



Glenthorne Community Primary School

Science Policy



Contents

1. *The National Curriculum*
2. *The Implementation of Science at Glenthorne*
3. *Assessment in Science at Glenthorne*
4. *Science Coverage at Glenthorne*
5. *Opportunities for Investigations*
6. *Health and Safety in Science*

Further Documents

- *Whole School Science Skills Overview*
- *Whole School Science Investigations Overview*
- *Science Assessment Sheets*

The National Curriculum

Purpose of study

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.

Aims

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.

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 block of knowledge and concepts in order to progress to the next stage. Insecure, superficial understanding will not allow genuine progression: pupils may struggle at key points of transition (such as between primary and secondary school), build up serious misconceptions, and/or have significant difficulties in understanding higher-order content.

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 social and economic implications of science are important but, generally, they are taught most appropriately within the wider school curriculum: teachers will wish to use different contexts to maximise their pupils' engagement with and motivation to study science.

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. The notes and guidance give examples of how 'working scientifically' might be embedded within the content of biology, chemistry and physics, focusing 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 should include: observing over time; pattern seeking; identifying, classifying and grouping; comparative and fair testing (controlled investigations); and researching using secondary sources. Pupils should seek answers to questions through collecting, analysing and presenting data. 'Working scientifically' will be developed further at key stages 3 and 4, once pupils have built up sufficient understanding of science to engage meaningfully in more sophisticated discussion of experimental design and control.

Spoken language

The national curriculum for science reflects the importance of spoken language in pupils' development across the whole curriculum – cognitively, socially and linguistically. The quality and variety of language that pupils hear and speak are key factors in developing their scientific vocabulary and articulating scientific concepts clearly and precisely. They must be assisted in making their thinking clear, both to themselves and others, and teachers should ensure that pupils build secure foundations by using discussion to probe and remedy their misconceptions.

School curriculum

The programmes of study for science are set out year-by-year for key stages 1 and 2. Schools are, however, only required to teach the relevant programme of study by the end of the key stage. Within each key stage, schools therefore have the flexibility to introduce content earlier or later than set out in the programme of study. In addition, schools can introduce key stage content during an earlier key stage if appropriate. All schools are also required to set out their school curriculum for science on a year-by-year basis and make this information available online. 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.

The Implementation of Science at Glenthorne

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:

- Science is taught in planned and arranged topic blocks by the class teacher; either as 'Science Days' every half term (Years 2-6) or every afternoon in a week each half term (Year 1). This is a strategy to enable the achievement of a greater depth of knowledge as children have the opportunity to develop their investigations, questioning and evaluating skills during the sessions.
- Through our planning, we involve investigation 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 address misconceptions that may either be pre-existing or become apparent during the sessions.
- 'What I Already Know' sheets are completed before each topic and 'What I Now Know' sheets are completed after all teaching is completed in order to gauge progress over each topic. Children also complete an assessment at the end of each topic to apply their new knowledge. At the beginning of each topic, children will complete a short quiz on any previous knowledge that they should have about that topic as a revision task (for example, in Year 6 children will be quizzed on knowledge they will have gained from all previous years - any misconceptions/lack of knowledge can then be covered throughout their topic if necessary).

- 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 and using scientific equipment as well as collating and interpreting results - they become increasingly confident in their growing ability to make 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.

Taking this approach at Glenthorne has resulted in fun, engaging and high-quality science teaching and learning that provides children with the foundations and knowledge for understanding the world around them. Feedback from both staff and children has been positive since lessons began being taught in dedicated days/blocks in each half term, rather than once-a-week hour-long lessons. Children are able to develop their skills of 'Working Scientifically' as they move through topics and year groups, due to the opportunities they are given to investigate their own ideas. Children's knowledge of scientific vocabulary is increasing and they are using it more readily when carrying out investigations and concluding their findings. Vocabulary for topics taught is displayed in each classroom to aid learning. Staff have been given training on how to ask high-level questions and are supported in their planning and delivery of science by experienced teachers where required.

Assessment in Science at Glenthorne

- Children's progress is continually monitored throughout Science sessions 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. Children are guided towards achievement of the main objective through the use of process based assessment, provided by and explained by the teacher. Assessment grids for each key stage (KS1, LKS2 and UKS2) have been produced in line with the national curriculum statutory statements for each topic. Children are assessed against these statements through observation, questioning and formal assessments whilst they are engaged in their learning. These grids include statements from the 'Working Scientifically' section of the curriculum; these skills are not taught discretely but instead incorporated into their learning in each topic whenever there is an opportunity to do so.

Science coverage at Glenthorne

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 1	Animals Including Humans - Ourselves	Animals Including Humans - Our Pets	Everyday Materials - Lets Build!	Everyday Materials - Marvellous Materials	Seasonal Changes - Wonderful Weather	Plants - What's Growing in our Gardens?
Year 2	Animals Including Humans - Healthy Animals	Living Things and Their Habitats - Habitats	Everyday Materials - Matter	Everyday Materials - Squash, Bend, Twist, Stretch	Living Things and Their Habitats - Gardens and Allotments	Plants = Ready, Steady, Grow!
Year 3	Animals Including Humans - Keeping Healthy	Light - Light and Shadows	Rocks - Rocks and Fossils	Forces and Magnets - Amazing Magnets!	Plants - Roots and Shoots	Plants - Artful Flowers, Fruits and Seeds
Year 4	Electricity - It's Electric	States of Matter - States of Matter Scientists	Sound - Listen Up!	Living Things and Their Habitats - Name that Living Thing	Animals Including Humans - Excuse Me, are these Your Teeth?	Living Things and Their Habitat - Help Our Habitats
Year 5	Earth and Space - Space Presenters	Forces - May the Force be with You	Properties of Materials - Music Festival Materials	Changing Materials - Changing Materials Education Pack	Living Things and Their Habitats - The Art of Living	Animals Including Humans - Life Explorers
Year 6	Light - Crime Lab Investigation	Electricity - Electric Celebrations	Living Things and Their Habitats - Classifications Connoisseurs	Evolution and Inheritance - The Game of Survival	Animals Including Humans - The Art of Being Human	Second Look Science - The Science of Sport

EYFS staff at Glenthorne deliver science content through the 'Understanding of the World' strand of the EYFS curriculum. This involves guiding children to make sense of their physical world and their community through opportunities to explore, observe and find out about people, places, technology and the environment. Some aspects of Expressive Arts Design are also science based. They are assessed according to the Development Matters attainment targets.

Opportunities for Investigations

The statutory 'Working Scientifically' strand of the curriculum is mostly achieved through giving our children the opportunity to work practically and investigate a range of hypotheses. Within the majority of topics, children are able to exercise and improve upon these skills. Investigations carried out across each year group in KS1 and KS2 can be found on the 'Whole School Science Investigations Overview'.

Health and Safety in Science

Please refer to the *Glenthorne Community Primary School Health & Safety Policy* for further guidance.