

Curriculum Map 2021 onwards

| Year view Subject: Chemistry | | | | |
|------------------------------|--|--|---|---|
| Year 7 | Knowledge/Content | Skills | Assessments/Checkpoints | Comments |
| Autumn Term 1 | Safety in the laboratory; Acids and alkalis Introduction to acids & alkalis; Testing using litmus indicator; Neutralisation investigation; The pH scale; Review of topic | Using lab equipment safely including a Bunsen burner; Carrying out simple chemical reactions such as neutralisation and making/using indicators; Writing a scientific method | Test – Acids & alkalis | See coloured chart at the very bottom of these tables for the skills mapping. |
| Autumn Term 2 | Particles & solutions: Introduction. History of particle theory; Particles in solids, liquids, gases; Diffusion investigation; Expansion & contraction; Changing state; Melting ice diagnostic task | Making accurate qualitative observations Using equipment to make quantitative observations | Diagnostic task – melting ice cubes | |
| Spring Term 1 | Explaining solutions: solvents, solutes, solutions; Measuring mass of dissolved solid; Effect of temperature solubility, saturation; Solubility at different temperatures; Saturation & solubility curves; Review of topic Separation techniques: Filtration, Evaporation, Obtaining pure salt practical, Distillation; Chromatography | Graph drawing and interpretation; related maths skills Drawing conclusions from a scientific investigation Explaining observations by relation to theory Technical skills to carry out filtration, evaporation, crystallisation, chromatography | Test – Particles and solutions Practical skills – Separation challenge Test – Separation techniques | |
| Spring Term 2 | Separation challenge Chemical Changes: Evidence for chemical change – precipitation, colour change, gas produced; Endo and exothermic reactions Combustion; Review of topic | Making accurate observations; Explaining chemical reactions in relation to particles or chemicals present; Designing an investigation and drawing valid conclusions; Graph skills; Writing word equations | Test – Chemical changes | |
| Summer Term 1 | Atoms, Elements and Compounds topic: Idea of atom & definition of element; Element symbols; Metals & non metals & place on the periodic table; Compounds definition; Products and reactants in word equations | Making observations Systematically classifying and categorising the natural world | Test – Atoms, elements and compounds | |
| Summer Term 2 | Y7 examination Hydrogels investigation | Practical skills – investigation planning, collecting & recording results, writing up, concluding & evaluating | Y7 Exam | |

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| Year view Subject: Chemistry | | | | |
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| Year 8 | Knowledge/Content | Skills | Assessments/Checkpoints | Comments |
| Autumn Term 1 | Atoms and elements: Idea of atoms and subatomic structure; Arrangements of elements on the periodic table; Properties and periodicity | Drawing electronic structures | Test – Atoms & Elements | See coloured chart at the very bottom of these tables for the skills mapping. |
| Autumn Term 2 | Compounds: Properties of compounds compared to elements; Conservation of mass related to atom conservation | Writing word equations; Recalling and using combining powers to write chemical formulae; Graph skills & analysing results (combining Mg with oxygen) | Test - Compounds | |
| Spring Term 1 | Metals and metal compounds: Properties of metals; Displacement reactions; Reactions of metals with acids; Reactions of metal oxides, hydroxides and carbonates with acids; Carbon dioxide and hydrogen tests; Rusting | Writing and balancing symbol equations Production of salts | | |
| Spring Term 2 | Metals & compounds cont. from Spring 1 Earth and Atmosphere: Structure of the Earth; Sedimentary, igneous and metamorphic rocks; Hard and soft water; The carbon cycle; Recycling | | Test – reactions of metals and their compounds | |
| Summer Term 1 | Earth & Atmosphere cont. from Spring 2 | | Test – Earth and Atmosphere | |
| Summer Term 2 | Year 8 examination Chemical Reactions: Combustion; Oxidation; Reduction; Thermal decomposition; Precipitation; Neutralisation | Classifying chemical reactions and predicting results of chemical reactions | Year 8 examination | |

