

Lockington CE VC Primary School



Science Policy

Revised & Updated January 2022

Date Policy Formally Agreed By Governors:	17 th March 2022
Date Policy Becomes Effective:	Spring 2022
Review Date:	Autumn 2026
Person Responsible for Implementation and Monitoring:	Headteacher

1 Introduction

This policy outlines the organisation and management of science at Lockington CE VC Primary School. It has been written with regard to the requirements of the National Curriculum (2014) and the Early Years Foundation Stage Statutory Framework (2021),

It is written within the context of our school's mission statement:

'to develop lively, enquiring minds and promote outstanding standards of achievement in a happy, safe and caring environment, based on Christian values, which encourage all to show respect and understanding of others.'

It has also been written in the context of the school's Christian Vision:

'Let your light shine before others, that they may see your good works, and glorify your Father who is in heaven' (Matthew 5:16).

2 The Nature of Science

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. (National Curriculum 2014)

Science involves practical investigations, observations and collecting evidence to develop pupils' understanding of fundamental concepts. Science should always encourage creative and critical thought by encouraging children to engage in questioning, discussion and research about science-based issues which affect their lives now and in the future. Through their work in science, children will gain the knowledge and understanding to begin to make sense of phenomena and events in our world today.

At Lockington C.E. Primary School we value Science because:

- it makes an increasingly important contribution to all aspects of life,
- all children are naturally curious about their environment and Science makes a valuable contribution to their knowledge and understanding of God's world,
- it provides children with insights into the way science is applied and how science works in the community and it helps them to make informed decisions about scientific issues,
- it is important to enable children to actively learn by teaching them the skills they need to find answers to questions so as to increase their scientific knowledge.

3 Aims

At Lockington School we believe that as we live in an increasingly scientific and technological age where children need to acquire the knowledge, skills and understanding to prepare them for life in the 21st century. Through the framework of the National Curriculum (2014), science aims to:

- stimulate children's interest, enjoyment and creativity in the area of science,
- equip children to build upon their natural sense of wonder about the world,
- develop, through practical work, the skills of observation, prediction, investigation, interpretation, communication, questioning and hypothesising, and increase the use of precise measurement skills and ICT,
- support children to develop their skills of cooperation through working with others, and to encourage where possible, ways for children to explore science in forms that are relevant and meaningful to them,
- encourage children to collect relevant evidence, to question outcomes and to persevere,
- encourage children to treat the environment with respect and sensitivity,
- encourage children to raise questions and learn how to investigate and explore these using both first-hand experience and secondary sources,
- develop the ability to challenge one's own and other's ideas in both a practical and creative sense,
- help children understand the nature of scientific ideas and how to obtain and test evidence for them,
- help pupils recognise and assess risks and hazards when working scientifically and take action to control them,
- To embody principles of the distinctively Christian nature of our school in all aspects of learning.

The following objectives should be kept in mind when planning work:

- To give the opportunity, through investigation, to develop the ability to think and enquire purposefully and safely.
- To develop basic skills through observation, research and investigation.
- To use mathematical skills appropriate to age and ability and learn why these skills are important to find evidence.
- To develop an understanding of the processes which shape their surroundings.
- To develop the ability to use scientific and mathematical language to explain their findings.
- To enable all children to communicate their findings in a variety of ways, including the use of charts and diagrams.
- To provide opportunities for self-awareness and to develop attitudes of co-operation, understanding and respect for others.
- To provide opportunities to enhance speaking and listening skills.
- To promote the use and understanding of basic, precise scientific language.
- To enhance research skills using reference books, ICT and the internet, where applicable.

The 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 knowledge required to understand the uses and implications of science, today and for the future.

4 Teaching and Learning

The teaching of science should engender a variety of teaching and learning styles, all of which include elements of:

- development of scientific skills and routines,
- development of positive attitudes and open mindedness,
- discussion between pupil/peer and pupil/teacher,
- appropriate practical work,
- investigative work.

These elements can be incorporated in the teaching of science through;

- whole class discussion/ teacher demonstration,
- small group discussion/ investigation,
- individual investigation.

The planning and delivery of lessons should include elements of teaching styles to address all types of learners, e.g. the linguistic, the visual, the kinaesthetic, the auditory. The teaching of science should include development of the basic skills of mathematics, reading and writing.

The help of parents and other interested people will be encouraged and used where appropriate.

5 Science Timetable

KS1 – 1 ½ hours per week plus additional time allocated into other cross curricular opportunities.

KS2 – 2 hours per week plus time allocated into other cross curricular opportunities.

6 Science curriculum planning

Our whole school approach to planning is based on the National Curriculum (2014). Science encompasses the acquisition of knowledge, concepts, skills and attitudes. Through the programmes of study in the Science National Curriculum (2014), pupils will acquire and develop these skills throughout their primary years.

Children are taught in two mixed age classes:

- Reception and Key Stage 1
- Key Stage 2

Reception pupils are also taught through continuous provision.

