

# Chemistry

## OCR A Specification



### General information:

This chemistry course aims to develop essential knowledge and understanding of different areas of the subject and how they relate to each other. Students will develop and demonstrate a deep appreciation of the skills, knowledge and understanding of scientific methods. They will become competent and confident in a variety of practical, mathematical and problem-solving skills, as well as developing an enthusiasm and interest in this complex but widely applicable subject.

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### Course content:

In Year 12, the course covers topics such as: atoms, compounds, molecules and equations; amount of substance; acid-base and redox reactions; electrons, bonding and structure; the periodic table and periodicity; group 2 and the halogens; qualitative analysis; enthalpy change; reaction rates and equilibrium; basic concepts in organic chemistry; hydrocarbons, alcohols and halogenoalkanes; organic synthesis; analytical techniques.

In Year 13, the course goes deeper, covering: rates and equilibrium; pH and buffers; enthalpy, entropy and free energy; redox & electrode potentials; transition metals; aromatic compounds, carbonyl compounds, carboxylic acids and esters; nitrogen compounds, polymers, organic synthesis, chromatography; spectroscopy.

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### How is the course taught and assessed?

Chemistry is taught in specially designed labs and classrooms by specialist teachers. Students will have two teachers for the subject, and will be expected to undertake homework and independent study work outside of the classroom. A significant part of the course involves undertaking practical work.

Assessment is by three exam papers and a practical endorsement. The first two exam papers contribute 37% of the grade and the final exam is synoptic and makes up 26% of the final grade. Mathematical skills will make up a minimum of 20% of the questions through the three papers. To pass the practical endorsement element, students are required to carry out a minimum of 12 practical activities although they will over the two years undertake many more practical activities.

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### Entry requirements:

In addition to the general entry requirements for BWS, a grade 7 in GCSE Chemistry or Grade 7,7 in Combined Science and a grade 7 in Maths.

### Results information:

Chemistry is a very successful subject. In 2023, 93% of students achieved grades A\* - C at A level, with 57% A\* - A

### Top destinations for students:

Oxford, Cambridge, Imperial College, Bristol, Exeter, Bath, Southampton to study Medicine, Biomedical Sciences, Chemical Engineering, Chemistry, Veterinary Science, Pharmacology, and many others...

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## Beyond the curriculum:

### Science Enrichment Programme

Science has an extensive enrichment programme which we feel is important in supporting our students with their studies but also their wider thinking with respect to their future career. Student-led groups such as the Young Medics Society and Engineering Society have a varied programme of speakers throughout the year. In addition, the BAYS programme (British Association of Young Scientists) last year provided the students with ten after school talks on a wide range of Scientific topics. In previous years these sessions have included presentations entitled 'Cell division', 'The Exploration of the Geology of the Earth', 'Structural Engineering', 'Nanospace Chemistry', 'Computational Chemistry', 'The Grand Challenges in Medicine', 'Critical Care Medicine' and 'Respiratory Diseases'. Each of these talks was delivered by academics and professionals active in these fields.

### Chemistry Olympiad and Chemistry Challenge Competitions

We run after school preparation sessions for the Chemistry Olympiad competition which is entered by the majority of our A Level Chemists in both Yr12 and Yr13. Last year we had over 70 entries and there were 14 Gold, 13 Silver and 26 Bronze awards achieved, including a Gold award for one of our year 12 students. All of Yr12 also enter the Cambridge University Chemistry Challenge and last year one student achieved the top Roentgenium award which placed him in the top 0.05% nationally with 5 other students achieving Gold, 10 Silver and 18 Bronze awards.

### STEM Careers Conference

In March each year we run a STEM conference where Year 12 students listen to a keynote talk and then have the opportunity to attend two of a range of workshops delivered by speakers across a broad range of STEM areas.

### Support for Medics, Vets and Dentists

In addition to students attending the Young Medics talks we also offer support to students with application advice and interview sessions.

### Visits to University Chemistry departments

Students interested in studying Chemistry have had the opportunity to apply for a day of work shadowing at a Southampton University chemistry lab, and trips to twilight practical sessions in undergraduate practical laboratories.

### BWS is an Arkwright Affiliated School

We presently have 10 Arkwright Engineering Scholars. This affiliation provides our students with a range of opportunities for those boys who are interested in engineering including chemical engineering.

### Leadership Opportunities within Science

We have Science prefects who co-ordinate the work of students in Yr12 and Yr13 in leading science wide activities. Students in Yr12 and Yr13 are also encouraged to act as role models and to support the learning of younger students by way of small group mentoring run at lunchtimes.