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| Year 9 | Knowledge/Content | Skills | Assessments/Checkpoints | Comments |
| Autumn Term 1 | Particles, Separation techniques and water treatment Pure substances; Formulations Separating mixtures linked to water treatment and sewage treatment Metal reactivity and reactions of acids Reactions of acids (recap); Redox with respect to addition or removal of oxygen; Competition for oxygen; Production of salts | Graph skills – interpreting heating/cooling curves Distillation of contaminated water Producing a pure salt Deducing an order of reactivity Predicting reactions from the reactivity series | Test – Particles, separation techniques and water treatment | See coloured chart at the very bottom of these tables for the skills mapping. |
| Autumn Term 2 | Metals topic cont. from Autumn 1 Working scientifically and rates of reaction Apparatus and techniques to obtain quantitative data; Factors that influence rate of reaction; Explain rate of reaction with reference to the particle model | Planning and devising hypotheses and experiments to test those hypotheses Using measuring equipment to gain quantitative data and draw conclusions Graph skills – interpreting RoR graphs, drawing tangents to a curve | Test – Metal reactivity and reactions of acids | |
| Spring Term 1 | Rates continued from Autumn 2 Atomic structure and periodic table Structure of and development of the model of the atom; Isotopes and RAM; Periodicity in groups 1, 7 and 0. | Linking observations to atomic structure and electrons | Test – WS and Rates of reaction | See coloured chart at the very bottom of these tables for the skills mapping. |
| Spring Term 2 | Atomic structure and periodic table continued from Spring 1 Bonding: Bonding; structure and properties of matter | | Test – Atomic structure and periodic table | |
| Summer Term 1 | Bonding continued from Spring 2 | | Small test – simple bonding (ionic & covalent) | |
| Summer Term 2 | Bonding continued from Summer 1 Synoptic – extraction of copper from malachite | | Test – bonding and the structure and properties of matter End of year test | |

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| Year 10 | Knowledge/Content | Skills | Assessments/Checkpoints | Comments |
| Autumn Term 1 | Organic 1: Obtaining useful fractions from crude oil; Cracking; Properties and trends of the alkane, alkene, alcohol and carboxylic acid; homologous series; Reactions of the above functional groups; Addition polymers | Testing for functional groups Describing conditions and products from common organic reactions | Test – Organic 1 | See coloured chart at the very bottom of these tables for the skills mapping |
| Autumn Term 2 | Acids, redox and electrolysis: Linking acids -> H ⁺ ions; redox to electrons; Writing ionic equations and half equations for acid/base, displacement, redox reactions; Electrolysis | Carrying out electrolysis Predicting and explaining products from displacement and electrolysis reactions Writing ionic equations and half equations Explaining redox in terms of electrons | Test – Acids, redox and electrolysis | |
| Spring Term 1 | Quantitative Chemistry: Mole calculations for solids, solutions, gases; Expected yield, % yield; atom; economy; calculations; Titrations | Carrying out a titration to measure the concentration of an acid or alkali | | |
| Spring Term 2 | Quantitative Chemistry cont. from Spring 1 | Determine concentration of vinegar | Test – Quantitative Chemistry Mock exams | |
| Summer Term 1 | Earth's atmosphere and resources | | Test – Earth's atmosphere and resources | |
| Summer Term 2 | Chemical analysis Gas tests; Cation tests; Anion tests; Instrumental methods | Investigation – using all analytical techniques covered so far to carry out murder investigation | Topic test – Chemical analysis | |

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| Year 11 | Knowledge/Content | Skills | Assessments/Checkpoints | Comments |
| Autumn Term 1 | Energy changes Exo/endothermic reactions Enthalpy calculations Making cells Rechargeable batteries | Measuring enthalpy changes by calorimetry Explaining galvanic cells by reference to metal reactivity | Test – Energy changes | See coloured chart at the very bottom of these tables for the skills mapping. |
| Autumn Term 2 | Organic 2 Review Organic 1 Esters Condensation Polymers Biochemistry | | Topic test – Organic 2 | |
| Spring Term 1 | Mock exams Equilibria Le Chatallier’s principle The Haber process Fertilisers | Predicting and explaining the effect of changing conditions on the position of equilibria | Mock exams Topic test - Equilibria | |
| Spring Term 2 | Review Earth’s atmosphere, resources & LCAs Revision | | | |
| Summer Term 1 | External Exams | External Exams | External Exams | External Exams |
| Summer Term 2 | External Exams | External Exams | External Exams | External Exams |

