…we really care and make learning fun.

Stottesdon C. of E. Primary School

The Shropshire Gateway Educational Trust

Ofsted Outstanding 2011|2012

Science Policy

All references in this policy are saved here. This policy needs to be read alongside other school policies, including: Safeguarding Policy; E-Safety Policy; Marking and Feedback Policy; Monitoring and Evaluation Policy; Assessment Policy; SEND Policy; Equal Opportunities Policy; Teaching and Learning

Our rationale for teaching science:

A high-quality science education provides the foundations for understanding the world through the disciplines of biology, chemistry and physics. Science is a body of knowledge built up through the experimental testing of ideas. It is also methodical: a practical way of finding reliable answers to questions we may ask about the world around us. Science, in our school, is about developing children's knowledge and ways of working, which enables them to make sense of the world in which they live through investigation, as well as using and applying processing skills. Children are encouraged to understand how science can be used to explain what is occurring, predict how things will behave and analyse causes.

We believe that a broad and balanced science education is the entitlement of all children, regardless of ethnic origin, gender, class, aptitude or disability (For more information read the policies mentioned above).

Aims:

- Preparing our children for life in an increasingly scientific and technological world, by equipping them with the scientific knowledge needed to understand the uses and implications of science, today and for the future.
- Fostering concern about, and active care for, our environment.
- Developing children's understanding of the nature, processes and methods of science through different types of scientific enquiries that help them to answer scientific questions about the world around them.
- Helping develop and extend our children's scientific knowledge and conceptual understanding of the world around them through the disciplines of biology, chemistry and physics.
- Developing our children's understanding of the international and collaborative nature of science.
- Supporting children's application of mathematical, English and computing skills (in line with age related expectations of their year group) in collecting, presenting and analysing information.
- Children to develop cultural capital in relation to science e.g. knowledge of significant scientists; a breadth of knowledge for everyday aspects of science (animals, plants, materials, climate change); an ability to have key skills related to science (temperature, timing), which can be transferred between disciplines.

Scientific learning attitudes:

- Encouraging the development of positive attitudes to science.
- Building on our children's natural curiosity and developing a scientific approach to problems.
- Encouraging open-mindedness, self-assessment, perseverance and responsibility.
- Building our children's self-confidence to enable them to work independently.
- Developing our children's social skills to work co-operatively with others.

- Providing our children with an enjoyable experience of science, so that they will develop a deep and lasting interest and may be motivated to study science further.

Scientific skills:

- Developing children's abilities to seek answers to questions through collecting, analysing and presenting data.
- Developing the skills of investigation ('working scientifically') - including observations over time, pattern seeking, identifying, classifying and grouping, comparative and fair testing (controlled investigations) and researching using secondary sources.
- Enabling our children to use scientific equipment independently in investigations.
- Developing the use of scientific language, recording and techniques; including measuring, predicting, hypothesising, experimenting, communicating, interpreting, explaining and evaluating.
- Enabling our children to become effective communicators of scientific ideas, facts and data.

How science is structured through the school:

Science is a core subject in the National Curriculum *(2014) and the Statutory Framework for the Early Years Foundation Stage (2021).* Children in the Foundation Stage are taught the science elements through the Early-Learning Curriculum strand, Understanding of the World, in order to reach the Early Learning Goal.

The school follows the National Curriculum Science (*2014*). The Science topics are taught as set out in each class' curriculum map and include suggested activities to develop children's ability to work scientifically. Units have been placed at times each year where pupils will be able to best learn these topics (seasonal changes throughout the year, plants in spring and summer). Due to mixed year groups, the science curriculum is taught on a 2-year programme, which ensures progression between year groups and aims to revisit topics. 'Working scientifically' skills should be taught through the teaching of the science content. Children should be explicitly taught the appropriate knowledge and skills to use scientific equipment, before they apply their knowledge and skills to an enquiry. Children should engage in at least two full enquiries each term, taking increasing responsibility for their planning, predictions, testing and recording/interpreting of the results (age appropriate). Where possible, topics should be taught in collaboration with outside agencies or where real-life application can be seen. STEM workshops with Lacon are planned in line with objectives covered that term. Where possible, the children should be applying their mathematical skills when working scientifically (e.g. reading scales, measuring, statistics, averages).
All teachers should be teaching science for an average duration of 2 hours each week (this may be combined with other subjects as appropriate). Lessons should be taught in a carefully planned sequence using a small step approach, which will allow pupils to build on prior learning and make connections because the workload does not overload their working memory. Retrieval practice will be used in lessons to help children to strengthen memory links to their long-term memory and teachers will make knowledge they need to know clear. Explicit connections should be made between units to help children understand that different scientific disciplines are connected. In upper KS2, children are introduced to whether their units are linked to biology, chemistry or physics to prepare them for secondary school.

