

### **Inspiring inquisitive minds through the development of scientific skills, knowledge and understanding**

Science has changed all of our lives and is vital to the world's future prosperity. At SCA, we build on our students' natural curiosity about the world around them 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 also their unique place, impact, role, and responsibilities within it.

Our curriculum provides the foundations for understanding the world through the specific disciplines of biology, chemistry and physics and is split into the two key strands of substantive and disciplinary knowledge. Disciplinary knowledge is developed through regular opportunities for formulating 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. Substantive knowledge and new ideas are introduced in a way that begins with foundational knowledge and progresses to the more complex over time.

There is a clear focus on the use of challenging Tier 3 vocabulary to boost the scientific literacy of students and enable them to articulate complex 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.

### **Curriculum Principles**

All students will study the content outlined in the scheme of learning, which has been constructed based on the following principles.

**Entitlement:** All students study all areas of science with content covered by the National Curriculum added to but never removed. All students study the knowledge and skills specified in the curriculum. Teachers tailor their lessons to meet the needs of each class which ensures all students can access the curriculum and succeed in science.

**Coherence:** The curriculum is sequenced to support the acquisition of knowledge cumulatively, including a range of vertical concepts developed over time in a variety of contexts. For example:

*'Energy is transferred between stores':* Y7 Energy, Y8 Light & Space, Y10 Energy, Y10 Electricity, Y11 Forces

*'Reactions rearrange particles':* Y7 Chemical Reactions, Y8 Atoms & the Periodic Table, Y9 Reactivity, Y9 Energetics & Rates, Y10 Bonding, Y10 Chemical Changes, Y10 Quantitative Chemistry, Y11 Organic Chemistry.

**Mastery:** Scientific concepts are taught in KS3 and again in KS4 to embed knowledge and skills. Interleaving of content is used in class and homework to ensure a deeper understanding of the key strands. Prior learning is always made explicit in schemes of work, and the use of frequent, low-stakes quizzing improves knowledge retention and retrieval. Knowledge and skills are assessed through retrieval practice, homework, and fluency tasks, and this evidence is used to inform future learning. Formative assessment is used rigorously to ensure that misconceptions are identified, addressed, and replaced with correct scientific ideas.

**Adaptability:** The curriculum is differentiated by teachers to enable students of all abilities to access the full range of topics and skills that are taught throughout the curriculum. Learning is tailored to the needs of the students within each class. We understand that models are an essential part of developing and sharing scientific knowledge and ensure that these are used to explain challenging concepts.

**Representation:** A diverse range of names, images and scientists are used in resources throughout the curriculum so that students of all backgrounds and identities recognise the relevance of science and the curriculum is representative of a wide range of countries and cultures. Scientists from a diverse range of backgrounds and of various specialities and roles are highlighted so that all students may feel that they can aspire to a career in STEM.

**Education with Character:** The science curriculum raises several ethical, culturally significant, or sensitive questions which students will want to explore in ways that go beyond the curriculum, such as Stem Cells (B1), Using Resources (C10), and Fertility Treatments (B5). As part of our curriculum, we aim to highlight the many rich careers that can be accessed through studying Science, using lessons as the starting point for making links between what is being taught and future careers. Additionally, we provide a variety of enrichment opportunities, including outside speakers, workshops, trips, extra-curricular STEM, Eco and CREST Award clubs.