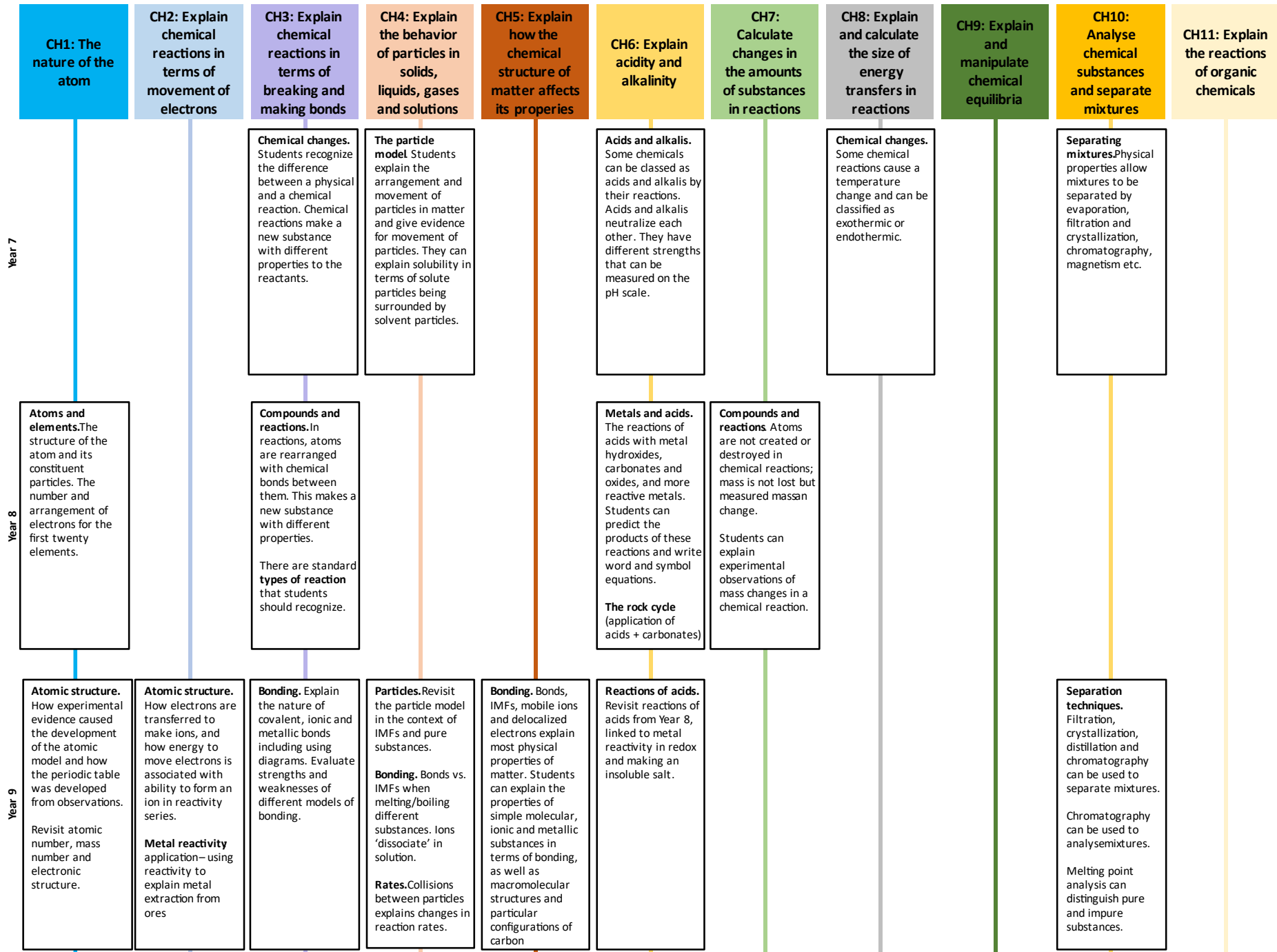
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| Year 12 | Knowledge/Content | Skills | Assessments/Checkpoints | Comments |
| Autumn Term 1 | Atomic structure Bonding Amount of Substance Kinetics | Making a standard solution Titrations Relevant CPACs | Atomic structure, bonding, kinetics tests | |
| Autumn Term 2 | Introduction to organic chemistry, alkanes Energetics | Calorimetry Relevant CPACs | Amount of substance test | |
| Spring Term 1 | Alkenes, alcohols Equilibria | Determination of an equilibrium constant Using organic glassware Distillation & reflux Relevant CPACs | Energetics, organic 1, equilibria tests | |
| Spring Term 2 | Organic analysis Redox, group 2, group 7 | Organic analysis Test tube tests for inorganic ions Characterisation of bleach (experiment design & implementation) Relevant CPACs | Organic 2, redox/group 2/group 7 tests | |
| Summer Term 1 | Rate equations Organic practical skills | Recrystallisation Characterisation of melting point Characterisation of acid by titration Continuous monitoring Clock reactions Relevant CPACs | Mock exams | |
| Summer Term 2 | Rate equations cont. Optical isomers and carbonyls | Determination of activation energy Manipulation of Arrhenius equation to determine constants from log graphs Relevant CPACs | Organic practical skills, rate equations tests | |

