

Key Stage 5 Subject Timeline Year 12 to 13

Subject: Chemistry

Exam Board: OCR A

KS5 Chemistry - Year 12							
Autumn 1		Autumn 2		Spring 1	Spring 2	Summer 1	Summer 2
<p><u>Throughout the Course: Module 1 – Development of practical skills in chemistry</u></p> <p>Teaching of Specification Section 1.1 – Practical skills assessed in a written examination should be embedded in teaching throughout via supporting practical work, ideally combined with teaching of the practical techniques and procedures included in Modules 2–6. Carefully chosen practical work can be used to develop and assess competency in practical skills as part of the Practical Endorsement, as outlined in Section 1.2.</p>							
Topics	<p>Module 2: Foundation in Chemistry <i>Atomic structure & Isotopes, Compounds & Equations, Amount of a Substance, Acids, Redox, Electrons bonding & Structure</i></p>	<p>Module 2: Foundation in Chemistry <i>Atomic structure & Isotopes, Compounds & Equations, Amount of a Substance, Acids, Redox, Electrons bonding & Structure</i></p>	<p>Module 3: Periodic Table and Energy <i>Periodicity, Group 2, Enthalpy Changes, Reaction Rates</i></p> <p>Module 4: Core Organic Chemistry <i>Basic concepts of Organic Chemistry, Hydrocarbons, Alcohols</i></p>		<p>Module 3: Periodic Table and Energy <i>Reaction Rates and Chemical Equilibrium</i></p> <p>Module 5: equilibrium constant Kc (part 2)</p> <p>Module 4: Core Organic Chemistry <i>Organic Synthesis</i></p> <p>Module 6: Organic chemistry and analysis <i>Carbonyl compounds, aldehydes and ketones, carboxylic acids and derivatives</i></p>		
Key skills and Concepts	<p>Module 2 <u>Key Concept</u> – atomic structure, quantitative chemistry: formulae, equations, amount of substance and the mole, reactions of acids, oxidation number and redox reactions, bonding and structure.</p> <p><u>Supporting Practical Work</u> - experiments requiring measurement of mass and volume (liquids, solutions and gases), and calculations related to amount of substance (PAG1), reactions of acids, acid–base titrations (PAG2)</p>		<p>Module 3 <u>Key Concept</u> – the periodic table: periodic and group properties, enthalpy changes and their determination, rates of reaction, reversible reactions and chemical equilibrium, consideration of energy and yield in improving sustainability.</p> <p><u>Supporting practical work</u> - reactions of Group 2 elements, reactions of halogens and halide displacement reactions, qualitative analysis of inorganic ions (PAG4), determination of enthalpy changes (PAG3), investigation of reaction rates (PAG 9)</p> <p>Module 4 <u>Key Concept</u> - nomenclature and formula representation, functional groups, organic reactions and isomerism, aliphatic hydrocarbons, alcohols, organic practical skills and organic synthesis, instrumental analytical techniques to provide evidence of structural features in molecules.</p> <p><u>Supporting practical work</u> - reaction of bromine with cyclohexane and cyclohexene, reactions of alcohols, qualitative analysis of organic functional groups</p>		<p>Module 3 <u>Key Concept</u> – the periodic table: periodic and group properties, enthalpy changes and their determination, rates of reaction, reversible reactions and chemical equilibrium, consideration of energy and yield in improving sustainability.</p> <p><u>Suggested practical work</u> - investigation of changes to the position of equilibrium in response to changes in concentration, temperature and in the presence of a catalyst, investigation of reaction rates (PAG 9 and PAG 10)</p> <p>Module 4 <u>Key Concept</u> - nomenclature and formula representation, functional groups, organic reactions and isomerism, aliphatic hydrocarbons, alcohols, organic practical skills and organic synthesis, instrumental analytical techniques to provide evidence of structural features in molecules.</p> <p><u>Suggested practical work</u> - synthesis of an organic liquid (PAG5)</p> <p>Module 6 <u>Key Concept</u> – carbonyl compounds, carboxylic acids and esters</p> <p><u>Suggested practical work</u> - reactions of carbonyl compounds and esters qualitative analysis of organic functional groups (PAG7)</p>		
Endpoints	<ul style="list-style-type: none"> - Understanding of atomic structure and electron configuration to explain bonding types. - Using quantitative calculations and techniques to describe the process of redox reactions. 	<ul style="list-style-type: none"> - Understanding of atomic structure and electron configuration to explain bonding types. - Using quantitative calculations and techniques to describe the process of redox reactions. 	<p>Module 3</p> <ul style="list-style-type: none"> - Understanding of the periodic table and trends - Explaining Redox reactions and reactivity of group 2 and 7 elements 	<p>Module 4</p> <ul style="list-style-type: none"> - Naming and representing the formulae of organic compounds - Understanding of functional groups, and reaction mechanisms of alkanes, alkenes and alcohols 	<p>Module 3</p> <p>Develop important qualitative practical skills, especially observational skills required for analysis, and accurate quantitative techniques involved in determination of energy changes and reaction rates</p>	<p>Module 4</p> <p>Develop understanding of isomerism, organic practical skills and organic synthesis and instrumental analytical techniques</p> <p>Module 6</p> <p>Develop understanding of new functional groups: carbonyl compounds and carboxylic acids</p>	
Assessmen	Module 2 Midpoint Assessment	Module 2 End of Chapter Assessment Year 12 PPE's	Module 3 Midpoint Assessment Module 4 Midpoint Assessment		Revision End of Year 12 PPE's		

