



ST GEORGE'S SCHOOL
A CHURCH OF ENGLAND ACADEMY

SCIENCE CURRICULUM

SCIENCE CURRICULUM PHILOSOPHY

Within the Science Department, the curriculum has been coherently planned and sequenced around our philosophy that all pupils must leave St George's with the scientific knowledge, understanding and critical thinking skills needed to make sense of the world around them. We believe that science is fundamental to understanding ourselves, our society, and our future as stewards of God's creation. Through this, all pupils develop the confidence to engage with scientific ideas, evaluate evidence and make informed decisions, empowering them to live out our Christian values in service to the wider world.

We believe that it is essential that pupils develop both scientific literacy and cultural capital, enabling them to understand the increasingly scientific and technological world in which they live. Through the study of science, pupils learn to question, analyse, evaluate and communicate ideas effectively whilst developing resilience, curiosity and independence. Cultivated within an atmosphere of mutual respect and fellowship, our pupils learn to value diverse perspectives, honoring the unique contributions of others to scientific progress. Our curriculum therefore not only promotes a love of science but also nurtures a deeper understanding of how scientific knowledge is developed, challenged and applied.

Our curriculum aims to inspire curiosity about the wonder of creation whilst developing pupils' understanding of the key scientific concepts that underpin biology, chemistry and physics. Through a rigorous focus on scientific vocabulary, literacy and numeracy, pupils gain access to powerful knowledge that allows them to communicate scientific ideas accurately and confidently. Students learn how scientific discoveries have shaped society and how science continues to influence the world around them, instilling a deep sense of moral responsibility to use this knowledge to care for, support, and elevate others.

In the St George's Science Department, we hold scientific enquiry, evidence and critical thinking in the highest esteem and seek to cultivate both proficiency and enjoyment in science. Through the study of scientific models, data, evidence and contemporary scientific issues, pupils develop an understanding of how scientific knowledge is generated, tested and refined. Alongside this, we aim to foster a sense of wonder about the universe, nurturing a shared Christian commitment to addressing global challenges, seeking justice, and improving the quality of life for all.

In order to achieve a true understanding of Science, topics have been intelligently sequenced based on the following rationale:

- We pride ourselves on delivering an interconnected, sequenced curriculum that develops knowledge across biology, chemistry and physics whilst explicitly teaching pupils how scientific knowledge is generated, evaluated and communicated. Students develop both substantive knowledge and disciplinary knowledge, enabling them to think critically about scientific claims and evidence.
- Our curriculum has been carefully planned from Key Stage 3 through to Key Stage 4, ensuring that key concepts are introduced through strong foundations before being revisited and developed in greater depth. This enables pupils to build secure schema and make meaningful connections across topics and disciplines.
- Each academic year, pupils encounter increasingly sophisticated scientific concepts and explanations. Foundational ideas such as cells, particles, energy and forces are revisited and expanded, allowing pupils to develop deeper understanding and greater confidence in applying scientific knowledge.
- Within each scheme of learning, key knowledge and concepts are taught and revisited regularly. Opportunities for retrieval and deliberate practice are built into the curriculum to strengthen long-term memory and ensure pupils retain powerful knowledge over time.
- Topics have been selected and sequenced to increase progressively in challenge whilst remaining accessible to all learners.
- The curriculum has been sequenced to build on prior knowledge from Key Stage 2 and to prepare pupils effectively for the demands of GCSE study.
- Key concepts such as systems, interactions, energy transfer, particle behaviour, evidence, change and cause-and-effect relationships are encountered and revisited throughout the curriculum to create coherence and strengthen understanding.

The Science curriculum will address social disadvantage by addressing gaps in pupils' knowledge and skills:

- The Science curriculum places considerable focus on the explicit teaching of scientific vocabulary, literacy and numeracy to ensure that all pupils can access complex scientific ideas and communicate their understanding effectively.
- We aim to address social disadvantage by exposing pupils to a broad range of scientific concepts, discoveries, innovations and careers, increasing cultural capital and broadening aspirations.
- Through engagement with scientific evidence, contemporary issues and real-world applications, pupils develop an understanding of how science influences society and everyday life.
- Through carefully planned retrieval, responsive teaching and targeted intervention, the department seeks to identify and close gaps in prerequisite knowledge so that all pupils can access the wider curriculum successfully.

