

The Science curriculum at Five Acres High School

In Science, we learn about the ideas and concepts that make the world around us work so that we can solve practical problems and make informed choices.

Intent

Why should all pupils learn this subject?

Science is a dynamic subject that helps you to make sense of the world around you. You learn powerful knowledge about how biological, chemical and physical processes shape the planet we live on. Scientists try to answer questions facing the world, such as preventing and treating disease, managing climate change, and how we can develop and use resources sustainably. The study of Science helps to create thoughtful, active citizens with an informed understanding of global scientific issues. In addition to learning powerful knowledge that helps students understand the world around them, students develop transferable skills that will support them in any future path of work or study. Students learn these skills through Science practicals, which are a fundamental part of a Science curriculum. Practical enable students to put their knowledge into practice whilst they learn about the Scientific Method by collecting, presenting and analysing the results of experiments. Students develop a range of numerical skills, such as analysing numerical data, statistical information and interpreting a range of graphs that supplement their Scientific understanding.

What is the core knowledge in this subject?

Core knowledge in Science can be broken down into the following components.

Substantive concepts: The essential knowledge pupils are taught in Science. Examples from our curriculum include:

Biology topics such as Cells, Organ Systems in the body, Health and Disease, and Ecology

Chemistry topics such as Atoms, Elements and Compounds, the Periodic Table, Chemical Reactions, Chemical Bonding and Materials

Physics topics such as Energy, Particle Theory, Waves, and Forces

Disciplinary concepts: The disciplinary practices used by scientists to create new scientific knowledge through experimentation and observation.

Implementation

How is this subject taught at FAHS?

Our curriculum is based around 17 **'big ideas'** in Science that form the substantive knowledge of Science. Six Big Ideas are based around Biology, four big ideas are based around chemistry, and six around physics. These Big Ideas are broken down into smaller topics that build on each other and are interrelated. The curriculum is designed so that students encounter each Big Idea regularly in a way that enables them to build their knowledge and understanding over time, and draw links between the topics in each Big Idea, but also between the Big Ideas of Science. Underpinning everything is the Big Idea based on the scientific process, which introduces students to the disciplinary knowledge of Science. This is taught continually throughout the curriculum, and links to the 'working scientifically' section of the AQA GCSE specification.

What are the key ways students practise in this subject?

Describe and explain scientific processes and ideas using key terms

Use scientific models to explain concepts

Conduct scientific experiments to demonstrate understanding of Science concepts

Collect, present and interpret the results of experiments during practical work to draw conclusions supported by evidence

Use maths skills to process data and draw links between observations and scientific concepts

Impact

What does assessment look like in this subject?

Students take assessments in Science every term. Assessments are based on the topics taught over the preceding term and will involve a mixture of short and long answer questions, as well as maths and graph skills.

In the Summer term of Year 10 students take a full set of GCSE Paper 1 exams during their PPEs, followed by the Autumn PPEs, which are a different set of Paper 1 exams. The final set of PPEs in March of Year 11 is the Paper 2 exams, to give students the best idea possible of their potential in Science before they take their GCSE exams in the Summer of Year 11.

We offer students both Separate Science and Combined Science at GCSE. Students who take Separate Science will achieve three Science GCSEs, one in Biology, one in Chemistry and one in Physics. Students who take Combined Science will achieve two Science GCSEs. In both cases, students will learn about all three Science and will take six Science papers, two in each Science.