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| Year 13 | Knowledge/Content | Skills | Assessments/Checkpoints | Comments |
| Autumn Term 1 | Acylation Thermodynamics Kp | Preparation of a pure organic solid Preparation of a pure organic liquid Using Hess cycles to determine enthalpy changes for reactions that cannot be measured directly Relevant CPACs | Carbonyls, thermodynamics and Kp tests | |
| Autumn Term 2 | Acids and bases Electrochemistry | Plotting pH curves Measuring the emf of an electrochemical cell Prediction of reaction feasibility & direction by consideration of electrode potentials Relevant CPACs | Acids and bases, electrochemistry tests | |
| Spring Term 1 | Aromatic chemistry, amines, polymers, biochemistry Chemical properties of period 3 elements and their oxides Transition metals | Preparation of an inorganic complex Redox titrations Iron tablet analysis Autocatalysis investigation Relevant CPACs | Mock exams Amines, polymers, biochemistry test | |
| Spring Term 2 | Reactions of ions in aqueous solution, including catalysis NMR Organic synthesis | Identification of transition metal ions Interpretation of NMR spectra and structure determination | NMR, aqueous solutions tests | |
| Summer Term 1 | Review & revision | | A Level exams | |
| Summer Term 2 | | | A Level exams | |

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Year 10

Metal reactivity.
More reactive metals have a greater tendency to form ions.

Explain oxidation and reduction in terms of loss or gain of electrons.

Explain electrolysis in terms of electron movement.

Application– production of ores

Energy changes.
Breaking bonds is endothermic and making bonds is exothermic; the balance determines the reaction enthalpy.

Organic. The boiling points of organic molecules are explained by IMFs.

The structures of polymers give different properties.

Uses of materials – the structure and uses of alloys (revision from Y9), polymers (revision from Y10), glass ceramics and composites.

Quantitative chemistry/acids:
The difference between strong and weak acids. (Link to: CH11 carboxylic acids).

Application: Chemistry of the atmosphere– combustion can form SO_x and NO_x which cause acid rain.

Acid-base neutralisation can remove carbon dioxide from flue gases.

Quantitative chemistry. The use of moles to calculate the amounts of solids, solutions or gases reacting in a chemical reaction, including where one reactant is limiting.

The % yield and atom economy can be calculated for a reaction.

Acid-base titrations can be used to determine concentrations.

Energy changes.
Reactions are endothermic or exothermic depending on the balance of bonds broken and bonds made.

Electrical energy can be released from galvanic (chemical) cells or fuel cells.

Application: batteries; uses of fuel cells

Equilibria. Some reactions are reversible and the position of equilibrium can be manipulated.

Application: The Haber process.

Organic. Crude oil is separated by fractional distillation.

Tests for organic functional groups.

Analytical Chemistry Tests for gases and positive and negative ions.

Organic. Useful organic products can be produced by cracking, fermentation, and chemical reactions.

The reactions of alkanes, alkenes, alcohols, carboxylic acids.

Polymers can be made by addition or condensation reactions.

Application– uses of organic chemicals.

Application– Biological polymers have specific properties and uses.

Application: Chemistry of the atmosphere– recent changes to the atmosphere are due to the combustion of hydrocarbon fuels

Year 11