



Science Policy

This policy represents the agreed principles for the teaching of Science throughout the school. This policy has been agreed by Governors within the school and all Class Teachers representing the Early Years Foundation Stage, Key Stage 1 and Key Stage 2.

School aims

Our school community (children, staff, parents and governors) aims to:

- Learn and grow together within a safe, caring and happy environment
- Continually encourage achievement in all aspects of school life
- Motivate all children with a broad and challenging curriculum
- Treat everyone with honesty, respect and tolerance
- Ensure opportunities for all by providing equal access to learning

The National Curriculum 2014 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.

At Shepherd Primary, we recognise that 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. Children should be encouraged to understand how Science can be used to explain what is occurring, predict how things will behave, and analyse causes.

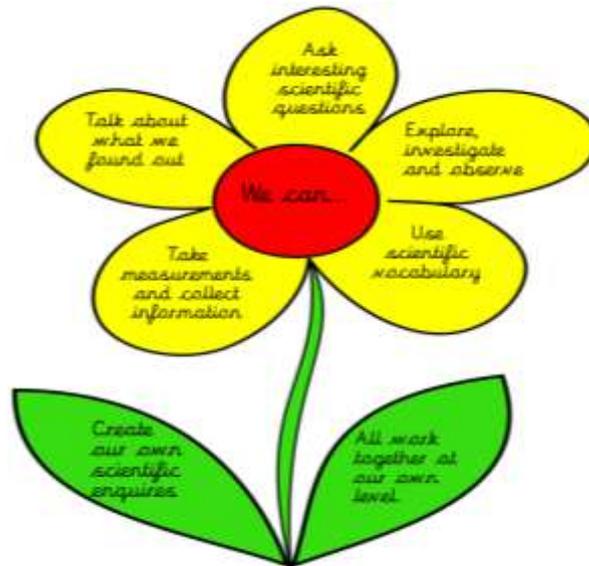
'Working scientifically' specifies the understanding of the nature, processes and methods of science for each year group - it should not be taught as a separate strand. 'Working scientifically' focusses on the key features of scientific enquiry, so that pupils learn to use a variety of approaches to answer relevant scientific questions. There are five types of scientific enquiry:

- observing over time
- pattern seeking
- identifying, classifying and grouping
- comparative and fair testing (controlled investigations)
- researching using secondary sources.



Our school vision for Science was created by the staff team and in consultation with our pupil Stem Ambassador group to support our commitment to scientific enquiry, inclusion and creating a positive and enriching science teaching. It is reviewed annually.

At Shepherd Primary School, We aim to promote a love of Science! We strive to engage all children in real life experiences to explore, ask questions and work together scientifically, with an inclusive approach. The children are given a rich and varied curriculum and are encouraged to challenge and question their own understanding.



Approaches to teaching and learning

We use a variety of teaching and learning styles in Science lessons. Our principal aim is to develop children's knowledge, skills and understanding. Sometimes we do this through whole-class teaching, while at other times we engage the children in an enquiry-based research activity. We encourage the children to ask, as well as answer, scientific questions. They have the opportunity to use a variety of data, such as statistics, graphs, pictures and photographs. Children use computing skills in Science lessons because it enhances their learning. Sometimes children may take part in role-play and discussions, as well as having opportunities to present reports to the rest of the class. Children regularly engage in a wide variety of problem-solving activities. Wherever possible, we involve the pupils in real-life scientific activities, for example investigating a local environmental problem, or carrying out a practical experiment and analysing the results.

We recognise that in all classes children have a wide range of scientific abilities, and we ensure that we provide suitable learning opportunities for all children by matching the challenge of the task to the ability of the child. We achieve this in a variety of ways:

- Setting tasks which are open-ended and can have a variety of responses
- Setting tasks of increasing difficulty (we do not expect all children to complete all tasks)
- Grouping children by mixed ability to support the needs of individuals and encourage greater opportunities for SEND children to have a role in investigations.
- Offering different tasks for each ability group but making sure the learning objective is maintained, ensuring that there is appropriate challenge for those more able pupils.



- Providing resources of different complexity, matched to the ability of the child

Science and Inclusion

At our school we teach Science to all children, whatever their ability and individual needs. Science forms part of the school curriculum policy to provide a broad and balanced education to all children. Through our Science teaching we provide enjoyable and engaging learning opportunities that enable all pupils to make good progress. We strive hard to meet the needs of those pupils with special educational needs, those with disabilities, those with special gifts and talents, and those learning English as an additional language, and we take all reasonable steps to achieve this. For further details see individual whole-school policies: Special Educational Needs; Gifted and Talented; English as an Additional Language; Inclusion.

We enable all pupils to have access to the full range of activities involved in learning Science. Where children are to participate in activities outside the classroom (a trip to a science museum for example) we carry out a risk assessment prior to the activity, to ensure that it is safe and appropriate for all pupils.

