fortismere KS4 Chemistry - Separate Curriculum Map 2022 - 23

Curriculum Intent
See Curriculum Map 2021 - 2022

Yr10 (KS4)	Topic Area	Key knowledge/skills (what has to be learnt)	Examples of key compulsory practicals for students	Knowledge/Skills revisited and to be revisited	What does good look like?	Resources/support at home
	C4 Chemical calculations	Calculations regarding the following; Relative Atomic Mass, Relative Formula Mass. The Mole. Balanced Equations and Reacting Masses. Yield and Atom Economy. Concentration and Titrations. Volume of gases.	**RP2** - Carry out an Acid - Alkali Titration using the appropriate equipment and method and subsequent calculations to determine the Concentration of the unknown reagent.		Please see the published checklists on the website. For students to be assessed to have 'mastered' the curriculum they should be competent in the Aiming for 6 criteria. Students who have progressed beyond mastery are competent in many aspects of the Aiming for 8 criteria.	Kerboodle Google classroom BBC Bitesize My GCSE Science Cognito Science Videos & Notes Physics & Maths Tutor past exam questions practice
	C5 Chemical changes	Metals and the reactivity series. Extracting metals, Oxidation and Reduction. OIL RIG. Using Chemical Reactions	Displacement reactions with a variety of metals and soluble metal compounds. **RP1** - Prepare a Pure Dry sample of a Soluble Salt from	Simple Oxidation states		Kerboodle Google classroom BBC Bitesize My GCSE Science Cognito Science Videos & Notes

		Making salts and neutralisation. Strong and weak acids. Be able to compare pH from simple concentrations.	the reaction of either an Insoluble Metal Carbonate or Metal Oxide and an Acid, using appropriate apparatus and technique.			Physics & Maths Tutor past exam questions practice
	C6 Electrolysis	Electrolysis of a molten ionic substance. Equations for the reactions at the Anode and Cathode. Half Equations REDOX The manufacture of aluminium, including energetic and environmental aspects. Electrolysis of aqueous solutions; predicting the products at the Electrodes.	Electrolysis of Copper Sulphate solution using a Copper Anode and Aluminium foil Cathode (or coin) **RP3** - Electrolysis of Aqueous solutions using Inert electrodes.	Bonding Oxidation states		Kerboodle Google classroom BBC Bitesize My GCSE Science Cognito Science Videos & Notes Physics & Maths Tutor past exam questions practice
	C7 Energy changes	Exothermic and endothermic reactions and their uses. Energy profile diagrams and activation energy. Using bond energies to calculate energy changes. Chemical cells and batteries.	Experience a variety of Endo & Exothermic reactions. **RP4** - Investigating temperature changes. Using appropriate equipment and methods, investigate the variables that affect the energy changes in chemical reactions involving one aqueous solution. Simple Chemical Cell and Fruit batteries.	Validity of data and analysis		Kerboodle Google classroom BBC Bitesize My GCSE Science Cognito Science Videos & Notes Physics & Maths Tutor past exam questions practice

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Year 11 **3 Rates Equilibrium and Organic chemistry**	**C8 Rates and equilibrium**	Measuring the rate of a reaction - using different methods. Collision theory - factors that affect the rate of a reaction; surface area, concentration, temperature and catalysts. Controlling reactions Reversible reactions and equilibrium. Le Chatelier's principle and the effect of changing conditions.	Carry out a variety of experiments to observe and determine the rate of reaction when Concentration, Surface area of a solid reagent and Temperature are varied. Also when a Catalyst is introduced. **RP5** - Investigate how changes in Concentration affect the rate of reactions using one method involving the measuring of a gas produced and another involving a change of colour or turbidity.	Key practical skills, variables, validity, errors, manipulation, graphs and analysis. Topic 7		Kerboodle Google classroom BBC Bitesize My GCSE Science Cognito Science Videos & Notes Physics & Maths Tutor past exam questions practice
	C9 Crude oil and fuels	Crude oil and alkanes. Hydrocarbons and combustion. Fractional distillation of oil - making useful products. Cracking - breaking long molecules into shorter ones.	Burning a Hydrocarbon and determining the products using chemical reactions. Lime water, Cobalt chloride Demo Fractional distillation Crack a long chain hydrocarbon and test for the products using Bromine water or KMnO4	Bonding Separating mixtures		Kerboodle Google classroom BBC Bitesize My GCSE Science Cognito Science Videos & Notes Physics & Maths Tutor past exam questions practice
	C10 Organic reactions	Reactions of alkenes with halogens, hydrogen and steam.	Bromine water test. Making an Ester	Bonding		Kerboodle Google classroom BBC Bitesize My GCSE Science

