St. Giles' C of E Primary School
Science Policy

Our Science Vision

At St Giles we believe that Science should be practical, fun and adventurous. Science should stimulate and excite pupils' curiosity about the natural phenomena and events in the world around them. It should also satisfy their curiosity with knowledge, concepts and possibilities and engage learners at many levels. Children should be made aware of any major scientific developments that may affect their own lives, future career decisions and the direction of society and the future of the world.

Science has changed our lives and is vital to the world's future prosperity. At St Giles, we work hard to provide a rich and varied curriculum to challenge and meet the needs of our children and distil a lifelong love of science within our pupils.

We recognise that it is vital that children have access to a high quality, broad and balanced Science curriculum. Our curriculum aims to ensure that all pupils develop progressive, scientific enquiry skills across all key stages within the strands of Science. We have a clear progression of skills **(Appendix 1& White Rose Science Skills Mapping.pdf)** which teachers follow in their planning and the children are given opportunities to reflect and build on their prior knowledge. Our planning aims to develop independent learning skills through opportunities to ask questions, design investigations and measure results. At St Giles, the children are exposed to the full range of scientific enquiry types and are encouraged to ask questions about the world around them. Teachers make links between Science and the 'bigger picture' and the children are informed of the role that science plays in their daily lives.

Furthermore, through our Science lessons, we aim to provide the children with skills that they can utilise across the curriculum and in their lives. Cross curricular links are developed with Maths, PSHE, Computing, Geography and History and there is coherence in the way science fits into our overall approach.

Intent

The Scientific area of learning is concerned with increasing pupils' knowledge and understanding of our world, and with developing skills associated with Science as a process of enquiry. It will develop the natural curiosity of the child, encourage respect for living organisms and the physical environment and provide opportunities for critical evaluation of evidence.

At St Giles Primary School, in conjunction with the aims of the National Curriculum, our Science teaching offers opportunities for children to:

- 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.
- be equipped with the scientific knowledge required to understand the uses and implications of Science, today and for the future.
- develop the essential scientific enquiry skills to deepen their scientific knowledge.
- Use a range of methods to communicate their scientific information and present it in a systematic, scientific manner, including I.C.T., diagrams, graphs and charts.

- Develop a respect for the materials and equipment they handle with regard to their own, and other children's safety.
- Develop an enthusiasm and enjoyment of scientific learning and discovery.

Implementation

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

● Science will be taught in planned topic blocks by the class teacher. This is to enable the achievement of a greater depth of knowledge.
● Through our planning, we involve problem solving opportunities that allow children to apply their knowledge and find out answers for themselves. Children are encouraged to ask their own questions and be given opportunities to use their scientific skills and research to discover the answers. This curiosity is celebrated within the classroom. Planning involves teachers creating engaging lessons, often involving high-quality resources to aid understanding of conceptual knowledge. Teachers use precise questioning in class to test conceptual knowledge and skills and assess pupils regularly to identify those children with gaps in learning, so that all pupils keep up.
● We build upon the knowledge and skill development of the previous years. As the children's knowledge and understanding increases, and they become more proficient
in selecting, using scientific equipment, collating and interpreting results, they become increasingly confident in their growing ability to come to conclusions based on real evidence.
● Working Scientifically skills are embedded into lessons to ensure these skills are being developed throughout the children's school career and new vocabulary and challenging concepts are introduced through direct teaching. This is developed through the years, in-keeping with the topics.
● Teachers demonstrate how to use scientific equipment, and the various Working Scientifically skills to embed scientific understanding. Teachers find opportunities to develop children's understanding of their surroundings by accessing outdoor learning and workshops with experts.
● Children are offered a wide range of extra-curricular activities, visits, trips and visitors to complement and broaden the curriculum. These are purposeful and link with the knowledge being taught in class.
● Regular events, such as Science Week, allow all pupils to come off-timetable, to provide broader provision and the acquisition and application of knowledge and skills. These events often involve families and the wider community.

