

Co-teaching GCSE Chemistry and GCSE Combined Science: Trilogy

This high level co-teaching guide will help you plan your route through the course. You'll be able to see what common themes and topics span across both GCSE Chemistry (8462) and GCSE Combined Science: Trilogy (8464).

Once the specifications are accredited we'll be able to publish the extra content for each topic to support your more detailed lesson planning.

4.1 Atomic structure and the periodic table

4.1.1 A simple model of the atom, symbols, relative atomic mass, electronic charge and isotopes

Subject content ref	Both specifications	GCSE Chemistry (8462) only
4.1.1.1	Atoms, elements and compounds	
4.1.1.2	Mixtures	
4.1.1.3	Scientific models of the atom	
4.1.1.4	Relative electrical charges of subatomic particles	
4.1.1.5	Size and mass of atoms	
4.1.1.6	Electronic structure	
4.1.1.7	Relative atomic mass	

4.1.2 The periodic table

Subject content ref	Both specifications	GCSE Chemistry (8462) only
4.1.2.1	The periodic table	
4.1.2.2	Development of the periodic table	
4.1.2.3	Metals and non metals	

4.1.2.4	Group 0	
4.1.2.5	Group 1	
4.1.2.6	Group 7	

4.1.3 Properties of transition metals

Subject content ref	Both specifications	GCSE Chemistry (8462) only
4.1.3.1		Comparison with Group 1 elements
4.1.3.2		Typical properties

4.2 Bonding structure, and the properties of matter

4.2.1 Chemical bonds, ionic, covalent and metallic

Subject content ref	Both specifications	GCSE Chemistry (8462) only
4.2.1.1	Chemical bonds	
4.2.1.2	Ionic bonding	
4.2.1.3	Ionic compounds	
4.2.1.4	Covalent bonding	
4.2.1.5	Metallic bonding	

4.2.2 How bonding and structure are related to the properties of substances

Subject content ref	Both specifications	GCSE Chemistry (8462) only
4.2.2.1	The three states of matter	
4.2.2.2	State symbols	
4.2.2.3	Properties of ionic compounds	
4.2.2.4	Properties of small molecules	
4.2.2.5	Polymers	
4.2.2.6	Giant covalent structures	
4.2.2.7	Properties of metals and alloys	

4.2.2.8	Metals as conductors	
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4.2.3 Structure and bonding of carbon

Subject content ref	Both specifications	GCSE Chemistry (8462) only
4.2.3.1	Diamond	
4.2.3.2	Graphite	
4.2.3.3	Graphene and fullerenes	

4.2.4 Bulk and surface properties of matter including nanoparticles

Subject content ref	Both specifications	GCSE Chemistry (8462) only
4.2.4.1		Sizes of particles and their properties
4.2.4.2		Uses of nanoparticles

4.3 Quantitative chemistry

4.3.1 Chemical measurements, conservation of mass and the quantitative interpretation of chemical equations

Subject content ref	Both specifications	GCSE Chemistry (8462) only
4.3.1.1	Conservation of mass and balanced chemical equations	
4.3.1.2	Relative formula mass	
4.3.1.3	Mass changes when a reactant or product is a gas	
4.3.1.4	Chemical measurements	

4.3.2 Use of amount of substance in relation to masses of pure substances

Subject content ref	Both specifications	GCSE Chemistry (8462) only
4.3.2.1	Moles (HT only)	
4.3.2.2	Amounts of substances in	

	equations (HT only)	
4.3.2.3	Using moles to balance equations (HT only)	
4.3.2.4	Limiting reactants (HT only)	
4.3.2.5	Concentration of solutions (HT only)	

4.3.3 Yield and atom economy of chemical reactions

Subject content ref	Both specifications	GCSE Chemistry (8462) only
4.3.3.1.		Percentage yield
4.3.3.2		Atom economy
4.3.4		Using concentrations of solutions in mol/dm ³ (HT only)
4.3.5		Use of amount of substance in relation to volumes of gases
4.3.3.1.		Percentage yield

4.4 Chemical changes

4.4.1 Reactivity of metals

Subject content ref	Both specifications	GCSE Chemistry (8462) only
4.4.1.1	Metal oxides	
4.4.1.2	The reactivity series	
4.4.1.3	Extraction of metals and reduction	
4.4.1.4	Oxidation and reduction in terms of electrons (HT only)	

4.4.2 Reactions of acids

Subject content ref	Both specifications	GCSE Chemistry (8462) only
4.4.2.1	Reactions of acids with metals	
4.4.2.2	Neutralisation of acids and salt production	
4.4.2.3	Soluble salts	
4.4.2.4	The pH scale and neutralisation	
4.4.2.5	Titrations	
4.4.2.6	Strong and weak acids (HT only)	

4.4.3 Electrolysis

Subject content ref	Both specifications	GCSE Chemistry (8462) only
4.4.3.1	The process of electrolysis	
4.4.3.2	Electrolysis of molten ionic compounds	
4.4.3.3	Using electrolysis to extract metals	
4.4.3.4	Electrolysis of aqueous solutions	
4.4.3.5	Representation of reactions at electrodes as half equations (HT only)	

4.5 Energy changes

4.5.1 Exothermic and endothermic reactions

Subject content ref	Both specifications	GCSE Chemistry (8462) only
4.5.1.1	Energy transfer during exothermic and endothermic reactions	
4.5.1.2	Reaction profiles	

