

Summer 2022 Triple Chemistry Foundation

Paper 1			
			Revision pages
Topic 1 Atomic structure and the periodic table	Major Focus 4.1.1 A simple model of the atom, symbols, relative atomic mass, electronic charge and isotopes	<ul style="list-style-type: none"> • Atoms, elements and compounds • Mixtures • The development of the model of the atom • Relative electrical charges of subatomic particles • Size and mass of atoms • Relative atomic mass • Electronic structure 	Pages 16-19 24 -29 31 - 33
	Major focus 4.1.2 The periodic table	<ul style="list-style-type: none"> • Electron arrangement and position in the periodic table • Development of the periodic table • Metals and non-metals • Group 0 • Group 1 • Group 7 	Pages 34 - 35 37 - 46
Topic 2 Bonding, structure and the properties of matter	Major Focus 4.2.1 Chemical bonds	<ul style="list-style-type: none"> • Ionic bonding • Ionic compounds • Covalent bonding • Metallic bonding • Limitations of models 	Pages 47-56, 61
	Major focus 4.2.2 How bonding and structure are related to the properties of substances	<ul style="list-style-type: none"> • States of matter • State symbols • Properties of ionic compounds • Properties of small molecules • Polymers • Giant covalent structures • Properties of alloys • Metals as conductors 	Pages 50 57 60 63-65
	Major focus 4.2.4 Bulk and surface properties of matter including nanoparticles	<ul style="list-style-type: none"> • Sizes of particles and their particles • Uses of nanoparticles 	Pages 66 - 67

Topic 3 Quantitative chemistry	Minor Focus 4.3.2 Use of amount of substances in relation to masses of pure substances	<ul style="list-style-type: none"> • Concentration of solutions 	Pages 70 79 - 80
Topic 4 Chemical change	Major focus 4.4.2 Reactions of metals	<ul style="list-style-type: none"> • Reactions of acids with water • Neutralisation of acids and salt production • Soluble salts • pH scale and neutralisation • Titrations • Strong and weak acids 	Pages 94 – 96 87 -92
	Required Practical	Required practical 1 – preparation of a pure, dry sample of a soluble salt from an insoluble oxide or carbonate, using a Bunsen burner to heat dilute acid and a water bath or electric heater to evaporate the solution Required practical 2 – determination of the reacting volumes of solutions of a strong acid and a strong alkali by titration	Page 92 Pages 88-89
Topic 5 Energy change	Major focus 4.5.1 Exothermic and endothermic reactions	<ul style="list-style-type: none"> • Energy transfer during exothermic and endothermic reactions • Reaction profiles • Energy change of reactions – bond energies 	Pages 106 - 109
	Required practical	Required practical 4 – Investigate the variables that affect the temperature changes in reacting solutions such as. E.g acid plus metals, acid plus carbonates, neutralisations, displacement of metals.	Page 107

Paper 2

			Revision Pages
Topic 6 Rate and extent of chemical change	Major Focus 4.6.1 Rates of reaction	<ul style="list-style-type: none"> Calculating rates of reaction Factors which affect the rate of chemical reactions Collision theory and activation energy Catalysts 	Pages 117 - 124
	Major Focus 4.6.2 Reversible reactions and dynamic equilibrium	<ul style="list-style-type: none"> Reversible reactions Energy changes and reversible reactions Equilibrium The effect of changing conditions on equilibrium The effect of changing concentration The effect of temperature changes on equilibrium The effect of pressure changes on equilibrium 	Pages 127 – 129
	Required Practical	Required practical 5: investigate how changes in concentration affect the rates of reactions by a method involving measuring the volume of a gas produced and a method involving a change in colour or turbidity.	Pages 122 - 123
Topic 7 – Organic chemistry	Major focus 4.7.1 Carbon compounds as fuels and feedstock	<ul style="list-style-type: none"> Crude oil, hydrocarbons and alkenes Fractional distillation and petrochemicals Properties of hydrocarbons Cracking and alkenes 	Pages 132 - 135
Topic 8 – Chemical analysis	Major focus 4.8.3 Identification of ions by chemical and spectroscopic means	<ul style="list-style-type: none"> Flame tests Metal hydroxide Carbonates Halides Sulfates Instrumental methods Flame emission spectroscopy 	Pages 157 - 160
	Required practical	Required practical 6: investigate how paper chromatography can be used to separate and tell the difference between coloured substances. Students should calculate R_f values.	Pages 154 - 155
	Required practical	Required practical activity 7: use of chemical tests to identify the ions in unknown single ionic compounds covering the ions from sections Flame tests through to Sulfates	Pages 157 - 158
Topic 9 – Chemistry of the atmosphere	Major focus 4.9.1 The composition and the evolution of the earth's atmosphere	<ul style="list-style-type: none"> The proportions of different gases in the atmosphere The Earth's early atmosphere How oxygen increased How carbon dioxide decreased 	Pages 157 – 160
Topic 10 – Using resources	Major focus 4.10.1 Using the Earth's resources and obtaining potable water	<ul style="list-style-type: none"> Using the Earth's resources and sustainable development Potable water Wastewater treatment Alternative methods of extracting metals 	Pages 178 - 179 184 - 186

	Major focus 4.10.2 Life cycle assessment and recycling	<ul style="list-style-type: none"> • Life cycle assessment • Ways of reducing the use of resources 	Pages 180 – 182
	Major focus 4.10.4 The Haber process and the use of NPK fertilisers	<ul style="list-style-type: none"> • The Haber process • The production and uses of NPK fertilisers 	Pages 188 – 191
	Required practical	Required practical activity 8: analysis and purification of water samples from different sources, including pH, dissolved solids and distillation.	Pages 185