Assessment and recording in science:

We use assessment to inform and develop our teaching.

- Topics commonly begin with an assessment for learning activities to develop an understanding of what children already know.
- End of unit assessments may be used in older year groups to assess what they have learnt.
- We assess for learning (AfL) and retrieval practice throughout the lessons and term. Children are involved in the process of self-improvement, recognising their achievements and acknowledging where they could improve.

- Quizzes and activities are used throughout units to get children to recall information from their long-term memory to improve retention. Key knowledge they need to know if made explicit to pupils.
- We give feedback on each piece of work making it clear verbally, or written, where the work is good, and how it could be further improved. Learning objectives should be highlighted to show achievement (green/pink). Peer marking for success criteria is also used when appropriate.
- We have individual progression grids (Please see our assessment skills progression for science) that record children's progress in knowledge and their ability to work scientifically. These are recorded on a spreadsheet, which is regularly updated at the end of each unit.
    - Progression grids can be found on the school network: Staff Workgroup/ All Staff/ Assessment/ Science
    - On the spreadsheet, numbers are used to detail the progress children are making with that skill (1=emerging, 2=developing, 3=secure, 4 = above).
    - The spreadsheets are maintained by teachers, can be accessed by other teachers for transition and are reviewed by the subject lead and headteacher.
    - In years 1/2, 3/4 and 5/6, the working scientifically aspect is built up over a two-year program.
- Each term, teachers assess children's attainment in the unit covered, using the progression grids. The school monitors these in order to inform strengths and development areas.
- Equally important is the continuous assessment of children's work, much of which is informal. This assessment is used to inform teaching throughout the school and is in line with our marking policy.
- Reports to parents are made verbally twice a year, and written twice a year, describing each child's attitude to science, his/her progress in being able to work scientifically and his/her understanding of the content of science curriculum.

School monitoring and evaluation:

Please see school Monitoring and Evaluation Policy.

- Annual data for science is recorded on Otrack. This is analysed and reported on by the subject leader. Outcomes and patterns inform the school development plan. Children who are not at age related expectations are identified and supported.
- The school monitors progress through the school by sampling children's work at regular intervals, observing lessons, talking to children and learning walks or audits on particular areas.
- The link STEM governor will be invited to visit and be involved in monitoring and evaluation activities. The subject lead will report to governors through the school development plan and attendance at meetings where appropriate.

Resources:

- The central science store is in the library, where the resources are clearly labelled. All teachers are responsible for keeping the equipment tidy and should check stocks of equipment before they begin teaching a unit. Some electronic equipment is stored in Clun (data loggers and weather measuring equipment).
- Science non-fiction books are stored in topic boxes for each term.
- Resources are saved centrally, including: the progression of skills, key misconceptions and teaching guidance are available to support teachers across all phases of the school. These resources include TAPS, PLAN and Change the Story.

- Head Start books provide age-appropriate assessment activities to assess the retention of prior learning.
- Retrieval practice resources are centrally stored.
- Quality online resources are shared to enrich the curriculum: concept cartoons and https://explorify.wellcome.ac.uk/
- Liaison with schools across the trust can support access to science resources.
- Reach Out CPD can be used by teachers to complete free units to develop subject knowledge: https://www.reachoutcpd.com/
- www.cleapss.org.uk is used for guidance on provision and Health and Safety.
- Quality resources are cascaded through staff meetings and are saved centrally.

Review

This science policy will be reviewed by the science curriculum leader or the senior management team.

Date of review February 2023 Next Review February 2026