Curriculum Overview

Year 9 – Science 2020-2021

Rationale for Year 9 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.
The Science GCSE curriculum begins in year 9. Students build on the knowledge and skills they have developed at KS3 by delving deeper into the fundamental elements of Science. This gives teachers and students an opportunity to build in time for discussion, debate, application of concepts and further retrieval, enabling students to deepen and extend both their knowledge and understanding of Science.

What will students learn and why?

Students in all classes follow the same curriculum in year 9 and will have the option, decided along with their teachers, of whether to follow the Combined Science (Trilogy) pathway in years 10 and 11, or the Triple Science pathway. Students will follow the AQA syllabus. It is a linear course, with clear progression in complexity and demand. The key concepts in Biology, Chemistry and Physics are covered to support students through the transition from KS3 science, ensuring all have a solid grounding in the fundamentals necessary to make good progress through the GCSE courses. The GCSE curriculum builds in multiple opportunities for recapping and revisiting previous content. The Ebbinghaus forgetting curve is often referred to so that students see the benefits of regular retrieval. The units covered in year 9 are: B1 Cell biology; B2 Organisation; C1 Atomic structure and the periodic table; C2 Structure and Bonding; P1 Energy and P3 Particle model of matter. Whichever pathway students follow, the curriculum is challenging and will allow them to progress to further studies in Science.

How will students learn?

Due to the level of 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 fortnight will be based on recalling previous units. The design of the pathway through the Year 9 curriculum means that there is plenty of interleaving between topics and opportunities for recall. For example, the adaptations of the small intestine in the B2 topic relies on students understanding and being able to apply their knowledge of the diffusion and active transport from B1 taught earlier in the year. Students are expected to be familiar with a number of core practicals (Required Practicals) and this builds on the experimental skills developed at Key Stage 3.
The more conceptual elements of the Science Curriculum are taught using tangible models that students are more familiar with and can relate to. The aim is not to cause cognitive overload but to optimise learning whilst respecting students' working memory capacity. Key concepts are introduced, explained, summarised and revisited through the course.
Cross-curricular links with other subjects are made explicit, as well as a general thread of literacy and numeracy skills weaving through the curriculum. Students will receive regular feedback in different forms and will be expected to respond to this feedback. Time will be available for them to do this.

Importantly, students will also be 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 a range of different ways, using both summative and formative assessment. Regularly, in lessons, students will be assessed by the teacher to check for understanding. Retrieval practice is a key element of the course, with students completing low-stakes quizzes on material covered within a lesson, topic, or material covered previously. Students are also encouraged to self-quiz and quiz each other in order to build schema, helping them solve problems in the future. Teachers will provide plenty of exam question practice for students, both to assess content but also to develop students' exam technique and application of exam-specific terminology. AQA examiners reports are used in conjunction with these to highlight common errors and misconceptions.
Alongside this, students will have assessments that are more formal, averaging once a term, for which they will receive feedback and time to respond to that feedback. It has been the practice of the Science Department for some time to ensure the assessments do not just relate to the current or most recent topic studied but could include material on any topic covered up to the date of the assessment. This means that students are actively encouraged to revisit and revise content more often, again, building schema.

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

The aim for learners studying Year 9 Science is that they will: continue to be enthusiastic about their Science learning; be secure in the fundamental Science knowledge that underpins the rest of the curriculum and have developed effective study habits, retrieving and practicing their knowledge.