

# Science

## Overview

Science helps our understanding of the world around us. Everything we know about the universe, from how trees reproduce to what an atom is made up of, is the result of scientific research and experimentation. Human progress throughout history has largely rested on advances in science.

Children are naturally curious about everything and in science we engage that curiosity by exploring everything from the tiny atom to the human body and the ever-expanding universe. The Science curriculum at St Richard Gwyn is designed to increase our pupils' knowledge, skills and understanding of the world around them.

Our curriculum is built on the principles of interleaved learning: pupils will revisit, reinforce and expand their previous knowledge on a short, medium and long-term basis. We also provide students with the skills they need to succeed in life; team working, independence, critical thinking, logical deduction, language skills, mathematical skills and the ability to analyse, interpret and evaluate data to make informed choices in life.



# Science

## KS3

At Key Stage 3, learners are provided with a plethora of opportunities to build on the skills, knowledge and understanding acquired at Key Stage 2. Pupils develop their skills through the range of Interdependence of Organisms, The Sustainable Earth and How Things Work. Key concepts covered at KS3 are:

**Biology** - Living Processes, Plants & Ecosystems, The human body & body systems, Microorganisms & disease

**Chemistry** - Chemical reactions, Earth Science, Pure & Impure substances, The elements & bonding, Rate of reaction, Extraction of metals

**Physics** - Energy & Electricity, Forces, Circuits & Waves, Space, Light

Pupils are taught to apply their scientific skills, knowledge and understanding to design strategies, solve problems and offer explanations, relating to scientific ideas to the information about them, including current issues.

Science activities undertaken at Key stage 3 foster curiosity and creativity. We endeavour to ensure that lessons are interesting, enjoyable, relevant and challenging . Wherever possible we try to enable learners to initiate, explore and share ideas. Lessons in Science enable pupils to extend, refine and apply their skills, knowledge and understanding in new and more abstract situations.

Pupils are given opportunities to study the work of scientists and to recognise the role of experimental data, creative thinking and values in their work and in developing scientific ideas. Lessons encourage pupils to manage their own learning and further develop learning and thinking strategies. Concepts are taught to consider different perspectives, value others' opinions and be responsible global citizens.



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## KS4

At St Richard Gwyn we try to offer a broad range of Science & Technology related GCSE courses; the courses offered include: Triple Science, Double Award Science, Computer Science and ICT.

The courses offered encourage learners to develop confidence in, and a positive attitude towards, science and technology. We aim to make Science and Technology relevant to students lives and to society.

Studying GCSE Sciences provide the foundation for understanding the material world. Scientific understanding is changing our lives and is vital to the world's future prosperity.

In Biology students will appreciate how the complex and diverse phenomena of the natural world can studying body systems, classification and diversity and ecological relationships. In Physics they develop key ideas relating to the forces, electricity and the universe to start to understand the complexities of the universe. Finally, in chemistry they discover the importance of the atom and chemical reactions in every aspect of life on Earth.

Throughout GCSE, pupils are introduced to a wide range of scientific principles which will allow them to enjoy a positive learning experience. At SRG we believe that practical work is an intrinsic part of science and that it is imperative that practical skills are developed throughout the course.



# Science and Technology

## Alevel

Science is a highly popular choice at Sixth Form, with the majority of students choosing at least one Science-based subject in Year 12.

There are five different science related options at A-level and choices are made on potential future career choices as well as interest. It is vital that students have a passion for extending their knowledge beyond GCSE as the courses require high levels of dedication, hard-work, self-motivation and a genuine desire to learn.

Courses offered through the St Richard Gwyn and Flint High School Partnership: Biology, Chemistry, Physics, Medical Science & Computing.

**A-level Biology** is the study of life. At Advanced Level the depth of knowledge becomes greater and the finer detail of Molecular Biology is brought to life. Biology covers many topics, from the intricacies of cell ultra-structure to ecological conservation and the course is an excellent starting point for many university courses including Medicine, Veterinary Science, Biochemistry, Ecology, Environmental Science, Nursing, Optometry and Dentistry.

**A-level Chemistry** is the study of matter, its properties, how and why substances combine or separate to form other substances, and how substances interact with energy. Opportunities for people with a qualification in Chemistry are extensive and include; Agriculture, Accounting, Biology, Engineering, Geology, Medicine, Veterinary Science and Physiotherapy.

**A-level Physics** is the scientific study of matter and energy and their interaction with each other. Physics qualifications are held in very high regard and seen by universities and industry as an excellent grounding for any Further Science or Engineering courses. Physics requires students to grasp abstract concepts, make use of logical thought and solve mathematical problems whilst applying these to a variety of practical situations.