Science topics are usually taught in half termly units to ensure curriculum coverage. Teachers use a variety of resources and planning documents to compile schemes of work, including Hamilton Trust resources. Children are taught in class groups and work is differentiated in a variety of ways so that all children access the curriculum, succeed and are challenged. Planning for science is a process in which all teachers are involved to ensure the school gives full coverage of the National Curriculum for Science, Development Matters and the Early Learning Goals (2021). We adapt and extend the curriculum to match the unique circumstances of our school.

The overall style of planning may differ slightly throughout the school, however, there is a generic format:

Long term: See Curriculum overview of units of study
Medium term: Includes brief outline of the lesson including main objectives.

7 Curriculum organisation

Early Years Foundation Stage

Science in nursery and reception is taught through the Early Learning Goal of 'The World', which falls under the 'Understanding the World' section of the EYFS curriculum. Children learn about similarities and differences in relation to places, objects, materials and living things. They talk about the features of their own immediate environment and how environments may vary from one another. They make observations of animals and plants and explain why some things occur, and talk about changes. In the EYFS Science is taught both through planned teaching and learning opportunities, offsite visits, workshops, responding to the children's individual interests and by providing the children with a carefully resourced multi-sensory learning environment both indoors and outside. Science themes throughout the year include the changing seasons, living creatures, growth and change, around the world and how things work.

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 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.

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, 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.

8 The Use of Technology

Computing enhances our teaching of science, wherever appropriate, in all key stages. Pupils are taught to use a range of digital equipment to support their scientific learning e.g. data loggers for accurate measurements and digital microscopes for close observation and programs such as Word and Excel are used to record results. Children use software, such as Purple Mash, to explore scientific concepts and processes in their work. Older children collect visual information to help them develop their ideas by using digital and video cameras, scanners and digital microscopes. The children also use the Internet, to find out more about the lives and works of famous scientists and their discoveries.

When considering its use, we take into account the following points:

- Any decision about using computing in a particular lesson or sequence of lessons must be directly related to the teaching and learning objectives for those lessons;

- Computing should be used if the teacher and/or the children can achieve something more effectively with it than without it;
- Teachers should use their judgement about when ICT tools should be used.

9 Cross-curricular links

English: Linking English and Science enhances both subjects. Techniques learnt in English can be practiced in science, for example; speaking & listening, group discussion and interaction and drama. Children are encouraged to link their non-fiction 'Instruction' and 'Recount' writing in English to their scientific method and report.

Maths: Pupils are progressively taught to use numbers, to handle data and to plot bar charts and line graphs. Some of the work/problem solving activities in maths lessons use examples from science. Practical mathematical skills such as measuring are also a vital scientific skill.

Geography: Skills taught and themes learned in Geography and Science can be closely linked. Geographical enquiry skills such as; analysing evidence and drawing conclusions, using secondary sources of information and using digital devices to help investigations are strengthened through the use of these skills in Science. The link between Science and Geography is becoming more and more important as the children learn about environmental change and sustainable development.

Personal, social and health education: Health education is taught as part of the units that cover curriculum areas such as life cycles, movement and feeding, living things, human nutrition, our bodies, evolution and inheritance and feeding and inheritance.

Spiritual, moral, social and cultural development: The teaching of science offers opportunities to support the social development of our children through the way we expect them to work with each other in lessons. Groupings allow children to work together, and give them the chance to discuss their ideas and feelings about their own work and the work of others. Their work in general helps them to develop a respect for the abilities of other children, and encourages them to collaborate and cooperate across a range of activities and experiences. The children learn to respect and work with each other and with adults, thus developing a better understanding of themselves. They also develop an understanding of different times and cultures, through their work on famous scientists.

10 Differentiation

We recognise that we have children of differing ability in all our classes, and so we provide suitable learning opportunities for all children by matching the challenge of the task to the ability of the child. We achieve this through a range of strategies:

- Setting common tasks that are open-ended and can have a variety of responses;
- Setting tasks of increasing difficulty;
- Grouping children by ability and setting different tasks for each group;

- Providing a range of challenges with different resources;
- Using additional adults to support the work of individual children or small groups.

11 Special Educational Needs and Disabilities and More Able Pupils

Appropriate adjustments will be made for pupils who have special educational needs or for those for whom science may create tensions with their values and belief systems. A differentiated approach will operate at the planning stage and be adjusted to suit the needs of individual pupils. Specific pupils' needs, will be provided for, in line with the schools' policy on SEND.

