

BARTON COURT GRAMMAR SCHOOL – SCIENCE DEPARTMENT

Through our delivery of a balanced science curriculum we aim to encourage students to be more curious about the world around them and to ask questions of each other and themselves about how and why things around us work. Additionally we aim to develop the skills that they will need, not only to answer these questions but also to be successful and fulfilled in their future learning in science and beyond.

Key Stage 3

Students follow a condensed National Curriculum in years 7 and 8. The course is arranged into topics which are loosely Biology, Physics or Chemistry based. There is a heavy emphasis on practical work and discovery as well as developing investigative skills. The in-house developed programme is supported by resources from the Activate scheme in addition to other resource packs. Students are taught in mixed ability form groups and have seven sixty minute lessons per fortnight in Years 7 and 8. Students are rewarded through the awarding of BCGS points, in line with whole School policy.

Key Stage 4

The vast majority of students take separate GCSEs in Biology, Chemistry and Physics through the AQA examining board, beginning in Year 9 and completed in three years. In each discipline the POS ensures that taught content is complete by Christmas in Year 11. A series of required practicals are taken in addition to the written exams.

The new science GCSEs which began teaching in 2015 (first examinations 2017) are heavily practically orientated, with practical skills being examined through the written papers at the end, rather than through the coursework route. The department places strong emphasis on rigorous practical work and utilizes the excellent new laboratory facilities in the school. The department uses practical work to underpin learning in science and has incorporated many more than the statutory minimum into the GCSE course.

Topics studied in Biology include ecology, sustainability, microbiology, ethics, molecular biology, human physiology and biochemistry.

Topics studied in Chemistry Atomic structure, the periodic table, Bonding, structure and the properties of matter, Quantitative chemistry, Chemical changes, Energy changes, The rate of chemical change, Organic chemistry, Chemical analysis, Chemistry of the atmosphere and Using resources.

Topics studied in Physics include The Big Bang, electricity generation, nuclear fission and fusion and static electricity.

Key Stage 5

In the sixth form the department offers courses in Biology, Chemistry and Physics at A Level.

Biology

AQA A level Biology continues the study of a wide range of Biology topics. The content, both theory and practical, is examined in Year 13. Students will have the chance to perform cutting edge techniques such as PCR, DNA fingerprinting, p-GLO as well as the more traditional techniques such as pond sampling in our long established St Augustine's fish pond. Students are encouraged to read widely around the topic and many chose to do their Extended Project Qualification in science. The Department runs a successful collaboration with the University of Kent and the Microbiology society to allow students to discover and characterize novel antibiotics from bacteria living in the pond area of the school.

Chemistry

The A Level course follows the OCR (Salters) 'B' specification. This is a highly-regarded 'context-led', rather than 'topic-based', approach to the teaching of chemistry. Chemical principles are introduced within a particular context and then revisited and built upon as the course evolves. The A Level course develops students to have a range of skills, including mathematical skills, analytical, evaluating, and problem solving. All of which are highly applicable and marketable in the modern world. A large part of the chemistry course is practical based and these skills are also developed during the course. Students study topics including: Elements of life, Oceans, Medicine by design and Developing fuels.

Physics

The exam board we have selected for the A2 course is OCR, who offer a comprehensive course that will provide an excellent base for those who wish to continue their studies at University or for those who are looking to use the broad set of skills that an A level in Physics will provide in their future studies and careers. The A Level course requires students to have a range of skills, including mathematical skills, analysing, evaluating and problem solving. Students are required to complete 12 practical tasks for the practical component of the course. Some examples of the topics students studying A Level Physics will cover are: Astrophysics, Thermodynamics, Mechanics, Waves and Quantum Physics.

Resources

The department has 10 well-equipped modern laboratories and 2 large preparation rooms with 2 full time lab technicians to serve them. The science department is equipped with its own range of laptops and we have various data-logging equipment and software that are used in all Key Stages as well as all of the usual equipment that you would expect of a modern grammar school. The biology department moved into purpose built biology labs in the new building at the beginning of 2018. Each teacher has their own lab, one being a dedicated microbiology lab.

The school pond, serves as an exceptional outdoor resource providing homes for toads, frogs and newts as well as the resident ducks and moorhens. In the school grounds are a number of interesting trees including a rare Gingko.

Beyond The Curriculum

The Science department runs a wide range of extra-curricular activities including Cosmetic Biology, Forensics, Dissection, Biochemistry and Gardening Club. The department has close ties with UKC and Christchurch University, which results in visits to these institutions and visits by their staff to Barton Court. Regular trips are arranged to the Science Museum and the Royal Society Summer Exhibition.

The department is successful in getting many students each year into university for a range of courses including medicine, astrophysics, dentistry, chemical, mechanical and biological engineering nursing, biology, physics, chemistry, biotechnology, biomedical sciences and natural sciences. The department arranges visits to local companies using science related technologies and visits to public lectures at the University of Kent. The department encourages leading students to take the British Olympiad and each year we gain medals and highly commended places.
