Science – Chemistry

ALDER Community High School

KS4

Threshold concept lesson

	Topic 1 – Atomic structure	Lessons
Year 10 Autumn	History of atom	1
	Atomic Structure	1
	Atomic Mass	1
	Isotopes	1
	History of the Periodic Table	1
	Modern Periodic Table (with electron configuration)	1
		6
	Topic 2 – States of matter and mixtures	**Lessons**
Year 10 Autumn	***States of matter (+ changes of state)***	1
	Mixtures and purity	1
	Filtration and Crystallisation	1
	Chromatography (2 lessons)	2
	Distillation	1
	Water purification	1
		7
	Topic 3 – Ionic bonding	
Year 10 Autumn	***Cation and anion formation***	1
	Ionic bonding	1
	Naming Ionic compounds and formula	1
	Testing for cations (Triple)	1
	Testing for anions (Triple)	1
	Unknown ions (Triple)	1
	Ionic equations (Triple)	1
	Flame Photometry (Triple)	1
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	Topic 4 – Covalent Bonding/Types of substance	
Year 10 Autum	Covalent bonds	2
	Giant covalent compounds	1
	Graphene and fullerenes	1
	Properties of ionic compounds	1
	Properties of covalent bonding	1
	Metallic bonding	1
	Bonding summary	1

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Year 10 Spring	**Topic 5 – Calculations Involving Masses**		
	Relative formula mass	1	
	Percentage composition	1	
	Empirical formula	1	
	Making MgO	2	
	Conservation of mass – word and symbol equations	1	
	Balancing equations (if needed – should be confident from KS3)	1	
	Moles	1	
	Reacting masses (H)	1	
	Limiting reactants and Stoichiometry (H)	1	
	Concentration	1	
	Percentage Yield (Triple)	1	
	Atom Economy (Triple)	1	
	Calculations with gases (Triple)	1	
		11	14
Year 10 Summer	**Topic 6 – Acids**		
	Acids, alkalis and indicators	1	
	Strong and weak acids (H)	1	
	Investigating pH (core practical)	1	
	Neutralisation and Naming salts	1	
	Neutralisation - Metal carbonates and acids (practical)	1	
	Neutralisation equations (H)	1	
	Making copper sulphate (core practical)	1	
	Insoluble salts	1	
	Titration	1	
	Titration calculations (Triple)	2	
		9	11
Year 11 Autumn	**Topic 7 - Electrolysis**		
	Electrolysis Introduction	1	
	Electrolysis – molten	1	
	Electrolysis - solution	1	
	Electrolysis (Core practical)	1	
	Purification of copper	1	
	Electroplating (Triple)	1	
	Chemical and fuel cells (Triple)	1	
		5	7

Year 11 Autumn	**Topic 8 – Metals**		
	Reactivity series and displacement	1	
	Metal ores and extraction	1	
	Biological methods of extraction (H)	1	
	Metallic Bonding	1	
	Recycling	1	
	Life Cycle assessment	1	
	Transition Metals (Triple)	1	
	Alloys (Triple)	1	
	Corrosion (Triple)	1	
		6	9
Year 11 Spring	**Topic 9 – Rate and energy changes of reaction**		
	Collision Theory	1	
	Surface area (core practical)	1	
	Analysing rate data	1	
	Temperature (core practical)	1	
	Catalysts	1	
	Nanoparticles (Triple)	1	
	Heat energy changes – Exothermic and Endothermic reactions	1	
	Reaction profiles	1	
	Bond energy calculations (H)	1	
	Reversible reactions and equilibria	1	
	Le Chatelier Principle (H)	1	
	The Haber Process and fertilisers (Triple)	1	
		10	12
Year 11 Spring	**Topic 10 – Fuels and Earth Science**		
	Crude oil and hydrocarbons	1	
	Fractional distillation	1	
	Cracking and hydrogen	1	
	Combustion	1	
	Pollution	1	
	Allotropes of carbon	1	
	Earth's early atmosphere	1	
	The changing atmosphere – Greenhouse Effect	1	
	The modern atmosphere - Climate change	1	
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	Topic 10 – Organic Chemistry (Triple only)	
Year 11 Spring	Naming and drawing hydrocarbons	1
	Reactions of alkenes	1
	Alcohols	1
	Ethanol Production	1
	Carboxylic acids	1
	Combustion of alcohols	1
	Additions polymerisation	1
	Condensation polymerisation	1
	Polymers	1
	Ceramics and polymers	1
	Thermosetting and thermosoftening polymers	1
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