Impact
The successful approach at St Giles results in a fun, engaging, high-quality science education, that provides children with the foundations and knowledge for understanding the world. Our engagement with the local environment ensures that children learn through varied and first-hand experiences of the world around them. Through various workshops, trips and interactions with experts and local charities, children have the understanding that science has changed our lives and that it is vital to the world's future prosperity. Children learn the possibilities for careers in science, because of our community links and connection with national agencies such as the STEM association. Children at St Giles enjoy science, and this results in motivated learners with sound scientific understanding.

Teaching and Learning

From past INSET and training, teachers have discussed 'What makes science good?' and we have imbedded this into our science teaching at St Giles.

Science is good when:

● ‘Working Scientifically skills’ are applied to solve problems, explore, observe and investigate.

● Children and Teachers ask questions and work together to discover the answers.

● Science has a wow factor and promotes a sense of awe and wonder.

● Learning is enhanced by outdoor experiences, specialist visitors and access to good quality resources.

● Children are involved in creating and carrying out investigations and can share and explain their ideas and conclusions.

Questions

At St Giles, children are encouraged to ask their own questions and be given opportunities to use their scientific skills and research to discover the answers. This curiosity is celebrated within the classroom.

Teachers ask a range of questions which enable all children to take part, listening carefully to answers and taking learning forward, using open and closed questions and allowing children time to think. Planning involves teachers creating engaging lessons, often involving high-quality resources to aid understanding of conceptual knowledge. Teachers use precise questioning in class to test conceptual knowledge and skills and assess pupils regularly to identify those children with gaps in learning, so that all pupils keep up.

Vocabulary

New vocabulary and challenging concepts are introduced through direct teaching. This is developed through the years, in-keeping with the topics. Each new topic has a new glossary of key vocabulary which is stuck into each pupil’s exercise book and referred to during lessons.

Working Scientifically

Working Scientifically skills are embedded into lessons to ensure these skills are being developed throughout the children’s school career. Teachers are aware of the progression throughout KS1 and KS2 and this is stuck into the pupil’s exercise books so they are aware of the skills they will be learning.

Teachers demonstrate how to use scientific equipment, and the various Working Scientifically skills to embed scientific understanding.

Scientific knowledge and conceptual understanding

The programmes of study describe 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 area of knowledge and concepts to progress to the next stage. Children’s starting points are identified at the beginning of each science topic and the children can convey and record what they know already. At the end of the block, children’s knowledge is checked in line with the key knowledge identified prior to the teaching block. 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 and teachers ensure that this is developed within each lesson and throughout each science topic. The science curriculum ensures that children are provided with regular opportunities to 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 and this is embedded within lessons and focuses 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 include: observing over time; pattern seeking; identifying, classifying and grouping; comparative and fair testing (controlled investigations); and researching using secondary sources. Pupils are given opportunity to seek answers to questions through collecting, analysing and presenting data.

All classrooms have these scientific enquiry approaches on display and refer to them when teaching.

Spoken language

The national curriculum for science reflects the importance of spoken language in pupils' development across the whole curriculum – cognitively, socially and linguistically. At St Giles science lessons provide a quality and variety of subject specific language to enable the development of children's confident and accurate use of scientific vocabulary and their ability to articulate scientific concepts clearly and precisely. They are encouraged and assisted in making their thinking clear, both to themselves and others, and teachers ensure that pupils build secure foundations by using discussion to probe and remedy their misconceptions.

Planning and resources:

KS1 and KS2

To provide adequate time for developing scientific knowledge, skills and understanding, each teacher will provide weekly Science lessons. These may vary in length but will usually last for one hour in both KS1 and KS2.

Planning is a process in which all teachers are involved. Planning should be done with parallel year group teachers.

Planning in Key Stages 1 and 2 follows the New Curriculum 2014 guidelines for Science and uses the White Rose scheme of work to implement the new curriculum. This informs our Medium Term and weekly planning. A long-term overview of the curriculum is included in the policy. **Science Overview.pdf**

Further evidence of 'good science' taking place in classrooms includes:

● An active learning environment, with relevant Working Scientifically posters on the working walls during science topic coverage as well as key vocabulary and knowledge.

