

Curriculum Map Year 12 Chemistry

Topic Name	Term	Skills developed with link to NC Subject content	Reflection on previous link in the curriculum	Progress to future link in the curriculum
Atomic Structure	<i>Autumn HT1</i>	<ul style="list-style-type: none"> ● Fundamental Particles ● Mass Numbers and Isotopes ● TOF Mass Spectrometry ● Electronic Configuration ● First and Second Ionisation Energy 	GCSE AQA 4.1.1 A simple model of the atom, symbols, relative atomic mass, electronic charge and isotopes 4.1.1.7 Electronic structure	The taught content does not get any more complex than this. However, there is a difference in the level of challenge from AS level to A level examination questions. It is therefore aptitude for answering questions rather than subject knowledge that has the opportunity to develop in this topic in year 13.
Organic Nomenclature, Alkanes, Halogenoalkanes	<i>Autumn HT1</i>	<ul style="list-style-type: none"> ● Nomenclature ● Representing organic compounds: <ul style="list-style-type: none"> ○ empirical formula ○ general formula ○ structural formula ○ skeletal formula ○ displayed formula ○ molecular formula ● Isomerism ● Fractional distillation of crude oil ● Cracking ● Combustion of Alkanes ● Chlorination of Alkanes ● Nucleophilic substitution ● Elimination ● Ozone depletion 	GCSE AQA 4.7.1.1 Crude oil, hydrocarbons and alkanes 4.7.1.2 Fractional distillation and petrochemicals 4.7.1.3 Properties of hydrocarbons 4.7.1.4 Cracking and alkenes	A Level AQA 3.3.10 Aromatic Chemistry 3.3.12 Polymers 3.3.11 Amines 3.3.9 Carboxylic acids and derivatives 3.3.14 Organic Synthesis
Amount of Substance	<i>Autumn HT2</i>	<ul style="list-style-type: none"> ● Relative atomic mass and Relative molecular mass ● The mole and Avogadro constant ● Ideal Gas Equation ● Empirical and molecular formula ● Balanced Equations and associated Calculations: <ul style="list-style-type: none"> ○ Percentage Atom Economy ○ Calculating mass ○ Calculating volume of gases ○ calculating concentration and volume of solutions 	GCSE AQA 4.3.1 Chemical measurements, conservation of mass and the quantitative interpretation of chemical equations 4.3.2 Use of amount of substance in relation to masses of pure substances 4.3.3 Yield and atom economy of chemical reactions (chemistry only) 4.3.4 Using concentrations of solutions in mol/dm ³ (chemistry only) 4.3.5 Use of amount of substance in relation to volumes of gases	A Level AQA 3.2.5.5 Variable oxidation states and Redox Titration Calculations 3.1.12 Acids and Bases
Alkenes and Alcohols and organic Analysis	<i>Autumn HT2</i>	<ul style="list-style-type: none"> ● Structure, bonding and reactivity of alkenes ● Addition reactions to alkenes ● Addition polymers ● Alcohol production and classification ● Oxidation of alcohols ● Elimination of an alcohol 	GCSE AQA 4.7.1.4 Cracking and alkenes 4.7.2 Reactions of alkenes and alcohols (chemistry only) 4.7.2.3 Alcohols 4.7.2.4 Carboxylic acids	A Level AQA 3.3.10 Aromatic Chemistry 3.3.12 Polymers 3.3.11 Amines 3.3.9 Carboxylic acids and derivatives 3.3.14 Organic Synthesis

