Triple Science: Chemistry

Key Stage 4: Year 10

Overall Curriculum Goals - developing the following Big Ideas:

- **Structure determines properties**
- **Reactions rearrange matter**
- **Earth systems interact**

Term 1

WC 06/09 & 13/09	WC 20/09 & 27/09	WC 04/10 & 11/10 & 18/10	WC 01/11 & 08/11	WC 15/11 & 22/11	WC 29/11 & 6/12 & 13/12
Review CC3 & 4 Ionic bonding CC5, 6 & 7 • Ions • Ionic bonding • Ionic compounds • Ionic lattices	• Covalent bonds • Simple covalent molecules • Giant covalent molecules • Metallic bonding • Bonding models	Assessment CC5-7 Close the Gap Calculations involving masses CC9 • Calculating concentration • Conservation of mass • Relative formula mass • Empirical formula	• Empirical formula Suggested practical – calculating the empirical formula of magnesium oxide • Moles • Stoichiometry Assessment CC9 Close the Gap	States of matter CC1&2 • States of matter • Mixtures • Filtration and crystallisation • Distillation • Paper chromatography	• Core practical – investigating inks (method, conclusion • Drinking water Close the Gap Assessment CC1&2

Key Vocabulary/Concepts/ideas

Half Term 1 Bonds, ions, cations, anions, electrons, electrostatic forces, ionic compounds, lattice structure, properties, melting point, boiling, anode, cathode, covalent, molecular., valency, polymer, monomer, intermolecular, allotropes, fullerenes, graphene, delocalised, metallic, malleable, conduct

Half Term 2 Bonding, ionic, simple molecular, giant covalent, metallic, empirical formula, molecular formula, relative formula mass, conservation of mass, Avogadro constant,

Term 2

WC 3/01 & 10/01	WC 17/01 & 24/01	WC 31/01 & 07/02 & 14/02	WC 28/02 & 07/03	WC 14/03 & 21/03	WC 28/03 & 04/04
Acids and Alkalis CC8 •Indicators • Acids • Bases and salts • Alkalis and balancing equations • Reactions of acids with metals and carbonates	• Alkalis and neutralisation • Core practical – investigating neutralisation (method, risk assessment, equations) • Solubility • Core practical – preparing copper sulfate (method, risk assessment, conclusion)	Assessment CC8 Close the Gap • Transition metals • Reactivity series • Extraction by reduction • Electrolysis	• Electrolysis • Products of electrolysis • Half equations. • Core practical – electrolysis of copper sulfate (method, conclusion)	• Core practical – electrolysis of copper sulfate (method, conclusion) • Life cycle assessment & recycling • Alloys • Corrosion and protection Assessment CC10, 11 & 12 Close the Gap	Separate Chemistry 1 • Calculating concentration • Core Practical – Titrations • Fertilisers

Key Vocabulary/Concepts/ideas

Half Term 3 Particle model, solid, liquid, gas, physical, chemical, melting, insoluble, filtration, cystallisation, solution, solute, solvent, filtrate, residue, risk assessment, hazard, chromatography, stationary phase, mobile phase, chromatogram

Half Term 4 Distillation, mixture, evaporates, condensed, fractional distillation, precipitates, aquifers, sedimentation, chlorination,

Term 3

WC 25/04 & 02/05	WC 09/05 & 16/05	WC 23/05	WC 06/06 & 13/06	WC 20/06 & 27/06	04/07 & 11/07
• Industrial calculations • Molar volumes of gases Assessment Separate Chemistry 1 Close the Gap	MOCK EXAMINATIONS Review Chemistry paper 1	Review Chemistry paper 1	Groups in the periodic table CC13,14 & 15 • Group 1 • Group 7 • Halogen reactivity • Group 0 • Rates of reaction	• Factors affecting reaction rates • Core practical – investigating reaction rates (method, calculations, conclusion) • Catalysts and activation energy	• Exothermic and endothermic reactions • Dynamic equilibria Assessment CC13, 14 & 15 Close the Gap

Key Vocabulary/Concepts/ideas

Half Term 5 Aqueous solution, acidic, alkaline, neutral, pH scale, polyatomic ions, dissociate, neutralise,, state symbols, crystallization, Ions, neutralisation,,titration, burette, pipette, end-point, reactivity series, effervescence, ionic equation, carbonates, precipitation, precipitate, insoluble