● Children being encouraged to ask and answer questions and discuss their work and ideas.

● Children devising and conducting their own investigations within the context of the relevant curriculum content, as well as being given opportunities to develop their working scientifically skills.

● Children recording their findings in a variety of ways.

● Children showing enjoyment in the activities they are undertaking.

● The cross curricular teaching of science.

Science in the Foundation Stage

Nursery/Reception: Topics are covered using a topic-based approach using the Cornerstones scheme of work. Science activities form an integral part of the afternoon lessons and form part of the 'Understanding of the World' curriculum.

Resources

We have sufficient, high-quality science resources to aid and support the teaching of all units and topics taught, from EYFS to Y6. We keep these in a central store, where they will be labelled and easily accessible to all staff. The main Science resources are stored in the Year 2 classroom next to the staff room, labelled up in drawers. Other resources can be found in the science cupboard in the Computing Suite.

Class teachers are responsible for signing in and out Science equipment and returning it when they have finished using it. Any damaged equipment should be reported to the Science co-ordinator as soon as possible. Consumable items, such as batteries, should be tested before the start of a topic and reported/replaced as necessary.

We aim to ensure that the quality and availability of resources is maintained and that children should value the school's equipment. As funding allows, the range of resources will be updated and extended as necessary.

EYFS have a range of resources kept in classes, for simple access for children during exploration. The library contains a good supply of science topic books to support children's individual research.

Assessment

Children's progress is continually monitored throughout their time at St Giles Primary School and is used to inform future teaching and learning. 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 set out in the National Curriculum. These are set out as statutory requirements. We also draw on the non-statutory requirements to extend our children and provide an appropriate level of challenge. Children receive effective feedback through teacher assessment, both orally and through written feedback.

Assessment for learning is continuous throughout the planning, teaching and learning cycle. However, children are more formally assessed half termly in KS1 and KS2 using a variety of methods:

- Observing children at work, individually, in pairs, in a group, and in classes.
- Questioning, talking and listening to children.
- Considering work/materials / investigations produced by children together with discussion about this with them.
- End of topic assessment tests (SOW resource).

In EYFS, we assess the children's Understanding of the World according to the Development Matters statements and some aspects of Expressive Arts Design are also science based.

Assessment Data

Half-termly after the children have been more formally assessed, class teachers will record progress data on the school tracking system – Educater. Children will be given an ARE judgement (Emerging, Developing, Secure) based on their knowledge and understanding and their working scientifically skills.

The contribution of Science to teaching in other curriculum areas

The teaching of Literacy, Maths, Computing and PSHE is promoted strongly throughout Science teaching.

Literacy

At Key Stage 1, the pupils are encouraged to use their speaking and listening skills to describe what they see and explain what they are going to do next.

At Key Stage 2 the pupils are encouraged to develop their skills of writing to record their planning, what they observe and what they found out. In relation to science, they should be applying their literacy skills at levels like those which they are using in their English work.

Maths

At both key stages the pupils are expected to use their knowledge and understanding of measurement and data handling at appropriate levels. In science, they should be applying their mathematical skills at levels like those which they are using in their mathematics' lessons.

Computing

The pupils' Computing skills are applied as identified in the medium-term planning. At both key stages this involves the pupils using ICT to: locate and research information (internet); record findings (using text, data and tables); log changes to the environment over time (Data loggers); gain confidence in using calculators, digital cameras, and tablets, as well as the computer. The use of this equipment is indicated in medium-term planning and must be used. It forms an important part of the entitlement of all pupils in Computing.

Personal, Social and Health Education

Health education is taught as part of the units on ourselves, health and growing, teeth and eating, moving and growing, keeping healthy and life cycles. There are important links to be made with the new RSE Curriculum (2020).

Health and Safety in Science

Safe practice must be always promoted. Teachers must also consider the school's Health and Safety policy. Particular attention must be given to avoiding the use of anything that aggravates individual pupils' allergies. Safety issues are identified in medium-term planning through 'Switched on Science' and risk assessments should be completed in weekly planning, when activities are identified that are unusual and beyond the scope of normal safety practice.

