Chemistry New Spec Run Through (v2022/2023)

1. Atomic Structure and the Periodic Table, 2. Bonding, Structure and the Properties of Matter 3. Quantitative Chemistry 4. Chemical Changes 5. Energy Changes 6. The rate and extent of chemical change 7. Organic Chemistry 8. Chemical Analysis 9. Chemistry of the Atmosphere 10. Using Resources.

Year 10	Year 11
C1.1.1 Atoms, elements and compounds C1.1.2 Mixtures C1.1.4 Relative electrical charges of subatomic particles C1.1.5 Size and mass of atoms C1.1.6 Relative Atomic Mass C1.1.7 Electronic Structure C1.1.3 The Development of the model of the atom C1.2.1 Periodic Table C1.2.2 Development of the Periodic Table C1.2.3 Metals and Non-Metals C1.2.4 Group 0 C1.2.5 Group 1 C1.2.6 Group 7 ***C1.3.1 Transition metals - Comparison with Group 1 Elements*** ***C1.3.2 Transition metals – Typical Properties*** C3.1.1 Conservation of mass and balanced chemical equations C1.1.6 Relative Atomic Mass (recap calculations) C3.1.2 Relative Formula Mass C3.1.3 Mass Changes when a reactant of product is a gas C3.1.4 Chemical measurements C3.2.5 Concentration of Solutions	C2.1.1 Chemical Bonds C2.1.2 Ionic Bonding C2.1.3 Ionic Compounds C2.2.3 Properties of Ionic Compounds C2.1.4 Covalent Bonding C2.2.6 Giant Covalent Structures C2.3.1 Diamond C2.3.2 Graphite C2.3.3 Graphene and Fullerenes C2.1.5 Metallic Bonding C2.2.7 Properties of metals and alloys C2.2.8 Metals as conductors C2.2.1 The three states of matter C2.2.4 Properties of small molecules C2.2.5 Polymers ***C2.4.1 Sizes of particles and their properties*** ***C2.4.2 Uses of nanoparticles*** ***C10.3.2 Alloys as useful materials*** ***C10.3.3 Ceramics, polymers and composites***
C8.1.1 Chemical Analysis – Pure Substances C8.1.2 Formulations C8.1.3 Chromatography ***(Required Practical 6 – Investigate how paper chromatography can be used to separate and tell the difference between coloured substances. Students should calculate Rf values))*** C8.2.1 Identification of common Gases – Hydrogen C8.2.2 Identification of common Gases – Oxygen C8.2.3 Identification of common Gases – Carbon Dioxide C8.2.4 Identification of common Gases – Chlorine ***(Required Practical 7 – Chemical Tests for 8.3.1 – 8.3.5 - Chemistry Only)*** ***C8.3.1 Chemical Analysis – Flame Tests*** ***C8.3.2 Chemical Analysis – Metal Hydroxides*** ***C8.3.3 Chemical Analysis – Carbonates*** ***C8.3.4 Chemical Analysis – Halides*** ***C8.3.5 Chemical Analysis – Sulfates*** ***C8.3.6 Chemical Analysis – Instrumental Methods*** ***C8.3.7 Chemical Analysis – Flame emission Spectroscopy*** C9.1.1 Composition and evolution of the atmosphere – proportions of gases in the atmosphere C9.1.2 The Earth's early atmosphere C9.1.3 How Oxygen increased C9.1.4 How Carbon Dioxide decreased C9.2.1 Carbon Dioxide and Methane as greenhouse gases – Greenhouse gases C9.2.2 Human activities which contribute to an increase in greenhouse gases C9.2.3 Global Climate Change C9.2.4 The Carbon footprint and its reduction C9.3.1 Atmospheric pollutants from fuels C9.3.2 Properties and effects of atmospheric pollutants C10.1.1 Using the Earth's resources and sustainable development C10.1.2 Potable Water ***(Required Practical 8 – Analysis and purification of water samples from different sources, including pH, dissolved solids and distillation)*** C10.1.3 Waste water treatment C10.2.1 Life cycle assessment C10.2.2 Ways of reducing the use of resources	C2.2.2 State Symbols C4.2.1 Reactions of