Chemistry A Level Curriculum Plan							
Unit	Core		Hinterland		Specification Points	Assessment	Whole Education Opportunities
	Knowledge	Skills	Knowledge	Skills			
Module 1 Development of Practical Skills in Chemistry	• Planning • Implementation • Analysis • Evaluation • Independent thinking • Use and application of scientific methods and practices • Research and referencing • Use of apparatus and techniques	• apply investigative approaches and methods to practical work • safely and correctly use a range of practical equipment and materials • follow written instructions • make and record observations/measurements HSW8 • keep appropriate records of experimental activities • present information and data in a scientific way • use appropriate software and tools to process data, carry out research and report findings • use online and offline research skills including websites, textbooks and other printed scientific sources of information • correctly cite sources of information	• .Be able to plan, implement, analyse and evaluate required practical procedures from unfamiliar experiments	• Correct use of research and referencing skills.	1.1.1 1.1.2 1.1.3 1.1.4 1.2.1 1.2.2	• Completion of practical reports	• Biology and Physics – linked to required practical techniques
Module 2 Foundations in Chemistry	• atomic structure • quantitative chemistry: formulae, equations, amount of substance and the mole • reactions of acids • oxidation number and redox reactions • bonding and structure	• writing chemical formulae • constructing equations • calculating chemical quantities using the concept of amount of substance • The role of acids, bases and salts in chemistry is developed in the context of neutralisation reactions. • redox reactions are studied within the context of oxidation number and electron transfer.	• Use of unfamiliar titration experiments • How to use oxidation equations in an unfamiliar situation. • Intermolecular forces	• structured and non-structured titration calculations, based on experimental results of familiar and non-familiar acids and bases. • interpretation of redox equations and unfamiliar redox reactions, to make predictions in terms of oxidation numbers and electron loss/ gain. • explanation of the effect of structure and bonding on the physical properties of covalent compounds with simple molecular lattice structures including melting and boiling points, solubility and electrical conductivity.	2.1.1 2.1.2 2.1.3 2.1.4 2.1.5 2.2.1 2.2.2	• PLC/End of topic assessment • PR points use mixed topic assessments	• Maths – calculations and re-arranging formulae • Biology – Biochemistry and links to biological molecules • Chemical Industry – practical techniques in experimental work. • History – how the structure of the atom has changed over time.
Module 3 Periodic Table and Energy	• 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.	• qualitative practical skills, especially observational skills required for analysis, and accurate quantitative techniques involved in determination of energy changes and reaction rates • mathematical skills when studying enthalpy changes and reaction rates and when carrying out quantitative practical work.	• The extension of the periodic table through discovery and confirmation of new elements. • Balancing the effects of equilibrium, rate, safety and economics to determine the conditions used in industrial reactions e.g. Haber process.	• Interpretation of trends and patterns to identify new elements • Investigating new reversible reactions and interpreting ideal conditions for reactions • explanation of the importance to the chemical industry of a compromise between chemical equilibrium and reaction rate in deciding the operational conditions	3.1.1 3.1.2 3.1.3 3.1.4 3.2.1 3.2.2 3.2.3	• PLC/End of topic assessment • PR points use mixed topic assessments7 • Synoptic Assessment	• Maths – calculations and re-arranging formulae • Biology – Biochemistry and links to biological molecules • Chemical Industry – practical techniques in experimental work and theoretical conditions for maximum yields.
Module 4 Core Organic Chemistry	• nomenclature and formula representation, functional groups, organic reactions and isomerism • aliphatic hydrocarbons • alcohols and haloalkanes • organic practical skills and organic synthesis	• types of structures used routinely in organic chemistry, nomenclature, and the important concepts of homologous series. • functional groups, isomerism and reaction mechanisms using curly arrows. • hydrocarbons: alkanes and alkenes.	• Knowledge of different analytical techniques • Knowledge of organic synthesis	• Being able to interpret data and identify unknown organic molecules • to be able to devise two stage synthetic routes by applying transformations between all functional groups encountered up to this point of the specification.	4.1.1 4.1.2 4.1.3 4.2.1 4.2.2 4.2.3 4.2.4	• PLC/End of topic assessment PR points use mixed topic assessments Synoptic assessment of: • Atoms, moles and stoichiometry • Acid and redox reactions Bonding and structure	• Chemical Industry – practical techniques in experimental work • PHSE/Geography - reducing demand for hydrocarbon fuels, processing plastic waste productively, and preventing use of ozone-depleting chemicals.

	• instrumental analytical techniques to provide evidence of structural features in molecules.						• PHSE – use and disposal of polymers
Module 5 Physical Chemistry and Transition Elements	• rate equations, orders of reaction, the rate determining step • equilibrium constants, Kc and Kp • acid–base equilibria including pH, Ka and buffer solutions • lattice enthalpy and Born–Haber cycles • entropy and free energy • electrochemical cells. • redox chemistry • transition elements.	• Rates within a quantitative and graphical context. • quantitative techniques involved in the determination of reaction rates and pH • Bronsted – Lowry acids and bases • Calculations of energy changes • Periodic Table within the context of the transition elements	• the Arrhenius equation: (i) the exponential relationship between the rate constant, k and temperature, T given by the Arrhenius equation, k = Ae–Ea/RT (ii) determination of Ea and A graphically using: ln k = –Ea/RT + ln A derived from the Arrhenius equation. • Use of entropy, enthalpy and temperature for predicting feasibility.	• Application of the Arrhenius equation using unfamiliar reactions Using data to predict feasibility of reactions and give energy changes	5.1.1 5.1.2 5.1.3 5.2.1 5.2.2 5.2.3 5.3.1 5.3.2	• PLC/End of topic assessment • PR points use mixed topic assessments • Synoptic assessment of: • Atoms, moles and stoichiometry • Acid and redox reactions • Bonding and structure • Periodicity, Group 2 and the halogens • Enthalpy changes • Reaction rates • Chemical equilibrium	• Maths – calculations and re-arranging formulae • Biology – Biochemistry and links to biological molecules • Chemical Industry – practical techniques in experimental work •
Module 6 Organic Chemistry and Analysis	• aromatic compounds • carboxylic acids and esters • 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.	• Aromatic compounds including the central role of delocalisation within the chemistry of arenes and phenols. • Directing groups including their importance to organic synthesis. • carbonyl compounds, aldehydes and ketones • carboxylic acids and their related functional groups, acyl chlorides and esters • the techniques and procedures used for the preparation and purification of organic solids involving use of a range of techniques	• .the prediction of substitution products of aromatic compounds by directing effects and the importance to organic synthesis • analysis of a high resolution proton NMR spectrum of an organic molecule to make predictions about unknown molecule identity	• Being able to use knowledge of synthetic routes to explain which products are formed during synthesis. • Using spectral data to identify know compounds from organic synthesis	6.1.2 6.1.2 6.1.3 6.2.1 6.2.2 6.2.3 6.2.4 6.2.5 6.3.1 6.3.2	• PLC/End of topic assessment • PR points use mixed topic assessments • Synoptic assessment of: • Atoms, moles and stoichiometry • Acid and redox reactions • Bonding and structure • Organic nomenclature and structures • Hydrocarbons • Alcohols and haloalkanes • Synthesis and analysis	• Chemical Industry – practical techniques in experimental work • Maths - % yield calculations • Biology – importance of biochemical molecules and pharmaceutical industry • Physics – use of analytical techniques • PHSE – Disposal of waste compounds and effect on environment