More able pupils will be given opportunities and tasks to maximise progression and development in science:

- Teachers to provide teaching and learning experiences that encourage pupils to think creatively, explore and develop ideas, and try different approaches. Pupils should be encouraged to set their own questions, offer ideas, suggest solutions or explanations, and reflect on what they have heard, seen or done in order to clarify their thoughts.
- Greater independence in working, e.g. a pupil to be able to carry out their own simple scientific enquiry.
- Avoid giving more able pupils additional writing tasks and encourage them instead to communicate their understanding in a variety of ways, giving them responsibility for choosing and evaluating the most appropriate method.
- Provide opportunities within science for pupils to develop their skills in other areas, such as intrapersonal skills (for example, opportunities to use initiative), and interpersonal skills (for example, leadership and group membership). These opportunities also relate to the key skills of working with others and improving own learning and performance.

12 Equal Opportunities

All pupils should have equal access to the curriculum, irrespective of particular circumstances such as race, background, gender and capability. In science we support children in a variety of ways, such as speaking clearly, repeating instructions, emphasising key words, using picture cues and adapting resources where necessary. The teaching of science is in accordance with our policy for Equal Opportunities.

13 Assessment

Science is taught over blocks of approximately six weeks. During the block, children will develop a variety of skills such as investigation, observation, recording, measuring and fair testing. These skills will be assessed throughout the six weeks at various opportunities to form on-going teacher assessment based on teacher observation and continuous assessment. Records kept on the school tracking system should be updated each half term. Children are encouraged to respond to marking and comment on their learning. More formal methods of assessing science also help

to provide more evidence of attainment. This could happen at the end of the unit that has been studied.

Teachers will make a formal assessment of the children's work at the end of KS1 and KS2.

14 Resources

There is a central resource area providing both basic and specialised equipment and materials for the whole school. Topic boxes are situated in the corridor and further equipment is stored within KS1 and KS2 classrooms. All equipment should be returned to its place of storage in a state suitable for use by the next member of staff. Shortages and breakages should be reported to the science leader for replacement. A range of pupils' reference books is kept in the library, supplemented by library loans.

15 Science Learning Environment

Science is promoted and valued throughout the school. Science work is displayed both in classrooms and on display boards in the corridor. Work and learning experiences are shared on the school website. Individuals and groups may be mentioned and celebrated during the weekly 'Good Work Assembly'.

16 Parental Involvement

We encourage parents to be involved in the science curriculum by:

- inviting them into school each term to discuss the progress of their child and look at their child's work,
- encouraging parents to be involved in homework activities and making the learning objectives and the task clear and achievable,
- encouraging any parents who are scientists, or interested in science, to come in to work with the children.

17 Homework

It is our policy to provide parents and carers with the opportunity to work with their children at home.

18 Health and Safety Issues:

At all times, children will be taught how to care for and handle equipment safely and with respect. Children will be shown how to use scientific equipment safely. Safety glasses will be used where appropriate. When working practically and in different environments, including those that are unfamiliar, pupils will be taught:

- about hazards, risks and risk control,
- to recognize hazards, assess consequent risks and take steps to control the risks to themselves and others,

- to use information to assess the immediate and cumulative risks,
- to manage their environment to ensure the health and safety of themselves and others,
- to explain the steps they take to control risk.

19 Roles and Responsibilities

The Governing Body determines, supports, monitors and reviews the school science policy. We have an identified governor for science. The governor is informed of progress in the subject by the subject leader.

The Headteacher's role is to:

- provide support by encouraging staff and praising good practice,
- monitor learning and teaching through lesson observations,
- monitor planning and reviews,
- give feedback to teachers following lesson observations;
- support staff development through in service training and provision of resources,
- observe colleagues with a view to identifying the support they need.

The science subject leaders' role is to:

- provide a strategic lead and direction for science in the school,
- provide support and advice to staff in the delivery of the science programme of study,
- remain informed about current developments in the subject by attending CPD sessions and being involved in independent research and reading,
- deliver CPD sessions to staff, to support staff development and lead by example by setting high standards in their own teaching,
- liaise with other members of staff to form a coherent and progressive scheme of work,
- monitor standards in the subject,
- consider with staff and work with the Headteacher in the evaluation and planning of actions included within the School Development Plan,
- take responsibility for the choice, purchase and organisation of central resources for science, in consultation with colleagues.

Moderating the standards of children's work and of the quality teaching in science is the responsibility of the science subject leaders along with the Headteacher.

As well as regular updates, the science subject leaders give the Headteacher an annual report in which s/he evaluates strengths and weaknesses in the subject and indicates areas for further improvement.

The subject leaders will be responsible to the Headteacher and will liaise with the named link Governors.

The class teacher's role is to:

- be responsible for the teaching of science as set out in the policy,

- provide planning and reviews for the Head Teacher and science leaders to have access to,
- provide samples of art work to the science leaders/Headteacher when required,
- assess children's work in order to detail future planning,
- update skills, knowledge and understanding of science,
- identify inset needs in science and take advantage of training opportunities,
- keep appropriate on-going records in relation to school policy.

22 Review

This policy will be reviewed during the Autumn Term 2026.

Person responsible: Science Subject Leaders

Date reviewed January 2022

Signed:  _____ (Chair of Governors)

Signed:  _____ (Headteacher)