

KS5 Long Term Curriculum Plan: A LEVEL CHEMISTRY Year 12 2021-2022

Curriculum Aim: A level Chemistry attempts to answer the big question 'what is the world made of' and its search for this answer that makes this subject so fascinating. From Investigating how one substance can be changed drastically into another, to researching a new wonder drug to save millions of lives, the opportunities that chemistry provides are endless. Throughout the course students will be learning the 3 main areas of chemistry: Physical Chemistry, Inorganic Chemistry and Organic Chemistry. The course prepares students for further study.

Link to prior learning: The subject builds on key knowledge and skills from GCSE Sciences, whilst diving deeper into key topics such as atomic structure, amount of substance and bonding.

Rationale of sequencing: We begin the course by focusing and developing on essential skills from GCSE on atomic structure and amount of substance. These underpin the content for all other topics covered, thus students learn the essential calculations and knowledge to access the topics later in the course. Throughout all topics we practice essential practical skills. Topics link from one to another, we use continuous recall starters to embed content.

	Focus / Topic	Knowledge & Skills (from NC/Programmes of Study)	Assessment
Autumn 1	Atomic Structure Amount of substance	Students will gain an understanding of: <ul style="list-style-type: none"> • The structure of the atom and how mass spectrometers are used to measure mass of atoms. • The evidence for the arrangement of electrons including sophisticated model of atomic orbitals. • Calculations involving moles, masses, Mr, concentration, and volume. • Revisit ionic, covalent and metallic bonding and introduce intermolecular forces. • Examine forces involved in states of matter and explore shapes of molecules and ions. • Gives an overview of the Periodic Table and classifies blocks of elements. • Studies properties of elements in Period 3. • Describe enthalpy change of combustion and formation quantitatively including Hess's Law. Students develop skills such as reporting calculations to an appropriate number of significant figures and calculations using Avogadro's constant. Calculate weighted means, empirical formula and interpret/analyse spectra. Students will learn how to make up volumetric solutions and draw diagrams to represent structures. Perform calculations of an enthalpy change.	Baseline exam to assess students GCSE knowledge that is essential for the A level course. w/b 6th September 2021
Autumn 2	Bonding Periodicity Energetics		Paper 1 style exam on all content taught so far. Assessment week (w/b 15th Nov 2021)
Spring 1	Kinetics Introduction to Organic Chemistry Alkanes	Students will gain knowledge on: <ul style="list-style-type: none"> • Using kinetic theory factors affecting rates of reaction incorporation Maxwell- Boltzmann distribution. The nature of carbon compounds and different types of formulae used to represent compounds. • Using IUPAC naming system to name compounds and looks at types of isomerism. • Crude oil and its fractional distillation, combustion and making smaller alkanes by cracking. Students develop skills such as draw and interpret distribution curves for different temperatures. Draw structural, displayed and skeletal formulas for given organic compounds. Ability to rearrange equations to discover the relationships between variables.	

Spring 2	Equilibria Halogenoalkanes Alkenes	<p>Students will gain knowledge of:</p> <ul style="list-style-type: none"> ● Le Chatelier's Principle to explain the factors that affect the position of equilibrium. ● How these compounds are formed, react and their role in depleting the ozone layer. ● The reactions of these compounds which have one or more double bonds. <p>Students develop skills such as calculating the concentration of a reagent at equilibrium and the value of an equilibrium constant K_c</p>	<p>2 x Year 1 style papers on all content covered to this date. 1 paper per teacher.</p> <p>Assessment week (w/b 21st Feb 2022)</p>
Summer 1	Redox Alcohols Organic Analysis	<p>Students will gain knowledge of:</p> <ul style="list-style-type: none"> ● Half equations to explain redox reactions in terms of energy transfer. ● The importance of ethanol and describes the structure and their reactions. ● The use of a mass spectrometer. ● The use of Infra-red spectroscopy as an important tool for identifying functional groups in organic chemistry. <p>Students develop skills such as writing half-equations, identifying oxidation and reduction processes in redox reactions and practical skills such as purification by distillation and the tests for alcohols aldehyde, alkene and carboxylic acid.</p>	
Summer 2	Group 2 & 7 elements Isomerism in Organic Chemistry	<p>Students will gain knowledge of:</p> <ul style="list-style-type: none"> ● The trends and patterns in Group 2 and Group 7 elements. ● IUPAC naming system is revisited and applied to further families of organic compounds. ● Optical isomerism based on mirror image molecules is introduced. <p>Students develop skills such as researching practical methods, recording observations and the tests for halide ions. They will also learn to draw the structural formulas and displayed formulas of enantiomers</p>	<p>End of year Mock based on Year 1 content. End of Year exams (w/b 20th June 2022)</p>

Further Information

The Course Specification: <https://filestore.aqa.org.uk/resources/chemistry/specifications/AQA-7404-7405-SP-2015.PDF>

All topics will be assessed with an end of module exam (every 3-4 weeks). Practical skills will be assessed throughout the course during required practical's. Students are expected to complete 5 hours of additional study per week for this course.