

Curriculum Area Intent

Science



1.1 Rationale

Have you ever wondered why the sky is blue? If there are more than 118 elements? Whether there are more undiscovered species of plant or animal? The curiosity that lies behind these questions and the drive to find the answers is what makes us human and it lies in the heart of Science. Answering questions is essentially the whole purpose of science and answering these questions simply brings more questions to the surface. Great scientists, those at the very frontier of what we understand as science knowledge, would still declare that the more we understand about the universe, the more there is to find out. Through the specific disciplines of biology, chemistry and physics, a high-quality Science education aims to develop students as critical thinkers and to look at explaining the world in which we live in. 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 and predict how things will behave around them. Studying Science ensures our students are prepared for the wider world, teaching them valuable skills such as; problem solving, mathematical reasoning, data analysis, communication, evaluation, planning and safety.

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

The rationale for Sequencing (Scope and Rigour)

Students are introduced to the key scientific principles, and these are developed year on year in a spiral format as students revisit and build upon prior knowledge. This builds understanding across our 5-year curriculum leading to GCSE qualifications in either Combined Science or separate Biology, Chemistry and Physics subjects.

Research informing the Sequencing decisions.

Both Rosenshine's Principles of Instruction and Cognitive Load Theory have informed our curriculum sequencing and implementation. Both recognise the importance of memory in building schemas required to develop mastery and retention. Our schemes of work are sequenced so that students revisit skills and build upon prior learning over time, chunking more complex concepts into smaller parts. By limiting the amount of new information students are exposed to at one time, we can check understanding before moving the learning on. A scaffolded approach, combined with

modelling and step by step success criteria means students are exposed to new skills and concepts gradually, building strong foundations and links across texts and skills.

Broader Themes:

Key Scientific Principles

- Scientific method and testing including development of practical skills
- Cells and Organisation
- The Environment
- Living Things
- The Building Blocks of Materials
- Chemical Reactions and Analysis
- Human Impact on the Environment
- Energy
- Electricity
- Forces
- Waves