Time allocation

- In the Foundation Stage, Science is taught through child initiated learning in addition to focused session linked to 'Understanding the World'. Children are encouraged to explore their environment and investigate how things work around them.
- At Key Stage 1 (Year 1 and 2) children have a minimum of 1 hour discrete Science teaching per week. Teaching should enhance the children's scientific knowledge and scientific enquiry skills. Where possible cross curricular links should be encouraged.
- At Key Stage 2 (Year 3-6) children have a minimum of 1 ½ hours discrete Science teaching per week. Teaching should enhance the children's scientific knowledge and scientific enquiry skills. Where possible cross curricular links should be encouraged.

Science curriculum planning

We carry out our curriculum planning for Science in two phases (long term and medium term). The Long Term Plan (LTP) maps the scientific topics studied in each term during each Key Stage, according to the range of units identified in each year. These units of work are aligned to ensure cross-curricular links are best made to enrich and broaden the curriculum. In some cases, we combine scientific study with work in other subject areas, especially at the Early Years Foundation Stage; at other times the children study Science as a discrete subject. We use the local environment of our school wherever possible to enrich the children's experiences, for example in our fieldwork.

The Long Term Plan (LTP) also sets out the National Curriculum statutory requirements in terms of subject knowledge and unit specific skills which can then be applied to the learning objectives in the



Medium Term Plans. The detailed LTP for Science can be found in the Subject Leader's Science folder. The units covered in each year groups are arranged as follows:

Term	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Autumn	Everyday Materials (Objects & Materials) Seasonal Changes (Weather & Seasons) (Taught across the year in each term)	Living Things & Their Habitats (Living, Dead, Never Alive, Habitats) Plants (Seeds & Bulbs)	Light (Shadows & Reflection) Plants (Parts & Growth)	Animals Including Humans (Digestion, Teeth & Food Chains) Living Things & Their Habitats (Classification & Human Effect on Environment)	Earth & Space (Solar System, Movement of the Moon, Day & Night) Forces (Gravity, Friction & Mechanisms)	Animals Including Humans (Circulation & Health)
Spring	Animals Including Humans (Common Animals, Plants & Diets)	Uses of Everyday Materials (Materials for Different Uses)	Forces & Magnets (Movement & Magnets) Rocks (Types, Fossils & Soil)	Electricity (Circuits & Components) Sound (Vibrations & Features)	Properties & Changes of Materials (Dissolving, Reactions & Separation)	Evolution & Inheritance (Evolution, Adaptation & Inheritance) Living Things & Their Habitats (Classification: Plants, Animals & Microbes)
Summer	Plants (Wild & Garden)	Animals Including Humans (Growth, Survival & Health)	Animals Including Humans (Food, Diet, Skeletons & Muscles)	States of Matter (Solid, Liquid, Gas)	Living Things & Their Habitats (Life Cycles, Reproduction of Plants & Animals) Animals Including Humans (Growth, Development & Puberty)	Electricity (Changing Circuits and Symbols) Light (How Light Travels)

Contribution of Science to teaching in other curriculum areas

The core skills developed through Scientific enquiry can be applied in other aspects of the curriculum. Skills such as questioning, researching and evaluation of findings can be both enhanced and given purpose through cross curricular links. Some subjects have more specific links.

Science and computing

- Software is used to animate and model scientific concepts, and to allow children to investigate processes which it would be impracticable to do directly in the classroom.



- Data loggers are used to assist in the collection of data and in producing tables and graphs.
- Digital cameras and microscopes are used to record, present and interpret data; to review, modify and evaluate their work; and to improve its presentation.
- Children learn how to find, select and analyse information on the Internet and on other media.

Science and English

- Rich and relevant topic vocabulary is taught enhancing the children's writing both within a Scientific context and when writing on related topics.
- Opportunities for reading both fiction and non-fiction texts teach the children about the range of contexts through with Science has relevance.
- Research skills are enhanced through interpreting texts, data and use of the internet.
- Different styles of writing are developed, e.g. persuasive texts linked to a scientific finding; note taking; analysis of data; reporting.
- Opportunities to communicate with others, and present findings and information to an audience. This may include drama and debates.

Science and Mathematics

- Estimating and prediction outcomes linked to scientific knowledge.
- Measuring and recording data using a range of tools such as tape measures, data loggers, thermometers, stop watches.
- Presenting results in graphs and tables (at an age appropriate level)
- Interpreting collected data and offering justification for results.

Science and PSHE

- Discussing global citizenship and the impact of humanity on the world
- Environmental issues such as recycling and carbon footprint.
- Opportunities for debates and discussion linked to matters that arise and promote positive citizenship.
- Links to the 'Jigsaw' scheme specifically through the unit 'Changing Me' where sex and relationship are discussed at the appropriate level.