We fully believe Science can contribute to the personal development of pupils at St George's:

- The study of science enables pupils to develop a greater understanding of themselves, their health, the environment and the wider universe. Through scientific knowledge, pupils are empowered to make informed decisions and engage responsibly with issues that affect their lives and the community around them.
- In the classroom, pupils discuss and evaluate scientific issues including climate change, sustainability, medical advances, genetics, resource management and emerging technologies. Through these discussions, pupils learn to consider multiple viewpoints, evaluate evidence and communicate their ideas respectfully.
- The curriculum develops resilience, curiosity, analytical thinking and problem-solving skills through the application of knowledge to unfamiliar situations and the evaluation of evidence.
- Students are exposed to a carefully selected and sequenced curriculum that broadens their understanding of local, national and global issues, helping them become informed and responsible citizens.
- The topics and themes studied help pupils understand the impact of science on society, the environment and future generations, preparing them for life in modern Britain through an appreciation of evidence-based decision making and innovation.

Through all key stages, our belief is that exam preparation, practice and home learning should be interleaved with revisited powerful knowledge that has been modelled and taught in lessons.

This knowledge is recalled and applied through a range of activities including retrieval practice, low-stakes quizzing, extended responses, scientific explanations, data interpretation, mathematical application and examination-style questions. Students are encouraged to reflect on their learning, identify misconceptions and strengthen their understanding over time.

Opportunities are built in to make links to the world of work to enhance the careers advice and guidance that pupils are exposed to:

- Students encounter a wide range of careers linked to biology, chemistry and physics, including healthcare, medicine, engineering, environmental science, construction, research, technology, energy production and forensic science.
- Through analysing information, solving problems and communicating scientific ideas, pupils develop transferable skills valued by employers, including communication, critical thinking, collaboration, resilience and analytical reasoning.
- Students learn about the work of scientists, engineers and innovators whose discoveries have transformed society, helping them understand the diverse opportunities available through science-related careers.
- The curriculum highlights the role of science in addressing global challenges such as climate change, disease prevention, sustainable energy production and technological advancement, helping pupils appreciate the relevance of science beyond the classroom.

A true love of Science involves learning about the world beyond the classroom. We teach beyond the specification requirements but ensure pupils are well prepared to be successful in GCSE examinations:

- We believe that learning should be both appreciated and retained for future use. Revision and retrieval strategies are embedded throughout the curriculum to support long-term retention and examination success.
- Students explore scientific phenomena through models, demonstrations, simulations, discussion and real-world contexts, helping them develop a deeper appreciation of the role science plays in everyday life.
- Students engage with contemporary scientific developments, ethical debates and environmental issues, allowing them to apply their knowledge beyond the classroom and develop informed opinions supported by evidence.
- The curriculum is carefully designed to ensure that pupils develop the knowledge, understanding and skills required for success in AQA Combined Science while also fostering curiosity, independence and a lifelong appreciation of science.
- By the end of their studies, pupils will be equipped with the scientific knowledge, analytical skills and confidence required to progress successfully into further education, employment and an increasingly scientific and technological world.

CURRICULUM SEQUENCING

CURRICULUM SEQUENCING - KS3

All children are entitled to a curriculum and to the powerful knowledge that will open doors and maximise their life chances. Below is a high-level overview of the critical knowledge children will learn in this particular subject, at each key stage from Year 7 through to Year 11, in order to equip pupils with the cultural capital they need to succeed in life. The curriculum is planned vertically and horizontally giving thought to the optimum knowledge sequence for building secure schema.

Unit Sequencing		
Year 7	Term 1	• Cells, tissues, organs & systems • The particle model • Forces • Muscles & bones
	Term 2	• Atoms, elements & molecules • Energy • Sexual reproduction in animals • Muscles & separation
	Term 3	• Sound • Ecosystems • Acids & alkalis • Current electricity
Year 8	Term 1	• Breathing & respiration • The periodic table • Energy transfers • Plants & their reproduction
	Term 2	• Metals & their uses • Light • Unicellular organisms • Combustion
	Term 3	• Fluids • Food & nutrition • Rocks

		• Earth & space
Year 9	Term 1	• Genetics & evolution • Reactivity • Forces & motion • Plant growth
	Term 2	• Making materials • Force fields & electromagnets • B1 - Cell biology
	Term 3	• C1 - Atomic structure & the periodic table • P1 - Energy • Transition to GCSE - Working scientifically

CURRICULUM SEQUENCING - KS4

Year 10	Term 1	• B4 - Bioenergetics • C3 - Quantitative chemistry • C4 - Chemical changes • P3 - Particle model
	Term 2	• B6 - Inheritance • P4 - Atomic structure • P5 - Forces
	Term 3	• B7 - Ecology • C5 - Energy changes • C6 - Rates of reaction • C7 - Organic chemistry
Year 11	Term 1	• B5 - Homeostasis • C8 - Chemical analysis • P6 - Waves
	Term 2	• C9 - Atmosphere • C10 - Resources • P7 - Magnetism
	Term 3	• GCSE exam preparation