



Curriculum Overview

Year 11 – Science 2021-2022

Rationale for Year 11 Science

A high-quality Science education provides the foundations for understanding the world through the specific disciplines of Biology, Chemistry and Physics. Science always changes our lives and is vital to the world's future prosperity. All students will be taught essential aspects of the knowledge, methods, processes and uses of Science. Through building up a body of key foundational knowledge and concepts, students will be encouraged to recognise the power of rational explanation and develop a sense of excitement and curiosity about natural phenomena. They will be encouraged to understand how Science can be used to explain what is occurring, predict how things will behave, and analyse causes.

What will students learn and why?

Year 11 sees the culmination of the GCSE journey for students at St Joseph's Catholic College. As the GCSE Combined Science and Separate Science courses are knowledge and skills rich, teaching of new content takes place until Easter. Students build on the units studied in Years 9 and 10 and the focus will be on applying this understanding to a range of different contexts. The units covered in Year 11 include: B6 Inheritance, variation and evolution; B7 Ecology; C6 Rates of Reaction, C8 Chemical analysis, C9 Chemistry of the atmosphere; C10 Using resources; P5 Forces; P6 Waves; P7 Magnetism and electromagnetism and for the separate scientists, P8 Space. The AQA GCSE Science courses are linear, with clear progression in complexity and demand. Students will find many references to units studied in previous years.

How will students learn?

The Science scheme of learning encourages the development of knowledge and understanding of Science through opportunities for working scientifically. Students have used throughout their time at St Joseph's, a variety of models such as representational, spatial, descriptive and mathematical to solve problems, make predictions and to develop scientific explanations and understanding of familiar and unfamiliar facts and scenarios. It is an exciting year for students as they will have copious opportunities to practise these skills, without scaffolds, developing an appreciation of the power and limitations of Science. Students are always encouraged to form their own considered opinions regarding ethical dilemmas in everyday life, such as the use of genetic engineering and cloning technology. There is a focus on the evaluation of evidence provided to students, including the source of the evidence and the possibility of bias. This helps students to become critical thinkers who are able to analyse data objectively. Due to the content included in GCSE Science, it is imperative that students recap and recall their knowledge regularly. Students will be given many opportunities for retrieving information using retrieval tasks and spaced practice in lessons, and at least one homework per week will be based on recalling previous units. The design of the pathway through the Year 11 curriculum means that there is plenty of interleaving between topics and opportunities for recall. Students are expected to be familiar with a number of core practical's (Required Practical's) and these build on the skills developed throughout their time at St. Joseph's. The sequence of units taught mean that the curriculum is interleaved and along with regular recall, explicit links between the three disciplines can be made.

Cross-curricular links with other subjects are also made explicit, as well as a general thread of literacy and numeracy skills weaving through the curriculum. The final Biology unit, for example, has very strong links to GCSE Geography.

Students will receive regular feedback in different forms and are expected to respond to this feedback. Time will be available for them to do this.

Importantly, students are introduced to several careers in the Science industry as they journey through the units, ensuring they realise that Science underpins much of their future.

How will students be assessed?

Students will be assessed in their lessons regularly to check for understanding. These assessments could take many forms, including regular retrieval quizzes, past exam paper questions and teacher questioning using techniques such as 'no hands up'. Alongside this, students will have a more formal assessment in term 1, for which they will receive feedback to prepare them for their Mock examinations. The Mock examinations will give students an experience of three of the six papers, Biology 1, Chemistry 1 and Physics 1. These will be teacher assessed against exam board criteria and students will have feedback based on their performance and the Examiner's report for that paper. Students will complete a Biology, Chemistry and Physics paper 2 during term 4. This paper will be completed under exam conditions so that students will receive useful feedback that they can apply to the summer exams.

What is the aim for learners by the end of the year in comparison to the previous year?

The aim for learners studying Year 11 Science is that they will continue to be enthusiastic about their Science learning, be able to hold confident debates and justify opinions on a wide range of scientific issues and have developed effective study habits, retrieving and practising their knowledge. They will be more confident in independently planning and carrying out practical work and in evaluating their work. Many of the units this year are synoptic in nature and students should now be able to apply their previous learning to unfamiliar situations and be aware of how topics link together. Students will learn how these topics relate to the world around them, building their cultural capital. For example, C9 (Atmosphere) encourages them to consider air pollution and their own impact on global warming, B7 (Ecology) looks at the importance of maintaining biodiversity and P5 (Forces) stresses the importance of understanding factors relating to safe driving. All topics include analysing data which develops their critical thinking skills in preparation for adult life. There will also be opportunities to look at a range of careers where scientific understanding and the transferable skills learnt in the laboratory will be invaluable. Whether students continue to study Science or not, they should leave St Joseph's Catholic College with a life-long curiosity about the world and beyond.