



The Island VI Form

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Post-16 Curriculum - Chemistry

Subject Curriculum Overview

Subject	Chemistry
Qualification / Specification	Chemistry A H432
Awarding Body	Cambridge OCR
Level	3
Curriculum Lead	Paul Clarkson
Teaching Staff	Syretta West
Guided Learning Hours	360
Year(s) Delivered	12 & 13
Last Review Date	June 2026
Next Review Date	June 2027

1. Curriculum Intent

OCR's A Level in Chemistry A specification aims to encourage learners to:

- develop essential knowledge and understanding of different areas chemistry and how they relate to each other
- develop and demonstrate a deep appreciation of the skills, knowledge and understanding of scientific methods
- develop competence and confidence in a variety of practical, mathematical and problem solving skills
- develop their interest in and enthusiasm for chemistry, including developing an interest in further study and careers associated with the subject
- understand how society makes decisions about scientific issues and how the sciences contribute to the success of the economy and society (as exemplified in 'How Science Works' (HSW)).
- All of the knowledge and transferable skills learnt throughout the A level Chemistry course can lead to lots of different careers not just within science. Obviously the following professions and courses link directly to this course@
 - Medicine, dentistry and veterinary
 - Chemistry, Chemical engineering and materials science.
 - Biochemistry, Biomedical and Biosciences
 - Geology

- Success in A-Level Chemistry requires transitioning from simply memorising facts at GCSE to mastering three core pillars: content recall, application to unfamiliar scenarios, and precise exam technique.
 - Success will be the ability to understand and apply core ideas flexibly, rather than recall isolated facts, to both familiar and unfamiliar contexts.
 - To apply maths skills in a chemistry context to solve calculations
 - To coherently explain ideas using the correct terminology. To problem solve and think through concepts and ideas to consider different causes and effects.
 - Carry out practical investigations independently, safely and accurately, making adjustments as needed whilst following complex methods and using specialist equipment.
 - To analyse and present data patterns and to apply knowledge to form conclusions.
 - To evaluate data and methods whilst considering the impact of multiple variables on the outcomes.

2. Foundational Knowledge

Area	Essential Knowledge / Skills	Why It Matters
Atomic structure and periodic table	Atomic orbitals, Structure of the periodic table. Trends in groups and periods.	Relates to how and why chemicals react. Organisation, links to reactivity and electron configuration, essential numbers for calculations and creating formulas.
Inorganic chemistry	Transition metal properties as related to electronic structure; Complex ions Ligand substitution reactions	Link with properties of metals and also application of covalent bonding, shapes of molecules, redox reactions
Bonding	Covalent bonding, dative bonding, double bonds Ionic and metallic bonding Aromatic compounds Intermolecular bonding Electronegativity Shapes of molecules Isomerism	Links to properties of elements, molecules, and compounds. Basic fundamentals of organic chemistry. Basic principles that are the foundation behind polar and non-polar molecules, gives rise to the molecules possible reactions.
Chemical changes, redox and acids	Bronstead-lowry acid theory. Determination of equilibrium constants for weak and strong acids. Buffer solutions. Redox as electrons lost and gained. Electrode potentials and their uses;	Basic chemical reactions with acids. Fundamental knowledge of acids and bases. Calculations involving pH and buffers. Linking redox reactions with batteries and fuel cells.

Organic chemistry	Homologous series Organic synthesis; Alkanes are useful as fuel, Polymerisation; Addition polymerisation and condensation polymerisation; Nucleophiles and electrophiles, Mechanisms for radical, nucleophilic and electrophilic reactions;	Basic organic knowledge of reactions, mechanisms and uses. Links to aromatic and the application of these reactions and production of pharmaceuticals in the real world.
Rate, equilibrium and thermodynamics	Define rate of reaction, rate constant and order of reaction, Determination of rate equations, orders of reaction and the rate limiting step by taking tangents from graphs, Heterogeneous catalysis; Collision theory, Boltzmann distribution and activation energy, enthalpy profile diagrams. Enthalpy, entropy, equilibrium and feasibility of a reaction.	Fundamentals of how fast and why a reaction occurs. Application to organic chemistry mechanisms and production yields. Fundamental explanations of reaction pathways and benefits of changing factors in industry.
Chemical symbols, units and calculations	Balancing equations including ionic and half equations. Conservation of mass. Reacting masses	Basic fundamentals of reaction moles. Being able to predict quantities or calculate quantities required to produce chemicals.
Chemical analysis and preparation	Titration calculations, Chromatography, melting point, Modern analytical techniques and mass spectroscopy.	All ways you can identify the quality and quantity of your product. Application of this knowledge is vital.

3. Powerful Knowledge

Powerful Knowledge Area	Why It Matters	Evidence of Understanding
Modelling of concepts	Being able to model and talk through difficult concepts enables a deeper level of understanding leading to application of knowledge.	Able to answer application questions.
PAG's 3,4,5,6,7,8,9,11.	Problem solving skills, application of knowledge learnt to solve these problems.	Written reports in lab books and observation records. All meeting CPAC specifications
PAG 12	Research skill, writing lab reports, problem solving	Completion of practical and full laboratory write up. Meeting CPAC specifications.
Plan multi step organic synthetic pathways	Gain problem solving skills. Looking specifically at the functional groups to apply to any molecule.	Practice questions, Olympiad, Practicals PAG 5 and 6.
Application of several analytical sources to solve the identity of an unknown sample	Problem solving, ability to link data and ideas,	Olympiad, Royal Society of Chemistry problem solving activities.
Trips to working laboratories, universities	To see the actual chemistry and other science disciplines in action. Also get to complete practicals in a university environment.	Attendance to trip
Watching scientific documentaries or reading articles and papers.	See the wider meaning behind the fundamental aspects of science. Relate the basic knowledge to different topics.	Application of knowledge within class. Completion of extension tasks on homework. Confidence to tackle difficult application questions in exams.