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Topics	Module 5: Physical chemistry and transition elements <i>Rates, equilibrium and pH</i>				Module 5: Physical chemistry and transition elements <i>Energy and Transition elements</i>				Revision		Exams	
	Module 6: Organic Chemistry and Analysis <i>Aromatic compounds, carbonyls and acids, Amines</i>				Module 6: Organic Chemistry and Analysis <i>Amines and Analysis</i>				PAG Repeats/Catch-up			
Key skills and Concepts	Module 5 <u>Key Concept</u> - rate equations, orders of reaction, the rate determining step, equilibrium constants, Kc and Kp, acid–base equilibria including pH, Ka and buffer solutions <u>Suggested practical work</u> - investigation of reaction rates using both initial rate and continuous monitoring methods (PAG9, PAG10), determination of quantities present in a mixture at equilibrium, measurement of pH (PAG11)				Module 5 <u>Key Concept</u> - lattice enthalpy and Born–Haber cycles, entropy and free energy, electrochemical cells, redox chemistry, transition elements. <u>Suggested practical work</u> - redox titrations, measurement of cell potentials (PAG8), ligand substitution, precipitation and redox reactions, qualitative analysis of inorganic ions (PAG4), completion of Practical Endorsement (if required; PAG12 if not yet completed).				Revision		Revision	
	Module 6 <u>Key Concept</u> - aromatic compounds, carboxylic acids and esters, organic nitrogen compounds: amines and amino acids, polymerisation: addition polymers and condensation polymers, <u>Suggested practical work</u> - reactions of carbonyl compounds and esters qualitative analysis of organic functional groups (PAG7)				Module 6 <u>Key Concept</u> - organic nitrogen compounds: amines and amino acids, polymerisation: addition polymers and condensation polymers, synthetic organic chemistry and further development of practical skills, the importance of modern analytical techniques in organic analysis. <u>Suggested practical work</u> - synthesis of an organic solid (PAG6), qualitative analysis of organic functional groups (PAG7), completion of Practical Endorsement (if required; PAG12 if not yet completed).				PAG Repeats/Catch-up		PAG Repeats/Catch-up	
Endpoints	Module 5 - Demonstrate orders, rate equations and rate constants - Understanding of equilibrium and Brønsted–Lowry acids and bases		Module 6 - Understanding of Benzene and aromatic compounds, electrophilic substitution, and phenols - Explain reactions of carbonyl compounds, amines and amino acids		Module 5 - Explain the term lattice enthalpy and Born–Haber and related enthalpy cycles - Explain and use of the term ligand - Explain a ligand substitution		Module 6 - Explain amines and amino acids - Identify appropriate synthetic routes					
Assessment	Module 5 Midpoint Assessment				Module 5 End of Chapter Assessment				Revision		Year 13 A Level Exams	
	Module 6 Midpoint Assessment				Module 6 End of Chapter Assessment							
	Year 13 PPE											