Science Curriculum at Gaddesden Row School

Intent

At Gaddesden Row School, we recognise science as a vital subject for understanding and shaping the world around us. Our science curriculum aims to inspire curiosity, deepen knowledge and equip pupils with the skills to think and work scientifically. We want every child to see themselves as a scientist — curious, critical, and capable of asking questions and seeking evidence-based answers.

Our curriculum provides a carefully sequenced journey through the key disciplines of biology, chemistry and physics. It enables pupils to develop both substantive knowledge — the key facts and concepts that explain how the world works — and disciplinary knowledge — the skills of scientific enquiry, reasoning and investigation. Learning is structured so that prior knowledge is revisited and built upon in small, manageable steps, ensuring pupils secure understanding before moving on.

We aim for children to:

- develop secure knowledge and conceptual understanding through a coherent, sequenced curriculum;
- understand and apply the processes and methods of science through a range of enquiry types;
- communicate scientific ideas confidently using accurate vocabulary and structured reasoning;
- recognise the relevance of science to their own lives and the wider world, including sustainability and environmental responsibility;
- experience a sense of excitement and curiosity through meaningful and purposeful scientific exploration.

Themes of sustainability and care for the natural world are woven throughout our science curriculum, helping pupils understand how science contributes to protecting and improving our planet. Our ambition is for every pupil, regardless of background or ability, to develop the confidence, curiosity and critical thinking skills needed to become lifelong learners and scientifically literate citizens.

Implementation

Science is taught weekly across Key Stages 1 and 2, following the White Rose Science Scheme of Learning, which provides a clear progression of knowledge, enquiry skills and vocabulary

from Early Years to Year 6. In the Early Years and Year 1, children explore the world through play and first-hand experiences that nurture observation, questioning and curiosity.

Because our school is small and classes are mixed-age, the science curriculum is delivered through a two- or three-year rolling programme. This structure ensures full coverage of the National Curriculum while maintaining a logical progression of knowledge and skills. Where units are revisited within a cycle, planning is adapted to ensure suitable progression for all pupils, avoiding unnecessary repetition and building challenge through increased complexity, depth of understanding and refinement of working scientifically skills.

Each unit is designed to build on what has been taught before, with regular opportunities for consolidation and recall. Knowledge is revisited through deliberate retrieval opportunities, spaced practice and the revisiting of key concepts in different contexts, helping pupils embed and retain scientific understanding in their long-term memory. Practical work is purposeful and directly linked to curriculum knowledge, so that pupils understand both *what* they are doing and *why* they are doing it. Teachers plan for a balance of enquiry types, including observation over time, pattern seeking, classifying and identifying, research, and comparative testing.

Key features of implementation include:

- Sequenced units that ensure security of knowledge before progression.
- Explicit modelling of the eight key “working scientifically” skills, developed cumulatively through the school.
- Progression in working scientifically skills tracked through WALT sheets, which appear in pupils’ books before each unit of work.
- High-quality practical experiences using appropriate equipment, including outdoor learning and fieldwork within our rural setting.
- Systematic development of scientific vocabulary using the school’s Science Vocabulary Progression document.
- Adaptive teaching and scaffolding to support pupils with SEND and those from disadvantaged backgrounds, while providing deeper reasoning and open-ended enquiry for higher-attaining pupils.
- Regular retrieval practice, low-stakes quizzes and discussion to strengthen long-term recall.
- Diagnostic assessment and live feedback to identify misconceptions early and inform responsive teaching.
- Enrichment through STEM activities, Science Week, workshops and visits from experts that link learning to real-world science.

Assessment outcomes are analysed to identify trends in understanding across cohorts, which informs curriculum adjustments and ensures that knowledge and enquiry skills build progressively year on year.

The subject leader monitors planning, teaching and pupil outcomes through lesson visits, pupil voice and work scrutiny, ensuring consistency, progression and ambition. Insights from this monitoring are used to inform staff development and the ongoing refinement of teaching practice.

Impact

Our science curriculum results in enthusiastic, knowledgeable and confident learners who understand that science is both a body of knowledge and a way of thinking.

As a result of our approach, pupils:

- retain key scientific knowledge and can apply it in new and varied contexts;
- use scientific vocabulary accurately and fluently to explain their understanding;
- demonstrate curiosity, independence and resilience when planning and carrying out investigations;
- understand how evidence supports scientific explanations and conclusions;
- appreciate how science impacts their lives and the wider world, including issues of sustainability and innovation.

Pupils' understanding is secure, connected and long-lasting. They can recall prior learning and apply it to new enquiries, reflecting the coherent sequencing of our curriculum and the deliberate revisiting of key ideas.

By the time they leave Gaddesden Row, pupils have developed the knowledge, skills and attitudes to approach science with confidence and curiosity.