

Chemistry Learning Journey

Skills

Year 11 "Becoming KS5 Ready"

Knowledge

C10 - Earth's Resources

Sustainable development, drinking water, corrosion, phytomining, alloys, the Haber process, ceramics, fertilisers.

Future Education, Employment & Training

> KS5 Study

C9 - Chemistry of the Atmosphere

Composition of air, earths early atmosphere, carbon footprint, pollutants, global warming, climate change.

C8 - Chemical Analysis

Purity, formulations, chromatography, gas tests, flame tests, ion tests.

Year 10 "Developing into Independent Learners"

C6 – Rates & Equilibria

Factors affecting rate of reaction, collision theory, investigating rate of reaction, catalysts. Le Chatelier, Dynamic Equilibrium

Year 11

C7 – Organic Chemistry

Crude oil, fractional distillation, cracking, alkenes, carboxylic acids,

C5 – Energy Changes

Endothermic, temperature changes practical, exothermic, reaction profile diagrams, bond energies batteries, fuel cells.

C4 – Chemical Changes

Displacement reactions, extraction of copper, pH, acids, alkalis and indicators, making a salt, bases and salts, electrolysis, products of electrolysis.

Year 9 "Developing Skills to Enhance Learning"

C3.1 - Extending the Mole

Calculating concentrations, empirical formulae, titration, atom economy, percentage yield, gas volumes.



C3.1 – Introducing the Mole

Conservation of mass, calculating moles, calculations using masses, Avogadro's constant

C2 – Bonding and Structure

States of matter, ionic bonding, ionic lattices, ionic compounds, covalent bonds, simple molecules, allotropes o carbon, polymers, metallic bonding, nanotechnology.

C1 - Atomic Structure & the Periodic Table

Chromatography, elements, distillation, atomic number and isotopes, electron configuration, history of the atom relative atomic mass group 1 group 7 the modern periodic table, transition metals

Year 8 "Taking Responsibility for Learning"

The Earth

Atmosphere, the carbon cycle, climate change, extracting metals, recycling



Chemical Reactions – Metals, Non-Metals & Chemical Energy

Metals & acids, metals & oxygen, metals & water, metal displacement, energy profiles, endothermic and exothermic reactions, bond energies, catalysts.

Year 7 "Transition to High School"

Earth

Earth structure, rock types, rock cycles, weathering.



Matter – Periodic Table & Types of Reaction

Groups and periods, the atom, metals and non-metals, Group 0 - the noble gasses, Group 1 - alkali metals, Group 7 - the halogens, conservation of mass, themal decomposition, combustion, equations.

Chemical Reactions - Elements, Acids & Alkalis

Compounds, elements, neutralisation, acids and alkalis, making salts, indicators and pH.



Intro to Science

Fundamental skills, graph plotting.

Matter - Particles & Separating Mixtures

States of matter, the particle model, melting & freezing, chromatography, diffusion, gas pressure.



Chemistry GH6 Learning Journey

Skills

Year 13 "Are you Fit for FEET?"

Year 12

Mindset"

"Introduction to A-Level

Knowledge

Organic Synthesis

Preparation of organic solids functional groups, multister synthesis

Analysis

Carbon NMR, deuterated water proton NMR, TLC, GC-MS

Final A-Level Exams

Future Education, Employment & Training

Nitrogen Chem & Polymers

Amines, aromatic amines, polyamides, polyesters, hydrolysis.

Carboxylic Acids, Esters

Esterification, acid reactions hydrolysis, acyl chlorides.

Carbonyls

Reduction, nucleophilic addition, carbonyl tests hydroxy nitriles, Tollen's

Organic Chemistry & Analysis

Aromatic Chemistry

Benzene, delocalised model, nitration, substitution, phenol, directing groups.

Transition Elements

Electron configuration, complex ions stereochemistry, colours, ligand substitution, qualitative testing.

Redox, Electrode Potentials

Redox titration, constructing redox equations, standard hydrogen electrode,

Rates

Orders, rate-concentration graphs rate equations, rate determining step, Arrhenius equations.

Enthalpy, Entropy

Lattice enthalpy, charge density, Born Haber cycles, enthalpy change of solution, feasibility, entropy change, free energy change.

Equilibrium

Calculating Kc, factors that affect Kc, equilibria experiments, Kp.

Acids, Bases, Buffers

pH, acids, bases, pH of wea acids, Kw, buffer calculations indicators.

Physical Chemistry & Transition Elements

Organic Synthesis & Analytical Techniques

Purification of Organic Liquid, separation and extraction, infrared spectroscopy, multistep synthesis, elemental analysis, mass spectrometry

Year 13

Hydrocarbons

Alkanes, radical substitution, combustion, alkenes, addition polymers, electrophilic addition

Alcohols & Haloalkanes

Types of alcohols, oxidation, reflux, solubility, nucleophilic substitution, ozone layer, rates of hydrolysis, organic synthesis.

Basic Concepts

Skeletal formulae, functional groups, homologous series, isomerism, naming organic compounds, types of formulae.

Core Organic Chemistry

Enthalpy

Endothermic / Exothermic, energy profiles, calorimetry, bond energies, Hess' Law, enthalpy changes.

Rates & Equilibria

Factors affecting rate of reaction, collision theory, catalysts, Boltzmann distribution, Le Chatelier, dynamic equilibrium.

Group 2 & Group 7, Ion Tests

Physical properties, trends in reactivity, displacement, alkalinity, making bleach, redox, ion tests.

Periodicity

Groups and periods, ionisation energy, melting point, trends in structure, atomic radius.

Bonding and Structure

lonic bonding, covalent bonding, shapes of molecules, metallic bonding, allotropes, London dispersion forces, dipoles, hydrogen bonding.

Periodic Table & Energy

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Acids & Redox

Titration, Oxidation number, redox reactions.

Amounts of Substance

Avagadro's constant, molar mass, concentration, pV=nRT.

Compounds, Formulae, Equations

Balanced symbol equations, ionic formulae, ionic equations, molecular formulae.



Atoms & Electrons

Subatomic particles, models of atom electron configuration, orbitals.