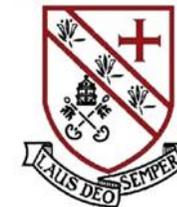


Curriculum Overview
Year 8 – Science 2021-2022



Rationale for Year 8 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?

Students will revisit, recap, revise and delve deeper into the material covered in Year 7. The students will start with a focus on Organisms, where the work from cells feeds into organ systems, respiration and health. Chemical Reactions and Materials builds on both Matter and the Periodic Table and again, provides opportunities for the inclusion of scientific numeracy, literacy and investigative skills. Electricity is conceptually challenging but will build on the structure of the atom. Most students have some experience of electricity and circuits from primary schools but also many have misconceptions that need unpicking. This will be revisited in the unit on Magnetism later in the year. Earth and Atmosphere takes the Solar system further, focusing on the intricacies of our own planet. With the necessary Global challenge on Climate, there are plenty of opportunities to inspire and engage our students to be critical social contributors. Forces 2 recaps motion from Forces 1, ensuring students can draw and interpret distance-time graphs. Students are challenged to go further and apply their work on forces to pressure and moments. Moments provides a great introduction to the skeleton, interleaving the disciplines within Science.

Students study inheritance next, again linking back to cells, specialised cells and DNA, studying the structure of DNA and starting to explain its structure and how it has evolved over time. Following this, students will build on the energy unit from Year 7 studying energy transfer in the form of Waves. The Year 8 specification focuses on sound and light as examples of waves. Metals and Acids builds on chemical reactions and Year 7 acids and alkalis. By now, students will be able to carry out investigative work more independently, drawing up comprehensive risk assessments and recording observations. Ecology links both Inheritance and Earth and Atmosphere.

How will students learn?

Given above is the rationale for the sequence of topics. Students will be given many opportunities for retrieving information using retrieval tasks and spaced practice in lessons, and at least one homework per topic will be based on a previous topic(s). The design of the pathway through the Year 7 & 8 curriculum means that there is plenty of interleaving between topics and opportunities for recall and examples are given above.

Given the practical nature of Science, students will use carefully chosen experiments to practise their investigative skills. One 'Key' practical or investigation has been chosen per topic, students will focus on three core skills within each investigation. There will be different skills practised in each key practical so that when students come to completing required practical's at Key Stage 4 they will have mastered the skills necessary to succeed. Working scientifically gets students working in similar

ways to scientists in the real world. Students are expected to analyse data by choosing methods with which to present it, draw conclusions and discuss limitations of the data. Scientific literacy has a big focus within lessons and students are supported with learning new terminology by looking at the etymology of the word. Cross-curricular links with other subjects are always made explicit, for example, graphing and calculation work linking to Maths, the Earth's structure and geology linking to Geography and the future of our planet and how to look after it linking with Citizenship.

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 different contexts. 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.

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

The aim for learners studying Year 8 Science is that they will continue to be enthusiastic about their Science learning and further develop important investigative skills ready for the demands of the Key Stage 4 GCSE curriculum, which begins in Year 9. Students build on the topics studied in Year 7 and are introduced to different models to explain phenomena. Evaluation skills develop as students discuss strengths and weaknesses of each model. Scientific literacy is still a priority but students in Year 8 are expected to use a range of tier 3 vocabulary consistently both in discussions in class and in written work. Students plan and carry out investigations, identifying the dependent, independent and control variables and writing out full risk assessments. They will explain patterns and trend from their results and gather evidence to confirm or reject their hypothesis. Within the Year 8 scheme of learning, there are opportunities to discuss how scientific and technological developments may be made in different economic contexts and a range of career opportunities are identified.