4.5.1.3	The energy change reactions (HT only)	
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4.5.2 Chemical cells and fuel cells

Subject content ref	Both specifications	GCSE Chemistry (8462) only
4.5.2.1		Cells and batteries
4.5.2.2		Fuel cells

4.6 The rate and extent of chemical change

4.6.1 Rate of reaction

Subject content ref	Both specifications	GCSE Chemistry (8462) only
4.6.1.1	Calculating rates of reactions	
4.6.1.2	Factors which affect the rate of chemical reactions	
4.6.1.3	Collision theory and activation energy	
4.6.1.4	Catalysts	

4.6.2 Reversible reactions and dynamic equilibrium

Subject content ref	Both specifications	GCSE Chemistry (8462) only
4.6.2.1	Reversible reactions	
4.6.2.2	Energy changes and reversible reactions	
4.6.2.3	Equilibrium	
4.6.2.4	The effect of changing conditions on equilibrium (HT only)	
4.6.2.5	The effect of changing concentration (HT only)	
4.6.2.6	The effect of temperature on equilibrium (HT only)	

4.6.2.7	The effect of pressure changes on equilibrium (HT only)	
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4.7 Organic chemistry

4.7.1 Carbon compounds as fuels and feedstock

Subject content ref	Both specifications	GCSE Chemistry (8462) only
4.7.1.1	Crude oil, hydrocarbons and alkanes	
4.7.1.2	Fractional distillation and petrochemicals	
4.7.1.3	Properties of hydrocarbons	
4.7.1.4	Cracking and alkenes	

4.7.2 Reactions of alkenes and alcohols

Subject content ref	Both specifications	GCSE Chemistry (8462) only
4.7.2.1		Structure and formulae of alkenes
4.7.2.2		Reactions of alkenes
4.7.2.3		Alcohols
4.7.2.4		Carboxylic acids

4.7.3 Synthetic and naturally occurring polymers

Subject content ref	Both specifications	GCSE Chemistry (8462) only
4.7.3.1		Addition polymerisation
4.7.3.2		Condensation polymerisation (HT only)
4.7.3.3		Amino acids (HT only)
4.7.3.4		DNA (deoxyribonucleic acid) and other naturally occurring polymers

4.8 Chemical analysis

4.8.1 Purity, formulation and chromatography

Subject content ref	Both specifications	GCSE Chemistry (8462) only
4.8.1.1	Pure substances	
4.8.1.2	Formulations	
4.8.1.3	Chromatography	

4.8.2 Identification of common gases

Subject content ref	Both specifications	GCSE Chemistry (8462) only
4.8.2.1	Test for hydrogen	
4.8.2.2	Test for oxygen	
4.8.2.3	Test for carbon dioxide	
4.8.2.4	Test for chlorine	

4.8.2 Identification of ions by chemical and spectroscopic means

Subject content ref	Both specifications	GCSE Chemistry (8462) only
4.8.3.1		Flame tests
4.8.3.2		Metal hydroxides
4.8.3.3		Carbonates
4.8.3.4		Halides
4.8.3.5		Sulfates
4.8.3.6		Instrumental methods
4.8.3.7		Flame emissions spectroscopy

4.9 Chemistry of the atmosphere

4.9.1 The composition and evolution of the Earth's atmosphere

Subject content ref	Both specifications	GCSE Chemistry (8462) only
4.9.1.1	The proportions of different gases in the atmosphere	

4.9.1.2	The Earth's early atmosphere	
4.9.1.3	How oxygen increased	
4.9.1.4	How carbon dioxide decreased	

4.9.2 Carbon dioxide and methane as greenhouse gases

Subject content ref	Both specifications	GCSE Chemistry (8462) only
4.9.2.1	Greenhouse gases	
4.9.2.2	Human activities which contribute to an increase in greenhouse gases in the atmosphere	
4.9.2.3	Global climate change	
4.9.2.4	The carbon footprint and its reduction	

4.9.3 Common atmospheric pollutants and their sources

Subject content ref	Both specifications	GCSE Chemistry (8462) only
4.9.3.1	Atmospheric pollutants from fuels	
4.9.3.2	Properties and effects of atmospheric pollutants	

4.10 Using resources

4.10.1 Using the Earth's resources and obtaining potable water

Subject content ref	Both specifications	GCSE Chemistry (8462) only
4.10.1.1	Using the Earth's resources and sustainable development	
4.10.1.2	Potable water	
4.10.1.3	Waste water treatment	
4.10.1.4	Alternative methods of extracting metals (HT only)	

4.10.2 Life cycle assessment and recycling

Subject content ref	Both specifications	GCSE Chemistry (8462) only
4.10.2.1	Life cycle assessment	
4.10.2.2	Ways of reducing the use of resources	

4.10.3 Using materials

Subject content ref	Both specifications	GCSE Chemistry (8462) only
4.10.3.1		Corrosion and its prevention
4.10.3.2		Alloys as useful materials
4.10.3.3		Ceramics, polymers and composites

4.10.4 The Haber process and the use of NPK fertilisers

Subject content ref	Both specifications	GCSE Chemistry (8462) only
4.10.4.1		The Haber process
4.10.4.2		Production of uses of NPK fertilizers
4.10.4.1		The Haber process