Bonding	<i>Spring HT3</i>	<ul style="list-style-type: none"> ● Ionic bonding ● The nature of covalent and dative bonding ● Metallic bonding ● Bonding and physical properties: <ul style="list-style-type: none"> ○ Ionic ○ Metallic ○ Macromolecular ○ Molecular ● Shapes of simple molecules and ions ● Bond Polarity and Intermolecular forces 	GCSE AQA 4.2 Bonding, structure, and the properties of matter 4.2.1 Chemical bonds, ionic, covalent and metallic 4.2.2 How bonding and structure are related to the properties of substances 4.2.3 Structure and bonding of carbon	A Level AQA 3.1.8.1 Born Haber Cycles 3.2.5.3 Shapes of Complex Ions 3.2.5.1 General properties of transition metals (complex formation)
Periodicity, Group 2 and Group 7 and Redox	<i>Spring HT3</i>	<ul style="list-style-type: none"> ● Classification of an element based on its position in the periodic table ● Physical properties of period 3 elements <ul style="list-style-type: none"> ○ Atomic radii ○ First and second ionisation energy ○ Melting point ● Explain physical properties of group 2 elements ● The reactions of the elements Mg–Ba with water. ● Uses, reactions and solubility of group 2 elements and compounds ● Trends in properties of halogens and halide ions ● Uses of chlorate ions and chlorine 	GCSE AQA 4.4.1.4 Oxidation and reduction in terms of electrons (HT only) 4.1.2.5 Group 1 4.1.2.6 Group 7	A Level AQA 3.2.4 Properties of Period 3 elements and their oxides (A-level only) 3.2.5 Transition metals
Energetics	<i>Spring HT4</i>	<ul style="list-style-type: none"> ● Enthalpy Change ● Calorimetry ● Applications of Hess's Law ● Bond Enthalpies 	GCSE AQA 4.5 Energy changes 4.5.1 Exothermic and endothermic reactions 4.5.1.2 Reaction profiles 4.5.1.3 The energy change of reactions (HT only)	A Level AQA 3.1.8 Thermodynamics
Chemical Analysis	<i>Spring HT4</i>	<ul style="list-style-type: none"> ● Test tube Reactions to identify functional group ● Infrared spectroscopy ● Mass Spectroscopy ● Chromatography ● Introduce NMR 	GCSE AQA 4.8 Chemical analysis 4.8.1 Purity, formulations and chromatography 4.8.2 Identification of common gases 4.8.3 Identification of ions by chemical and spectroscopic means (chemistry only) 4.8.3.6 Instrumental methods 4.8.3.7 Flame emission spectroscopy	A Level 3.3.15 Nuclear magnetic resonance spectroscopy <ul style="list-style-type: none"> ● ¹H ● ¹³C 3.3.16 Chromatography TOF calculations using the equation for Kinetic Energy
Kinetics and Equilibria	<i>Summer HT5</i>	<ul style="list-style-type: none"> ● Collision Theory ● Maxwell - Boltzmann distribution ● Effect of temperature on reaction rate ● Effect of concentration and pressure ● Catalysts ● Chemical Equilibria and Le Chatelier's principle ● K_c for homogeneous systems 	GCSE AQA 4.6.1 Rate of reaction 4.6.1.1 Calculating rates of reactions 4.6.1.2 Factors which affect the rates of chemical reactions 4.6.1.3 Collision theory and activation energy 4.6.1.4 Catalysts 4.6.2 Reversible reactions and dynamic equilibrium	A Level AQA 3.1.9 Rate Equations 3.2.6 Reactions of aqueous ions in solution

Optical Isomerism and Reactions of Aldehydes and Ketones	<i>Summer HT5</i>	<ul style="list-style-type: none"> ● Optical isomers and optical activity ● Optically active drugs ● Reactions of aldehydes and ketones to form alcohols and hydroxynitriles via nucleophilic addition <ul style="list-style-type: none"> ○ Equations ○ Mechanisms <p>Optical activity in the products of nucleophilic substitution or the lack of.</p>	GCSE AQA 4.7.2.3 Alcohols 4.4.1.4 Oxidation and reduction in terms of electrons (HT only)	A Level AQA 3.3.10 Aromatic Chemistry 3.3.12 Polymers 3.3.11 Amines 3.3.9 Carboxylic acids and derivatives 3.3.14 Organic Synthesis
Preparation for End of Year Exams	<i>Summer HT6</i>	Covers all of the above topics and a range of different skills using past exam questions in order to improve exam technique	Building on GCSE assessment technique https://www.aqa.org.uk/subjects/science/gcse/chemistry-8462/assessment-resources	Progression from AS Level demand past paper questions to A Level demand past paper questions
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