Inclusion (e.g. EAL/SEN/PPG/Provision for GD pupils)

Teachers will include all children in the weekly Science lesson. All children will benefit from aspects of the lesson, such as discussion, and other children communicating and sharing ideas. We aim to meet the needs of all our children by differentiation in our science planning and in providing a variety of approaches and tasks appropriate to ability levels.

SEND pupils

This involves providing opportunities for SEND children to complete their own projects, with support, to develop speech and language skills, as well as scientific skills and knowledge. This will enable children with learning and/or physical difficulties to take an active part in scientific learning and practical activities and investigations and to achieve the goals they have been set. Some children will require closer supervision and more adult support to allow them to progress so a pupil whose difficulties are severe may need to be supported by a Teaching Assistant in addition to appropriately differentiated tasks given by the teacher. Further advice and support in teaching children with S.E.N can be obtained by the SENCO and Science Coordinator.

EAL Learners

Teachers should plan language opportunities for all children but make specific reference to EAL learners. Pictures/Visual aids should be used wherever appropriate to reinforce understanding of language taught.

Greater Depth Pupils

More able children will be challenged and motivated by differentiated work given by the teacher appropriate to his/her needs. Teachers will also use questions that allow the more able child to maintain their involvement in the lesson and demonstrate their knowledge and abilities By being given enhancing and enriching activities, greater depth children will be able to progress to a higher level of knowledge and understanding appropriate to their abilities.

Equal Opportunities (e.g. Gender, race)

At St Giles Primary School we are committed to providing all children with an equal entitlement to scientific activities and opportunities regardless of race, gender, culture or class.

Monitoring and Review

Science is regularly monitored and reviewed through the School Improvement process by SLT and the subject lead. Not all aspects of monitoring methods take place each year but they include:

- *Book trawls*
- *Pupil Interviews*
- *Lesson observations*
- *Planning checks*
- *Learning Walks*

Role of the Subject Leader

It is the responsibility of the subject leader along with SLT to monitor the standards of children's work. The subject leader is also responsible for supporting colleagues in their teaching, for being informed about current developments in the subject, and for providing a strategic lead and direction for science in the school. The subject leader monitors the budget, resources, and science topics and liaises with SLT and the business manager to books trips and workshops to support learning. The subject leader has specially allocated time for fulfilling the task of reviewing samples of children's work, training, liaising with other subject leaders from other schools and organising science week. The subject coordinator is responsible for reporting to the governors' curriculum committee about the quality of its implementation and its impact on standards.

Parents (Including Homework)

Parental input is highly valued and parents are regularly invited and welcomed into school to share their own expertise with the children. Children may receive science homework based on their current topic.

Policy renewal

Date of Policy: March 2025

Policy Review Date: March 2027

Appendices

Appendix 1

Working Scientifically

Progression Year by Year (KS1)

Working scientifically: this must be taught through the teaching of science content in the programme of study.

Describe and evaluate ideas

KS1	**observing changes over time** **noticing similarities, differences and patterns**
Year 1	To be able to say what is happening.
Year 2	Notice differences, similarities and patterns. Observe simple changes over time.

Ask questions

KS1	**ask their own questions about what they notice**
Year 1	Use sentence stems to prompt questions.
Year 2	Greater independence in asking **relevant** questions.

Using scientific equipment

KS1	**use different types of scientific enquiry to gather and record data, using simple equipment where appropriate, to answer questions including:**
Year 1	Non-standard methods of measuring. Comparative statements. (Longer/shorter, heavier/lighter)
Year 2	Standard methods of measuring – rulers, metre sticks, measuring cylinder.

Recording data

KS1	**grouping and classifying things** **carrying out simple comparative tests**
Year 1	Recording in tables and sorting diagrams.
Year 2	Venn diagrams and simple bar charts.

Present findings and draw conclusions

KS1	**finding things out using secondary sources of information**
Year 1	Use a simple sentence to conclude what has been found out.
Year 2	Adding more detail/an explanation to the conclusion.

