage One:** At least 2 hours per week.

**Key Stage Two:** At least 2 hours per week.

Following the Chris Quigley approach to Greater Depth, pupils will work on tailored milestones over a two year period in order to provide opportunities to consolidate and extend their learning in these areas.

Milestones are broken down with pupils working on the Basic Proof of Progress objectives in the first year, and progressing to Advance and Deep objectives in their second year.

## **8. Teaching and Learning Styles**

At Roe Farm Primary School, we acknowledge the range of learning styles of the children and aim to differentiate teaching styles to meet the needs of the children. We also recognise that children learn at different stages and we provide suitable learning opportunities for all children by matching the tasks to the ability of the child by:

- Setting open ended tasks which allow for a variety of outcomes at different levels.
- Grouping children in ways appropriate to tasks either by ability or by a mixed range of abilities together whilst also allowing them individual opportunities.
- Providing a range of resources to meet the ability and needs of the children, adapting them where necessary.
- Using support staff effectively within the classroom to support the learning and development of the children.
- Providing achievable and realistic goals for the children to achieve, and extending children to a higher level where appropriate.
- As part of our progression model, POP tasks are used which show our curriculum expectations in each cognitive domain and also removes the cap on learning by giving pupils the opportunity to pursue deeper learning in this more fluid system.

All schemas will take into account the knowledge as defined in the Programmes of Study and the skills and concepts as specified in the threshold concepts and Milestones for the relevant Key Stage and year group. All 3 threshold concepts will be covered in each schema. The knowledge categories and how progress is to be measured will be included in the planning with reference to the knowledge webs.

Teaching and Learning in science will be in line with the school's *Teaching and Learning Policy*, where provision is made for all learning styles. The science curriculum at Roe Farm Primary School is designed to provide children with rich learning opportunities that reflect the breadth and balance of contexts outlined in the National Curriculum.

As an integral part of the teaching and learning of science, children will be given the opportunity to plan and undertake investigations and communicate their findings in a variety of ways.

## **9. Resources**

We are fortunate to have a range of resources available to support the delivery of Science across the school. Most resources are owned by the school having been acquired over many years and cover all the aspects of Science including Biology, Chemistry and Physics.

Responsibility for the resourcing for science lies with the science coordinator in partnership with the class teachers. Decisions as to adding to the resources of the school are taken in co-operation with class teachers and the Head Teacher. Resources will be audited and checked on a half termly basis when planning is submitted, with stock replaced or new resources purchased based on budget limitations and requirements for the milestones and pop tasks. Some materials and resources need to be replenished on a yearly basis such as batteries, soil for plants, single use testing materials.

Resources are stored centrally in a specific room and by each different aspect of Science. Resources are organised based on the aspect that needs to be covered and staff are asked to ensure that all items are returned to the correct boxes promptly after use. It is the responsibility of all staff to ensure that resources are handled and cared for in a respectful manner. Science resources are stored in a secure environment and labelled boxes. These can be located in Y5/6 group room.

## **10. School Visits/Visitors**

Teachers are encouraged to take children on visits to support teaching and learning wherever possible. Visits will be planned in consultation with office staff and risk assessments completed to ensure the safety of the children.

Where possible, visitors are encouraged to come to school in order to discuss different aspects of Science at an age appropriate level with the children.

**The following sections highlight Roe Farm Primary School's Science IMPACT**

## **11. Assessment and Recording**

Assessment can be categorised in two ways; assessment for learning (formative) and assessment of learning (summative):

- Assessment for learning (AFL) is process by which assessment information is collected and used by teachers to adjust their short term teaching strategies. This might include but not

limited to, pupils' responses to questioning, outcomes from learning tasks, observations or through pupils' self-assessments. This method will form the basis of assessment of design and technology at Roe Farm Primary.

- Assessment of Learning (AOL) refers to strategies designed to confirm what pupils know. This is usually conducted through tests. Teacher assessment will be informed by the POP tasks included in the knowledge webs and the threshold milestones.

In line with the school's policy on assessment, teachers will record at the end of each academic year how well pupils have progressed towards their milestones using the O Track system. Assessment of children's learning will be continuous and centred on judgements teachers make about a child's attainment based on knowledge gained through techniques such as observation, questioning and marking alongside each term pupils will undertake scaled score progress tests produced by Head Start (Autumn term – Test A, Spring term – Test B and Summer term – Test C) Children will be encouraged to evaluate their own achievements and progress at intervals.

Parents will be informed of pupil's progress during termly parent's evening meetings and in their end of year report.

## **12. Monitoring and Assessment of Science Within School**

Monitoring of Science will take place in line with the schools monitoring policy. This will be conducted by the subject leader with the support of SLT. It should include the following each term:

- Learning Walk
- Book Look- where possible
- Looking at O'track data.
- Pupil discussions

Each year the subject leader should also:

- Review and audit Science resources
- Analyse milestone/curriculum coverage
- Conduct CPD audit and arrange training where required
- Review subject action plan and report to Curriculum Leader / Governors
- Engage with Link Governor when required including an annual subject progress review meeting.

### **13. Related Policies**

This policy should be viewed in partnership with the following additional policies:

- PSHE Policy
- Curriculum Policy
- Monitoring Policy
- Behaviour Policy
- Equal Opportunities Policy
- Anti-bullying Policy