acids with metals C4.2.2 Neutralisation of acids and salt production C4.2.3 Soluble Salts ***(Required Practical 1 - Preparation of a pure, dry sample of a soluble salt from an insoluble oxide or carbonate using a Bunsen burner to heat dilute acid and a water bath or electric heater to evaporate the solution)*** C4.2.4 The pH scale and neutralisation ***(Required Practical 2 – determination of the reacting volumes of solutions of a strong acid and a strong alkali by titration – Chemistry only)*** C4.2.6 Strong and Weak Acids (HT) ***C4.2.5 Titrations*** ***C10.4.2 Production and uses of NPK fertilisers*** C4.3.1 The process of electrolysis C4.3.2 Electrolysis of molten ionic compounds C4.3.3 Using electrolysis to extract metals C4.3.4 Electrolysis of aqueous solutions ***(Required Practical 3 – Electrolysis. Investigate what happens when the aqueous solutions are electrolysed using inert electrodes. This should include developing a hypothesis).)*** C4.3.5 Representation of reactions at electrodes as half equations (HT) ***C5.2.1 Chemical Cells - Cells and Batteries*** ***C5.2.2 Chemical Cells – Fuel Cells***
C4.1.1 Reactivity of Metals – Metal Oxides C4.1.2 Reactivity Series C4.1.3 Extraction of metals and Reduction C4.1.4 Oxidation and reduction in terms of electrons (HT) C10.1.4 Alternative methods of extracting metals (HT) ***C10.3.1 Using materials – Corrosion and its prevention***	C7.1.1 Crude Oil, Hydrocarbons and Alkanes C7.1.2 Fractional Distillation and Petrochemicals C7.1.3 Properties of hydrocarbons C7.1.4 Cracking and Alkenes ***C7.2.1 Structure and formulae of Alkenes*** ***C7.2.2 Reactions of Alkenes*** ***C7.3.1 Synthetic and Naturally Occurring Polymers - Addition Polymerisation*** ***C7.3.2 Condensation Polymerisation (HT)*** ***C7.3.3 Amino Acids (HT)*** ***C7.3.4 DNA and other naturally occurring polymers*** ***C7.2.3 Alcohols*** ***C7.2.4 Carboxylic Acids***
C5.1.1 Energy transfer during exothermic and endothermic reactions ***(Required Practical 4 – Investigate the variables that affect temperature changes in reacting solutions such as, eg acid plus metals, acid plus carbonates, neutralisations, displacement of metals)*** C5.1.2 Reaction profiles C5.1.3 Energy change of reactions (HT) C6.1.1 Rate of Reaction – Calculating rates of reaction C6.1.2 Factors which affect the rates of chemical reactions ***(Required Practical 5 – Investigate how changes in Concentration and Rate of Reaction – involve measuring the amount of gas produced AND a method involving a change in colour or turbidity))*** C6.1.3 Collision theory and activation energy C6.1.4 Catalysts C6.2.1 Reversible Reactions C6.2.2 Energy changes and reversible reactions C6.2.3 Equilibrium ***C10.4.1 Haber Process (aspects HT)*** C6.2.4 The effect of changing conditions on equilibrium (HT) C6.2.5 The effect of changing concentration (HT) C6.2.6 The effect of temperature changes on equilibrium (HT) C6.2.7 The effect of pressure changes on equilibrium (HT)	C3.2.1 Uses of amount of substance in relation to masses of pure substances - Moles (HT) C3.2.2 Amounts of substances in equations (HT) C3.2.3 Using moles to balance equations (HT) C3.2.4 Limiting Reactants (HT) C3.2.5 Concentration of Solutions ***C3.3.1 Yield and atom economy of chemical reactions – Percentage Yield*** ***C3.3.2 Atom economy*** ***C3.4 Using concentration of solutions in mol/dm3 (HT)*** ***C3.5 Use of amount of substance in relation to volume of gases (HT)***