



Philosophy

Science has changed our lives and is vital to the world's future prosperity.

Biology is the science of living organisms (including animals, plants, fungi and microorganisms) and their interactions with each other and the environment. The study of biology involves collecting and interpreting information about the natural world to identify patterns and relate possible cause and effect. Biology is used to help us improve our own lives and to understand the world around us.

Chemistry is the science of the composition, structure, properties and reactions of matter, understood in terms of atoms, atomic particles and the way they are arranged and link together. It is concerned with the synthesis, formulation, analysis and characteristic properties of substances and materials of all kinds.

Physics is about understanding the world around us from the tiniest particle imaginable to the staggering enormity of the Universe. Physics uses the latest and the most advanced technology to probe the mysteries of the sub-atomic, quantum world and the most distant detectable astronomical phenomena. Physics uses mathematics and models as well as practical experimentation to study the behaviour of matter, energy, waves, forces and fields.

Psychology is the scientific study of mind and behaviour: why do people do, think and feel as they do? The study of psychology involves designing experiments to test our common sense assumptions about how people work, to determine to what extent these are accurate. Psychology does not have a single paradigm: psychologists work from different approaches to define and explore how human beings operate.

Intent

All pupils are taught essential aspects of the knowledge, methods, processes and uses of science. Through building up a body of key foundational knowledge and concepts, pupils are encouraged to recognise the power of rational explanation and develop a sense of excitement and curiosity about natural phenomena. They are encouraged to understand how science can be used to explain what is occurring, predict how things will behave, and analyse causes.

Science is a motivating and inspiring journey of investigation and discovery, which we make as 'hands on', fun and relevant as possible. We believe the skills learnt in science are key to enabling our students to understand, analyse and evaluate the complex world around them.

Design

Our curriculum is designed to embed and develop the Big Ideas of each subject:

Biology Big Ideas:

- Cells & Cellular Processes - The structure and functioning of cells is vital to understanding how living organisms survive. The cellular processes within living organisms form fundamental descriptions of how these organisms survive.
- Biological systems for life - Biological systems provide with the vital knowledge to look at the organism as a whole and be able to understand how one functions to ensure survival on a daily basis as well as for the species.
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- Organisms and their interactions with the environment - Organisms do not live in isolation. All are linked and interdependent on others whether it is producers or their own predators. To understand these interactions enables us to think about our own impact on the world we live in.

Chemistry Big Ideas:

- Materials and their properties - Different things surround us, it is vital that we understand where they have come from and what we can do with them. Understanding elements and their properties enables us to understand how things work as well as using that knowledge to make substances that can be used in the future.
- Chemical changes - Chemicals provide us with so many reactions and resources that to understand those means we can understand our own impact on the Earth as well as how to ensure we preserve it for the future.
- Our Earth and its atmosphere - "We do not inherit the Earth from our ancestors, we borrow it from our children" and this section helps us to understand how true this is and how Chemistry can help us ensure this is the case.

Physics Big Ideas:

- Energy - Energy can be transferred and stored, but never created or destroyed. Nothing can happen without a transfer of energy. By better understanding how energy works we can better understand our lives. Energy usage issues are at the heart of many issues in industry, finance, politics and the environment
- Forces and fields - Sports, transportation and space exploration are all dependent on our understanding and application of our knowledge of forces and the fields that can be used to make them
- Matter and materials - Our study of matter helps us select, design and utilise materials for all aspects of our lives. Materials can be used to improve our lives by making our vehicles safer and our homes secure, among many other applications

Psychology Big Ideas:

- Free will or determinism? Are we controlled by internal or external forces, or do we have control over our actions?
- Nature or nurture? To what extent are we formed by our genes, or our environment?
- Idiographic or nomothetic? Should we look at what people have in common, or should we study what makes each individual unique?
- Holism or reductionism? Should we look at the whole person, or focus on smaller parts (such as neurotransmitters or stimulus-response units)?
- Science or non-science? Can scientific methods truly capture what a human being is? Some psychologists reject scientific method and find alternative ways of exploring how people think and behave.

Delivery

The delivery of our subject reflects the high expectations we have for our students and incorporates the QE values. Lessons all begin with retrieval tasks from all 3 subjects and their previous content, to ensure students keep linking all their knowledge and ideas. Teacher explanations of concepts follow, using demonstrations or through student practical work when appropriate to enhance the learning. Students have opportunities to apply their knowledge and extend their understanding through questioning, discussion and further tasks. Assessments are in the forms of baseline quizzes at the start of topics, continuous questioning, class tasks and end of cycle assessments as well as more formal yearly exams.