Year 12: Chemistry	**Curriculum Intent:** Students follow the two-year OCR A-Level (A) Chemistry specification building on their existing knowledge from GCSE. Year 12 focuses on the foundations in chemistry in the autumn term; atomic structure, structure and bonding, amount of substance, periodic trends and titration. Spring term starts to develop the areas of organic and physical chemistry to prepare for some more difficult concepts. Basic organic nomenclature and reactions of functional groups, reaction mechanisms and synthesis of organic compounds form the majority of what is learnt, with key practical skills and techniques being developed alongside this. This consolidates the base knowledge needed to move onto more complex aromatic chemistry and multi-step synthesis in year 13. In Physical chemistry, concepts such as equilibrium, rates, the Boltzmann distribution and enthalpy are developed beyond the simple understanding from GCSE. This will lead onto more difficult mathematical ideas related to physical chemistry, such as entropy, Gibbs free energy and equilibrium constants.					
	Autumn 1	**Autumn 2**	**Spring 1**	**Spring 2**	**Summer 1**	**Summer 2**
Key ideas	**Module 2** • Atomic structure • Amount of substance • Structure and bonding • Shapes of molecules • Intermolecular forces	**Module 2** • Neutralisation reactions and titration • Redox • Periodic trends and patterns **Module 4** • Basic organic nomenclature	**Module 3** • Group 2 & group 7 • Qualitative analysis • Enthalpy changes **Module 4** • Curly arrow mechanisms • Alkanes, alkenes, halogenoalkanes	**Module 3** • Hess' Law • Rates and the Boltzmann distribution • Dynamic equilibrium and Le Chatelier's principle **Module 4** • Nucleophilic substitution • Alcohols • IR and Mass Spec	• Exam preparation and revision • PPEs **Module 5** • Enthalpy **Module 6** • Benzene and aromatic compounds	• Born-Haber cycles • Enthalpy of hydration • Nitration of benzene
Sequence of Learning (taught by *2* teachers)	**Module 2** • Atomic structure, isotopes and formula mass • Electron configurations, spdf notation • The mole and reacting masses, gas volumes and concentration	**Module 2** • Strong and weak acids • Neutralisation • Acid-base titrations • Shapes of molecules and ions, electron pair repulsion theory	**Module 3** • Group 2 and group 7 trends. Reactivity and reactivity of group 2 compounds • Qualitative analysis **Module 4** • Isomerism and stereoisomerism	**Module 3** • Enthalpy change of combustion and formation • Hess' law and enthalpy cycles • Enthalpy change of neutralisations • Rates and collision theory, the	Examination preparation • PPE DIRT **Module 5** • Equilibrium constant and calculations	PAG catch-up and round up • Born-Haber cycles and lattice enthalpyc • Enthalpy of hydration

	• % yield and atom economy • Ionic and covalent bonding, properties of ionic and covalent materials	• Electronegativity, bond polarity, intermolecular forces including hydrogen bonding • Metallic and giant covalent structures • Periodicity and explaining trends in ionisation energy and melting point • Oxidation numbers and redox reactions **Module 4** • Basic organic nomenclature, structural formula, displayed formula, skeletal formula	• Alkanes and reactions of alkanes. Combustion and free-radical substitution • Alkenes and reactions of alkenes. Curly arrow mechanism for electrophilic addition • Halogenoalkanes and the hydrolysis of halogenoalkanes	Boltzmann distribution • Dynamic equilibrium and Le Chatelier's principle **Module 4** • Nucleophilic substitution of halogenoalkanes • Alcohols; classification and properties • Oxidation reactions of alcohols using reflux and distillation • Analytical techniques; IR and Mass Spectrometry	**Module 6** • Benzene structure and aromatic compounds	**Module 6** • Electrophilic substitution of benzene • Nitration of benzene
Vocabulary	The list of key words is too numerous for inclusion here. The recommended course textbook provides a complete Glossary of key words					
Practical Skills	PAG TASKS: 1.1 – Determination of the composition of copper (II) carbonate 1.2 – Determination of the relative atomic mass of magnesium 1.3 – Determination of the formula of magnesium oxide	PAG TASKS: 2.1 – Determination of the concentration of hydrochloric acid 2.2 – Determination of the molar mass of an acid 2.3 – Identification of an unknown carbonate	PAG TASKS: 4.1 – Identifying unknowns 3.1 – Determination of the enthalpy change of neutralisation	PAG TASKS: 3.3 – Determination of an enthalpy change of combustion 3.2- Hess's Law 5.1 – Synthesis of a halogenoalkane 5.3 – Oxidation of ethanol	PAG TASKS: 5.2 – Preparation of cyclohexene	6.3 – Nitration of methyl benzoate