

Science Department Curriculum Policy

Introduction

As a science department we want to make sure that our students leave us with a high level of scientific literacy that will enable them to understand scientific news when it hits the headlines and make informed choices about their own and future generation's lives (vaccinations and GM food etc).

We choose to start the GCSE content part way through year 9 so that we cover in detail the new increased content that is now in the new GCSE specifications. This is also so that students meet the key content (periodic table, cell structure, forces etc) early on and then have the chance to constantly revisit this core knowledge whilst also improving their numeracy and literacy skills elsewhere in the school curriculum.

Knowledge in science

The core knowledge in science will be based on a 5 year scheme of work from the AQA exam board and the members of department input on other core knowledge that we believe is beyond the specification but important to the students understanding of the world around them and their place in it.

For science we have the three main strands of Chemistry, Physics and Biology. Within each of those are core pieces of knowledge that students need to access the rest of the course.

Biology – transport in cells – every topic throughout biology relies on students understanding of osmosis, active transport and diffusion to explain how every molecule moves through all living things, so this is one of our first topics we teach alongside cells to put the transport into an initial context.

Chemistry – The periodic table – Nearly all the chemistry topics rely on the students understanding and manipulation of the periodic table, understanding all the number and symbols and how much of the content relies on being able to find elements on the periodic table quickly. This is the start point of the chemistry course. Students are issued a periodic table like a knowledge organiser.

Physics – Forces, energy types and manipulation of equations. Although students may not have covered rearranging and manipulation of equations in maths as early on as we introduce them in science, as this is now a vital life and GCSE skill we feel it is important to teach it step by step as soon as possible. One of the first physics topics we cover is speed, distance and time using this as an opportunity to bring in those equations skills.

In science we have always revisited core topics as we go through the five years of a secondary curriculum as all chemistry topics rely on the understanding of atoms and the periodic table etc. However, we will be making sure these core pieces of knowledge are permanently revisited on a more regular basis through the retrieval quizzes at the start of lessons, not simply at the start of new topics.

This allows us to include the hinterland of examples that will allow our students to access the science of the 'real world' and also again those more difficult application questions at GCSE.

Examples of hinterland

-Vaccines and the MMR/Andrew Wakefield scandal

- Recycling and the issues surrounding plastics
- Electrical safety and relating it to student's homes
- Radioactivity in the context of Chernobyl and Fukushima
- Energy calculations to help them understand energy bills

We aim to print out any long passages so the students can track the text along with the teacher, helping them to again access that higher tier 3 science specific vocabulary. We are slowly introducing the reading of more and more scientific articles/journals. Starting with articles from the media – BBC news, the broadsheet newspapers, then increasing that reading to be able to access scientific journals and follow the key ideas.

Key stage 4

Since the increase in the maths element of all the science subjects in the recent GCSE reforms we are having to teach higher maths skills than we have ever had to in science. We work alongside the maths department who are going to use the physics equations in the maths lessons and take some of the maths based questions and show the science teachers and students how they would teach the students to approach the questions. The maths teachers are specialists so again we want our students to have the best resources to hand.