

Chemistry

Key Stage 2 Curriculum includes



	Year 9	Year 10	Year 11	Year 12	Year 13
Autumn 1	Atoms <ul style="list-style-type: none"> Atoms elements and compounds Equations Separating mixtures Scientific models of the atom Subatomic particles Isotopes and ions Electronic configuration The development of the periodic table Group 0 Group 7 Group 1 	Energy and Chemical Change <ul style="list-style-type: none"> Oxidation and reduction The reactivity series Displacement reactions Extraction of metals Losing and gaining electrons The pH scale Neutralisation of Acids Soluble salts and insoluble bases Strong and weak acids Electrolysis Oxidation and reduction Extraction of metals Electrolysis of aqueous solutions 	Identifying substances <ul style="list-style-type: none"> Pure and impure substances Formulations Chromatography Gas tests 	Atomic structure <ul style="list-style-type: none"> The atom Atomic models Relative mass The mass spectrometer Using mass spectra Electronic structure Ionising energies Amount of substances <ul style="list-style-type: none"> The mole Gases and the mole Chemical equations Titrations Formulas Chemical yield Atom economy 	Electrode potentials and cell <ul style="list-style-type: none"> Electrode potentials Standard electrode potentials Electrochemical series Electrochemical cells Acids, Bases and pH <ul style="list-style-type: none"> Acids bases and Kw pH calculations The acid dissociation constant Titration d pH curves Titration calculations Buffer action Calculating the pH of Buffers Period 3 element s <ul style="list-style-type: none"> Period 3 elements Period 3 oxides
Autumn 2			Atmosphere <ul style="list-style-type: none"> The earth's atmosphere The atmosphere today Increase of oxygen levels Decrease of carbon dioxide levels Greenhouse gases The impact of human activity 	Bonding <ul style="list-style-type: none"> Ionic Bonding Covalent Bonding Chare clouds Shapes of molecules Polarisation Intermolecular forces Metallic bonding Properties of metals Energetics <ul style="list-style-type: none"> Enthalpy 	Transition Metals <ul style="list-style-type: none"> Transition metals Complex ions Isomerism in complex ions Formation of coloured compounds Ligand substitution reactions Variable oxidation states Transition metals titrations Metal aqua ions Isomers and carbonyl compounds <ul style="list-style-type: none"> Optical isomerism

			<ul style="list-style-type: none"> • Global climate change • Carbon footprints 	<ul style="list-style-type: none"> • Bond Enthalpies • Measuring Enthalpy changes • Hess' Law 	<ul style="list-style-type: none"> • Aldehydes ad Ketones • Hydroxy nitriles • Carbocyclic acids and esters • Reaction's and uses of esters • Acyl chlorides • Acid anhydrides • Purifying organic compounds <p>Aromatic compounds and amines</p> <ul style="list-style-type: none"> • Aromatic compounds • Reactions of aromatics • Amines and amides • Reactions of amines
Spring 1	<p>Bonding</p> <ul style="list-style-type: none"> • The three states of matter • Changing states • Identifying states of a substance • State symbols • Chemical bonds • Ionic bonding • Properties of ionic compounds • Covalent bonding • Small molecules • Giant covalent structures • Graphene 	<p>Rates</p> <ul style="list-style-type: none"> • Calculating the rate of reaction • Collision theory • Plotting the reaction rates • Catalysts • Reversible reactions • Closed systems • Changing reaction conditions 	<p>Using resources</p> <ul style="list-style-type: none"> • Sustainable development • Drinking water • Waste water treatment • Alternative methods of extracting metals • Life cycle assessments • Reducing the use of resources 	<p>Kinetics</p> <ul style="list-style-type: none"> • Reaction rates • Catalysts • Measuring reaction rates <p>Equilibria and redox reactions</p> <ul style="list-style-type: none"> • Reversible reactions • Industrial processes • The equilibrium constant • Factors effecting the equilibrium constant • Redox reactions • Redox equations 	<p>Polymers</p> <ul style="list-style-type: none"> • Condensation polymerisation • Monomers and repeating units • Disposing of polymers <p>Amino acids, proteins and DNA</p> <ul style="list-style-type: none"> • Amino acids • Proteins • Enzymes DNA • Cisplatin
Spring 2	<ul style="list-style-type: none"> • Fullerenes • Polymers • Metallic bonding • Properties of metals • alloys 			<p>Periodicity</p> <ul style="list-style-type: none"> • The periodic table • Periodicity <p>Group 2 and group 7 elements</p> <ul style="list-style-type: none"> • Group 2 • Group 2 compounds • Group 7 	<p>Further synthesis and Analysis</p> <ul style="list-style-type: none"> • Organic synthesis • NMR spectroscopy • C NMR • H NMR • Chromatography • Gas chromatography

				<ul style="list-style-type: none"> • Halide ions • Tests for ions <p>Introduction to organic chemistry</p> <ul style="list-style-type: none"> • Formulas • Functional groups • Nomenclature • Mechanisms] • Isomers • E/Z isomers 	
Summer 1	<p>Quantitate</p> <ul style="list-style-type: none"> • Conservation of mass • Relative formula mass • Apparent change in mass • Amount of substances • Calculating the amount of substances • Balanced equations • Limiting reactions • Concentrations of solutions 			<p>Alkanes and Halogenoalkanes</p> <ul style="list-style-type: none"> • /alkanes and petroleum • Alkanes as fuels • Synthesis of chloroalkanes • Halogenoalkanes • Nucleophilic substitution • Elimination reactions • Alkenes and alcohols • Alkenes • Reactions of alkenes • Additional polymers • Alcohols • Dehydration of alcohols • Ethanol production • Oxidation of alcohols • 	

				Organic Analysis <ul style="list-style-type: none"> • Tests for functional groups • Mass spectrometry • Infrared spectroscopy 	
Summer2		Organics <ul style="list-style-type: none"> • Crude oils and hydrocarbons • Fractional distillation • Alkanes • Burning fuels • Cracking hydrocarbons • Bromine water 		Thermodynamics <ul style="list-style-type: none"> • Enthalpy changes • Born Haber cycles • Enthalpies of solution • Entropy • Free energy change Rate equation and Kp <ul style="list-style-type: none"> • Monitoring reactions • Reaction rates and graphs • Rate equations • The initial rate methods • Clock reactions • Rate and concentration graph • The rate determining step • The Arrhenius equation • Gas equilibria • Changing gas equilibria 	