

Year 12 Chemistry

Students follow the AQA two year A-level course. The course is split between year one and year two. The AS content is taught first with the A-level content, starting at the end of Year 12 and into Year 13. Initially students are taught the basic chemistry ideas which underpin the more complex concepts which are encountered as the course progresses. There are two teachers delivering the A-level course, each teacher will deliver a combination of physical, inorganic and organic chemistry. Through the course practical skills are developed and competencies are assessed so that evidence is built up towards the awarding of the practical endorsement at the end of Year 13. These skills are developed in context, when the appropriate practical opportunity allows for it. Students are assessed every term with a progress assessment with builds in volume and complexity as the year progresses. In addition students complete smaller tests at the end-of-topics which allows strengths and weaknesses in specific topics areas to identified.

Methods of deepening and securing knowledge:	
Spaced practice	Many topics are revisited from year one to year two of the course. The ideas from the Bonding topic run through many other topics both later in Year 12 as well as in Year 13, for example periodicity and organic chemistry. The principles in the Energetics topic in year one are seen again, and expanded upon, in Thermodynamics in year two. The analytical techniques visited during the Organic analysis topic are revisited in Organic synthesis.
Retrieval practice	The vast majority of topics studied at A-level build on ideas from GCSE chemistry, this necessitates the need for retrieval of this prior learning, especially in the early part of the A-level course. In addition, the fundamental topics of Atomic structure, Amount of substance and Bonding, covered at the beginning of year one act as the building blocks for all other topics covered over the two year course. The knowledge from these topics therefore is continually revisited, retrieved and expanded upon.
Concrete examples	There are many abstract concepts taught throughout the chemistry curriculum. The teaching of concrete examples are used to either make them more accessible or because of the requirements of assessments.
Dual coding	Students encounter many examples of graphical or diagrammatic representations of data and chemistry concepts.

	Autumn term one	Autumn term two	Spring term one	Spring term two	Summer term one	Summer term two
Topic(s)	Atomic structure - The structure of the atom, electron configuration, time of flight mass spectrometry, ionisation energies Amount of substance - The mole, ideal gas equation, equations and calculations,		Kinetics - Reaction rates and Maxwell-Boltzmann distributions Periodicity - Examining trends in physical and chemical properties as you move across periods in the periodic table	Halogenoalkanes - Chloroalkanes and CFCs, nucleophilic substitution and elimination reactions Alkenes and alcohols - Electrophilic addition reactions, testing for alkenes, addition polymers,	Revision for PPE (Preparation for AS exams) Year two content: Thermodynamics - Enthalpy definitions, lattice enthalpy and Born-Haber cycles,	

	titrations, formulas, yield and atom economy Bonding - Ionic, covalent and metallic bonding, shapes of molecules, intermolecular forces and properties of materials Energetics - Enthalpy changes, calorimetry and Hess's law Equilibria and redox - Dynamic equilibrium, Le Chatelier's principle, the Equilibrium constant, half equations		Group two and group 7 - Physical and chemical properties of the group two and group 7 elements, uses of group two elements, halide ions and tests for ions Introduction to organic chemistry - Nomenclature, representing organic molecules, isomerism Alkanes - Alkanes and petroleum, fractional distillation and alkanes as fuels	reactions of alcohols, ethanol production, oxidation of alcohols Organic analysis - Tests for functional groups and analytical techniques	enthalpies of solution, entropy, free energy Optical isomerism - Examining non-superimposable mirror image molecules NMR spectroscopy and chromatography - How NMR spectroscopy works, interpreting NMR spectra, thin layer chromatography, column chromatography and gas chromatography	
Assessment	- End-of-topic reviews - Aiming High one assessment	- End-of-topic reviews - Progress test two (Progress tests examine all content covered from the beginning of the year)	- End-of-topic reviews - Progress test 3	- End-of-topic reviews - Progress test 4	- End-of-topic reviews - Progress test 5	- End-of-topic reviews - Pre-public examination

Independent learning:

Regular independent learning is set to establish, reinforce and revisit key concepts throughout the course.

Best Choice, an online learning platform, is used in conjunction with other forms of independent learning to give students a way of checking understanding while getting immediate feedback.

Revision tasks, including completion of past exam papers are used in the lead in to Aiming High assessments and formal examinations.