Using scientific language

KS1	**use appropriate scientific language from the national curriculum to communicate their ideas in a variety of ways, what they do and what they find out.**
Year 1	Key vocabulary to be used with teacher prompting.
Year 2	Key vocabulary to be used with teacher prompting, verbally and in written explanations.

Progression Year by Year (LKS2)

Describe and evaluate ideas

KS2	**The pupil can describe and evaluate their own and other people's scientific ideas related to topics in the national curriculum (including ideas that have changed over time), using evidence from a range of sources.**
Year 3	Make basic predictions and compare them to outcomes.
Year 4	Identify prior misconceptions through further understanding.

Ask questions

KS2	**The pupil can ask their own questions about the scientific phenomena they are studying, and select and plan the most appropriate ways to answer these questions, or those of others, recognising and controlling variables where necessary - 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.**
Year 3	Ask more specific questions with greater detail. Begin to observe changes over time and begin to group and classify.
Year 4	With guidance choose ways to answer these questions. Notice patterns when you group, classify or observe changes over time.

Using scientific equipment

KS2	**The pupil can use a range of scientific equipment to take accurate and precise measurements or readings, with repeat readings where appropriate.**
Year 3	More accurate measurements including temperature and time.
Year 4	Use of data loggers and newton metres. Begin to use electrical circuits.

Recording data

KS2	**The pupil can record data and results using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs**
Year 3	Tables, bar charts and scientific diagrams e.g electrical circuit, labelled diagram.
Year 4	Classification (branching) key and line graphs.

Present findings and draw conclusions

KS2	**The pupil can present findings and draw conclusions in different forms, and raise further questions that could be investigated, based on their data and observations.**
Year 3	Begin to use scaffolding, to produce a conclusion and simple evaluation. Begin to present in different ways.
Year 4	With scaffolding, to produce a conclusion and evaluation with greater scientific detail, presented in different ways, making links beyond the classroom.

Using scientific language

KS2	**The pupil can use appropriate scientific language and ideas from the national curriculum to explain, evaluate and communicate their methods and findings**.
Year 3	Use the glossary to make suggestions and improve their understanding on appropriate words to use.
Year 4	Use the glossary to select appropriate words to demonstrate their understanding.

Progression Year by Year (UKS2)

Describe and evaluate ideas

KS2	**The pupil can describe and evaluate their own and other people's scientific ideas related to topics in the national curriculum (including ideas that have changed over time), using evidence from a range of sources.**
Year 5	Discuss results and evaluate outcomes and begin to make connections across topics.
Year 6	Critical analysis of findings from a range of sources. Observe any changes over time.

Ask questions

KS2	**The pupil can ask their own questions about the scientific phenomena they are studying, and select and plan the most appropriate ways to answer these questions, or those of others, recognising and controlling variables where necessary - 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.**
Year 5	Select and plan appropriate ways to answer questions. Carry out comparative and fair tests.
Year 6	Recognise and control variables where necessary. Use secondary sources of information to inform conclusions.

Using scientific equipment

KS2	**The pupil can use a range of scientific equipment to take accurate and precise measurements or readings, with repeat readings where appropriate.**
Year 5	Decimal conversion. Use of ICT to record results. Repeat readings.
Year 6	Selecting appropriate recording and measuring equipment based upon prior knowledge and understanding.

Recording data

KS2	**The pupil can record data and results using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs**
Year 5	Use a range of ways to record. Scatter graphs.
Year 6	Independently use a range of ways to record.

Present findings and draw conclusions

KS2	**The pupil can present findings and draw conclusions in different forms, and raise further questions that could be investigated, based on their data and observations.**
Year 5	Conclude and evaluate with some detail, raise further questions and present findings in different ways.

Year 6	Conclude and evaluate with more detail, raise further questions and have more independence and choice in presenting findings.

Using scientific language

KS2	**The pupil can use appropriate scientific language and ideas from the national curriculum to explain, evaluate and communicate their methods and findings**.
Year 5	Beginning to use scientific language to explain and evaluate their findings.
Year 6	Consistently use scientific language to explain and evaluate their findings. Research scientific vocabulary.