



St George's School
CHEMISTRY
KS5 Curriculum

PREREQUISITE KNOWLEDGE & SKILLS <i>The foundations needed to thrive in this subject.</i>	Who should study this subject? Students who are logical, analytical, numerate, can appreciate concepts and models and enjoy problem solving will thrive on this course. An interest in Chemistry is vital as is a desire to learn and understand new chemical concepts and principles and being keen to develop scientific practical skills with a range of equipment and techniques. Key Skills developed during KS4: Knowledge and understanding of the basic principles of Chemistry such as atomic structure and bonding, reactions of acids, rate of reaction, balancing equations and calculating reacting masses. Understanding of scientific method from GCSE required practicals. The ability to write clearly and logically and perform simple calculations such as ratios and percentages is essential. St George's course entry requirements: GCSE Combined Science: 6 or GCSE Chemistry: 6 plus Mathematics: 6 in addition to sixth form entry requirements. It is strongly advised to reach grade 7 or above in the Chemistry papers of Double or Separate Science to cope with the more challenging A Level content and a grade 7 or above in GCSE Maths due to the very numerate nature of the Chemistry A level.
QUALIFICATION <i>Exam Board, aims and objectives.</i>	A Level Chemistry, AQA 7405 This course aims: • To give students a deeper understanding of the wonders of the Periodic Table, to learn how and why many reactions happen and how to synthesise a range of organic materials. • To develop sound practical skills in safe and accurate handling of equipment • To develop powers of analysis, problem solving and critical thinking skills and the ability to understand concepts and models. • To provide a basis for the understanding of all scientific disciplines. • To develop crucial employability skills such as researching, report writing, team work and communication skills. Course Objectives • AO1: Demonstrate knowledge and understanding of scientific ideas, processes, techniques and procedures • AO2: Apply knowledge and understanding of scientific ideas, processes, techniques and procedures: in a theoretical context; in a practical context; when handling qualitative data; when handling quantitative data • AO3: Analyse, interpret and evaluate scientific information, ideas and evidence, including in relation to issues, to: make judgements and reach conclusions; develop and refine practical design and procedures
ASSESSMENT <i>Internal monitoring and final assessment.</i>	Internal Assessment: Year 12 End of Year assessment (Summer term) Year 13 Mock exam (Spring term) Required practicals - 12 practicals (some in several parts) assessed throughout the course Final assessment: Three, equally weighted, two-hour long written exams at the end of course • Paper 1 - Inorganic and Physical Chemistry including relevant practical skills • Paper 2 - Organic and Physical Chemistry including relevant practical skills • Paper 3 - All topics and all practical skills Practical assessment (pass/fail) – teacher assessed. This does not directly contribute to the overall A level grade but a pass is essential for most science-based degree courses. Practical techniques and general scientific skills are assessed within the written exams.

ENRICHMENT <i>Trips & Visits, wider reading, etc.</i>	Visits and Events: Cambridge Chemistry Challenge (an Olympiad style competition for year 12 and below). RSC Chemistry Olympiad competition, held in January is open to year 13 chemists. A level Chemistry Live! Event in London for year 13 chemists.
NEXT STEPS <i>Where this subject can take you.</i>	Related University Courses: Chemistry, Biochemistry, Pharmacy, Forensic Science, Natural Sciences, Material Science, Environmental Science, Medicine, Dentistry, Veterinary medicine plus many other science or engineering related courses. Career Paths: Academia, research scientist within the chemical, biochemical or pharmaceutical industries. Medical careers such as doctors, dentists, vets, pharmacists, paramedics, nurses or forensic scientists. Careers in food technology, materials science, chemical engineering, environmental science, teaching and scientific journalism. As a strong academic A Level can also lead to careers in computing, law, business and finance.

Year 12	
Autumn Term	Topics: Atomic structure, Amount of substance, Bonding, Energetics, Introduction to Organic Chemistry, Alkanes, Halogenoalkanes. Required practicals - making volumetric solution, acid-base titration, measuring enthalpy. Skills: Knowledge of chemical facts, understanding conceptual models, expression to explain concepts, mathematical, problem-solving, nomenclature, use of curly arrows, basic practical skills, presentation of analytical data, risk assessment. Assessment: End of topic tests; Required practical lab reports.
Spring Term	Topics: Redox reactions, Group 2, Group 7, Kinetics, Chemical Equilibria and K _c , Alkenes, Alcohols, Chemical Analysis. Required practicals - investigating rate changes, inorganic test tube identification tests, distillation. Skills: Knowledge of chemical facts, half equations, expression of logical reasoning, mathematical, problem-solving, organic mechanisms, observational skills, practical skills, presentation of analytical data, risk assessment. Assessment: End of topic tests; Required practical lab reports.
Summer Term	Topics: Transition metals, Kinetics, Organic nomenclature and Isomerism Required practicals - organic test tube identification tests, measuring rate of reaction by initial rate and continuous rate methods. Skills: Knowledge of chemical facts, mathematical, problem-solving, nomenclature, observational skills, practical skills, presentation of analytical data, independent research. Assessment: End of topic tests; Required practical lab reports.

Year 13	
Autumn Term	Topics: Ions in aqueous solution, Thermodynamics, Electrode potentials and Electrochemical cells, Aldehydes and ketones, Carboxylic acids and derivatives, Aromatic Chemistry. Required practicals - preparation of aspirin, measuring EMF of electrochemical cells, test tube reactions with transition metals in solution. Skills: Knowledge of chemical facts, mathematical, problem-solving, organic mechanisms, observational skills, practical skills, independent research. Assessment: End of topic tests; Required practical lab reports.
Spring Term	Topics: Acids, bases and buffers, Equilibrium constant K_p, Periodicity, Polymers, Amines, Amino Acids, Proteins and DNA, Organic Synthesis, Chromatography. Required practicals - pH titration, Preparation of an organic liquid, Thin layer Chromatography. Skills: Knowledge of chemical facts, mathematical, problem-solving, observational skills, practical skills. Assessment: End of topic tests; Required practical lab reports.
Summer Term	Topics: Revision of all topics including required practicals. Skills: Consolidation of course content, synoptic links between topics, past exam question practice. Assessment: Final A level exam papers (see above)