Science and Spiritual, Moral, Social and Cultural (SMSC) development

- Opportunities to examine some of the fundamental questions in life e.g. evolution of living things and how the world began.
- Opportunities for children develop a sense of awe and wonder regarding the nature of our world.
- Recognition of the social and moral questions that occur in our world linked to Science and taking part in discussions, for example, the effects of smoking and the moral questions involved in these issues

Assessment



At the end of each unit of work, teachers make a judgement on the child's subject knowledge and their ability to 'work scientifically'. This is done using the Herts for Learning assessment tool for Science. Teachers annotate and highlight assessment criteria as children demonstrate evidence of achieving it. Evidence for a judgment will be made from a variety of sources to include AfL during lessons and from investigative tasks.

During each unit of work children should be doing a range of investigations which include skills building linked to the working scientifically skills and also which cover each of the 5 types of enquiry: observing over time; pattern seeking; identifying, classifying and grouping; comparative and fair testing (controlled investigations); researching using secondary sources. Evidence should be collected of the children's skills building through written work in Science books, photographs and pupil voice.

Assessments for subject knowledge of each unit are recorded in the assessment tables at the end of the MTPs and should be placed in the termly planning folder and on the shared drive.

Assessments for Working Scientifically skills should be tracked using the HfL 'Working Scientifically Wheels', which are stuck in the beginning of Science books.

Teachers mark to assess whether children have achieved each lesson objective. In addition to this, WALT (We Are Learning To) stickers are used in each lesson, offering both the teacher and pupil to assess whether the objectives had been met. One of these objectives should be a Working Scientifically skill, indicated by WS. Teachers then mark each piece of work to show whether each step to success has been achieved. This is an opportunity for any misconceptions to be addressed. These should also be followed up in future lesson. Any next steps given should be addressed during their 'response time' where they are encouraged to respond to their teacher's comments and/or complete a task using a 'purple polishing pen'.

Assessment for Learning – Self and Peer Assessment

All children from Nursery to Year 6 are asked to make judgements about how they can improve their own work, through a range of self-assessment techniques (e.g. traffic light colours, thumbs up – thumbs down). Children are also given the opportunity to take part in peer-to-peer assessment where they support their peers in looking at how to improve their work. At the end of every lesson, each child uses traffic light colours and/or tick boxes on WALT stickers to show their understanding of the learning objective. In response to this, after the teacher has marked each child's work, they also traffic light the work (KS1), or tick WALT stickers (KS2) to show how much the child has understood. Discrepancies between child and teacher assessments are then addressed if necessary.

Resources

The Science resources cupboard is kept well-stocked with clearly-labelled resources needed to teach all of the units from Years 1-6. Specific resources for Reception and Nursery are kept within their classrooms. In addition to this, both the classrooms and the library have a good range of Science topic books. The Science subject leader also holds a number of books for use by class teachers, including books linked to concept cartoons and using



stories in Science. The Science subject leader replenishes resources where necessary, including offering advice when sourcing resources for 'wow' lessons such as dissecting owl pellets, investigating real fish or heart dissection.

Risk Assessment

Due to the nature of Science teaching, some lessons will need to be risk assessed prior to the lesson taking place. The school is a member of the CLEAPSS (CLEAPSS exists to support practical activities in science, D&T and art), who offer a range of risk assessments and advice linked to use of specific resources. Advice should be sought from the Science Leader before undertaking any lessons where it is felt there may be a potential risk, e.g. heart dissection, so that correct procedures can be followed and a risk assessment written if necessary. Reference may be made to the 'Be safe' ASE publication which offers a range of advice linked to possible resources that may be used. See Risk assessment policy.

Monitoring and Review

It is the responsibility of the subject leader to monitor the standard of children's work and the quality of teaching in science. 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.

Monitoring allows the subject leader to assess the quality of planning, teaching and learning to ensure progress is being made, coverage is assured and standards are being met.

Planning - The Science subject leader monitors planning on a termly basis and gives feedback to class teachers and the SLT as necessary.

Work scrutiny - Samples of children's work are monitored regularly by the Science subject leader and feedback to class teachers is given as appropriate.

Pupil Voice - The Science subject leader will regularly talk to groups of children from each year group on a termly basis about their views on their Science learning, Feedback is shared with class teachers as appropriate.

Observations & Teaching and Learning Walks - The Science subject leader will be given time to observe colleagues in their teaching of Science during each academic year.

Moderation – The subject leader will be given time to work alongside key stages (EYFS, KS1, LKS2, UKS2) to moderate work across the year showing evidence of linked to the Working Scientifically skills to support this assessment.

Science Capital

As a school, we are fully aware that the Science education our pupils receive during their primary years can help shape their attitude to Science for the rest of their lives. We therefore we have a duty to expose our pupils to as much information and as many experiences as possible in order to give pupils a positive attitude to science for their futures.



In order to support this, children are offered a range of wider opportunities both within school and through trips and activities outside the school. This includes an extra-curricular after school Science Club.

Linked policies

Health and Safety

Assessment and Recording

Special Needs

Equal opportunities

Teaching and Learning