

## SCIENCE INTENT

Science at SCA we build on our student's natural curiosity about the world around them in order to develop a stimulating and knowledge rich curriculum. We believe that studying Science allows students to ask big questions and discover not only how the world works but our place, impact, role and responsibilities within it. The curriculum has been designed to be hands on with regular opportunities for the development of scientific questions and practical skills. Pupils will be able to perform practical experiments safely and articulate the importance of following correct procedures as well as the ability to write clear and concise methods and interpret and analyse results.

The curriculum is sequenced to support the acquisition of knowledge cumulatively. For example: Y7 Cells gives students the basic understanding of cells, tissues and organs. Y8 Nutrition and Digestion builds on this in the context of the digestive system and introduces the concept of enzymes. At KS4 the action of enzymes is developed further to include specific examples and mechanisms. Prior learning is always made explicit in schemes of work and frequent, low stakes quizzing is used to improve knowledge retention and retrieval of these concepts. We understand that all students will come to Science lessons with a variety of preconceptions. Some of these will in fact be misconceptions that must be identified, addressed and replaced with more scientific ideas. Some misconceptions can take time to shift, so formative assessment is used to check that thinking has changed in the long-term.

Scientific skills in numeracy are developed systematically throughout the curriculum. Graph skills for example are first introduced in Year 7 and build upon prior learning from primary school. These skills are constantly revisited throughout the curriculum in order to allow students in later years to confidently and accurately produce and analyse graphical data independently. Topics in Physics requiring robust numeracy skills, such as energy and forces, are again introduced in Year 7 where students are taught to recognise key equations and standard units are made explicit. Repeated practice is given to increase familiarity with these. These topics are then reintroduced at KS4 and build upon this prior knowledge in order for students to begin manipulating more complex equations.

There is a focus on the use of challenging tier 3 vocabulary to boost the scientific literacy of students and enable them to articulate scientific concepts clearly. Glossaries are provided for each unit and pupils are expected to use these terms in both verbal and written responses. There are opportunities for extended writing within each topic.

The curriculum is differentiated to enable pupils of all abilities to access the full range of topics and skills that are taught throughout the curriculum. We understand that models are an essential part of developing and sharing scientific knowledge and ensure that these are used to explain challenging concepts. Similarly, work is often scaffolded for students for example in the teaching of chemical calculations or describing the stages of natural selection. This is useful in order to build up to the independent completion of tasks, with time allowed for repeated practice to build confidence.

As part of our curriculum we aim to highlight the many rich careers that can be accessed through studying Science. Lessons are the starting point for making links between what is being taught and future careers—there are numerous examples: radiography technician (physics), food analyst (chemistry), conservationist (biology). Additionally, we provide a variety of enrichment opportunities, including outside speakers, workshops, trips and Aspire programme STEM club and robotics club.