Half Term 6 Electrolysis, electrolyte, electrodes, cations, anions, cathode, anode, oxidation, reduction, half equation, displacement, redox, native state, extraction, bioleaching, leachate, phytoextraction, corrosion, recycling

CEIAG

- Cultural capital sheets to introduce each unit.
- Careers displays around the whole department
- British Science week
- Why Study? Talks

Personal Development

Throughout the year the rule of law is promoted during experimental work, students are required to follow lab rules in order to keep themselves and each other safe. This also allows us to focus upon tolerance and respect whilst collaborating with others. When discussing theories and development of ideas students are encouraged to respect the views of others.

Key Stage 4: Year 11

Overall Curriculum Goals - developing the following Big Ideas:

- **Structure determines properties**
- **Reactions rearrange matter**
- **Earth systems interact**

Term 1

WC 06/09 & 13/09	WC 20/09 & 27/09	WC 04/10 & 11/10 & 18/10	WC 01/11 & 08/11	WC 15/11 & 22/11	WC 29/11 & 06/12 & 13/12
Review CC10, 11 &12 and Separate Chemistry 1	Fuels CC16 • Hydrocarbons in crude oil and natural gas • Homologous series • Alcohols	• Carboxylic acids • Addition polymerisation • Condensation polymeristaion	• Fractional distillation of crude oil • Complete and incomplete combustion • Combustible fuels and pollution	• Breaking down hydrocarbons • Fuel cells • Core Practical: Investigate the temperature rise produced in a known mass of water by the combustion of alcohols.	• Evolution of the atmosphere • Climate change Assessment CC16&17 • Close the Gap

Key Vocabulary/Concepts/ideas

Half Term 1 **catalyst, haber process, alloy, redox, rusting, electroplating, titration, concentration, moles, yield, actual yield, theoretical yield, impurities, atom economy, raw material, industrial process, equilibrium, fertilisers, composition, molar volume.**

Half Term 2 Periodic table, alkali metals, reactivity, halogens, diatomic, salts, halide, displacement, redox, oxidation, reduction, noble gases, inert, rate of reaction, activation energy, exothermic, endothermic, catalysts, protein, active site, denature, neutralization, displacement

Term 2

WC 03/01 & 10/01	WC 17/01 & 24/01	WC 31/01 & 07/02 & 14/02	WC 28/02 & 07/03	WC 14/03 & 21/03	WC 28/03 & 04/04
Separate Chemistry 2 • Tests for cations • Tests for anions • Flame photometry Core Practical: Identifying Ions	• Materials and their uses Assessment Separate Chemistry 2 • Close the Gap	Review Chemistry Paper 1	Review Chemistry Paper 1	Review Chemistry Paper 2	Review Chemistry Paper 2

Key Vocabulary/Concepts/ideas

Half Term 3 Crude oil, natural gas, hydrocarbons, fractional distillation, evaporate, condense, viscosity, ignite, alkanes, homologous, molecular formulae, structural formulae, combustion, complete, incomplete, alcohols, carboxylic acids, addition polymerisation, condensation polymerisation, fermentation

Half Term 4 cation, insoluble, precipitate, ammonia, irritant, toxic, nichrome, anion, blue litmus paper, line spectrum, photometry, instrumental analysis, nanoparticles, nanometres, polymers, ceramics, metals, composites, clay, glass, tensile

Term 3

WC 25/04	WC 02/05	WC 09/05	WC 16/05	WC 23/05	WC 06/06	WC 13/06	WC 20/06	WC 27/06	WC 04/07	WC 11/07	WC 18/07
Revision GCSE Exams											

Key Vocabulary/Concepts/ideas

Half Term 5

Half Term 6

CEIAG

- Cultural capital sheets to introduce each unit.
- Careers displays around the whole department
- British Science week
- Why Study? Talks

Personal Development

Throughout the year the rule of law is promoted during experimental work, students are required to follow lab rules in order to keep themselves and each other safe. This also allows us to focus upon tolerance and respect whilst collaborating with others. When discussing theories and development of ideas students are encouraged to respect the views of others. Students are taught the importance of making informed choices when discussing types of energy and their effects.