Olympiad	Pushes the boundaries of chemistry beyond A level. Demonstrating logical and problem solving skills in various scenarios.	Certification Bronze, Silver and Gold. Also opportunity to progress to national and international competitions.
STEM	Experimental problem solving	Attend a STEM club, coming up with ideas of areas of science to investigate. Relates basic knowledge and links to very different scenarios.
Paper 3	Synoptic exam paper. Pulls from all aspects of the A level curriculum, questions are fully applied to unknown scenarios.	Grade C or above in this paper.

4. Curriculum Implementation

Term / Unit	Key Content	Foundational Knowledge	Powerful Knowledge	Assessment Opportunities
Yr 12 - Autumn 1	Atoms formulas and moles. Electrons, structure and bonding	Atomic orbitals, Covalent bonding, dative bonding, double bonds Ionic and metallic bonding Aromatic compounds Intermolecular bonding Electronegativity Shapes of molecules Isomerism	PAG 1 STEM Articles on history of atom Radiation demo Modelling	Home work Articles to read and summarise Recall questions
Yr 12 - Autumn 2	Reactions and calculations The periodic table	Structure of the periodic table. Trends in groups and periods. Bronstead-lowry acid theory. Balancing equations including ionic and half equations. Conservation of mass. Reacting masses	PAG 2 Problem solving the periodic table STEM	Home work Articles to read and summarise Recall questions Formal in class assessment

Yr 12 - Spring 1	The periodic table Basic organic chemistry.	Structure of the periodic table. Trends in groups and periods. Homologous series Organic synthesis; Alkanes are useful as fuel,	PAG 4 STEM Modelling	Home work Articles to read and summarise Recall questions
Yr 12 - Spring 2	Alcohols, haloalkanes. Enthalpy changes	Polymerisation; Addition polymerisation and condensation polymerisation; Nucleophiles and electrophiles, Mechanisms for radical, nucleophilic and electrophilic reactions	PAG 5 PAG 3 STEM Modelling	Home work Articles to read and summarise Recall questions Formal assessment
Yr 12 - Summer 1	Analysis and organic synthesis Rate and equilibrium	Define rate of reaction, Heterogeneous catalysis; Collision theory, Boltzmann distribution and activation energy, enthalpy profile diagrams.	RSC resource identifying narcotics from spectra STEM Modelling	Home work Articles to read and summarise Recall questions
Yr 12 - Summer 2	Revision, Transition metals	Transition metal properties as related to electronic structure; Complex ions Ligand substitution reactions	PAG 12 Southampton University workshop trip STEM Modelling	Home work Articles to read and summarise Recall questions AS exam papers in exam conditions
Yr 13 - Autumn 1	Rates of reaction.	Define rate of reaction, rate	PAG 9 & 10 STEM	Home work Articles to read and summarise

	Aromatic chemistry	constant and order of reaction, Determination of rate equations, orders of reaction and the rate limiting step by taking tangents from graphs, Heterogeneous catalysis; Collision theory, Boltzmann distribution and activation energy, enthalpy profile diagrams. Enthalpy, entropy, equilibrium and feasibility of a reaction.	Modelling	Recall questions
Yr 13 - Autumn 2	Carbonyl compounds Equilibrium pH and buffers	Determination of equilibrium constants for weak and strong acids. Buffer solutions. Redox as electrons lost and gained. Electrode potentials and their uses;	PAG 11 STEM Modelling	Home work Articles to read and summarise Recall questions Y13 Mock exam
Yr 13 - Spring 1	Carboxylic acids Enthalpy Nitrogen compounds Organic synthesis	Addition polymerisation and condensation polymerisation; Nucleophiles and electrophiles, Mechanisms for radical, nucleophilic and	Olympiad STEM Modelling	Home work Articles to read and summarise Recall questions

		electrophilic reactions;		
Yr 13 - Spring 2	Redox and electrode potentials Transition metals Organic analysis	Transition metal properties as related to electronic structure; Complex ions Ligand substitution reactions Chromatography, melting point, Modern analytical techniques and mass spectroscopy.	PAG 8 STEM Modelling	Home work Articles to read and summarise Recall questions Formal assessment paper 1
Yr 13 - Summer 2	Practical organic Synthesis PAG catch up and revision Paper 3 practice	All basic principle of the specification	PAG 6 Application based resources STEM Modelling	Home work Articles to read and summarise Recall questions Paper 2 In class Mock of Paper 3

5. Assessment Strategy

Assessment Type	Purpose	Frequency
Diagnostic	Check learning, check misconception, gaps in knowledge.	Every lesson throughout. Before a new topic.
Formative	During lessons - gaps in learning.	Every lesson: Plenary, summaries, retrieval
Summative	End of unit/term demonstrates knowledge & skills to date.	Every week: power hour questions, summaries, other HWk tasks. Termly or less: End of topic test/learning to date tests.
Synoptic	The whole subject.	End of year exams and full mock exams. Retrieval tasks during lessons.