		The structure of alcohols. carboxylic acids and esters, and how to name them. The reactions and uses of alcohol.				Cognito Science Videos & Notes Physics & Maths Tutor past exam questions practice
	C11 Polymers	The formation of Addition polymers from alkenes. Condensation polymers. Repeating units and equations. Natural and synthetic polymers. DNA.	Making Slime Making Nylon Extracting DNA from a fruit.	Bonding		Kerboodle Google classroom BBC Bitesize My GCSE Science Cognito Science Videos & Notes Physics & Maths Tutor past exam questions practice
4 Chemical Analysis and the Earth's Resources	**C12 Chemical analysis**	Pure substances and mixtures and formulations. Paper chromatography. Testing for gases (H_2, O_2, CO_2, Cl_2) Identifying positive ions using flame tests and sodium hydroxide solution. Identifying carbonate, sulphate and halide ions. Instrumental analysis - flame emission spectroscopy.	**RP6** - Using Paper Chromatography to determine the R_f values for a variety of colours in Food Dyes. **RP7** - Chemical testing for gases. Chemical testing for positive and negative ions. Flame testing for Metal ions with Diffraction grating.			Kerboodle Google classroom BBC Bitesize My GCSE Science Cognito Science Videos & Notes Physics & Maths Tutor past exam questions practice

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	C 13 The Earth's atmosphere	How the atmosphere developed. The current composition of the atmosphere. The greenhouse effect. Global warming and its consequences. Atmospheric pollutants.	Research tasks. Greenhouse Effect Demo using Carbon dioxide , Large beaker, black paper disc and a powerful lamp.			Kerboodle Google classroom BBC Bitesize My GCSE Science Cognito Science Videos & Notes Physics & Maths Tutor past exam questions practice
Yr11 (KS4)	**Topic Area**	**Key knowledge/skills (what has to be learnt)**	**Examples of key compulsory practicals for students**		**What does good look like?**	**Resources/support at home**
	C14 The Earth's resources	Finite and renewable resources. Treating water to make it Potable (safe to drink). Dealing with wastewater. Extracting metals from their ores. Purification of copper using electrolysis. Bioleaching and phytomining. Life cycle assessments (LCA) and reusing / recycling.	Research tasks. **RP8** - Purify and test water. Analyse and purify water from different sources, including pH, dissolved solids and distillation. Greenhouse Effect Demo using Carbon dioxide , Large beaker, black paper disc and a powerful lamp.	REDOX Electrolysis	Please see the published checklists on the website. For students to be assessed to have 'mastered' the curriculum they should be competent in the Aiming for 6 criteria. Students who have progressed beyond mastery are competent in many aspects of the Aiming for 8 criteria.	Kerboodle Google classroom BBC Bitesize My GCSE Science Cognito Science Videos & Notes Physics & Maths Tutor past exam questions practice

			Carry out an LCA on a product of their choice and present.			
	C15 Using the Earth's resources	Rusting and its prevention. Alloys and their uses. Properties of polymers. Glass, ceramics and composites. The Haber process; Industrial manufacture of Ammonia and compromise conditions. Making fertilisers.	Iron nails in a variety of situations to test for rate of Rusting.	Chemical changes Bonding Rates & Equilibrium C14 Earth's resources C11 Polymers		Kerboodle Google classroom BBC Bitesize My GCSE Science Cognito Science Videos & Notes Physics & Maths Tutor past exam questions practice