Curriculum Map Year 11 - Chemistry

Topic Name	Term	Content / skills developed with link to NC / exam board subject content (if applicable)	Reflection on previous learning	Progress to future learning	Global Citizenship links	Qatar National Identity links
3A Energetics Exothermic and endothermic reactions. Measuring enthalpy change Measuring enthalpy change (combustion) Measuring enthalpy change Theory Bond Energy	1	3.1 know that chemical reactions in which heat energy is given out are described as exothermic, and those in which heat energy is taken in are described as endothermic 3.2 describe simple calorimetry experiments for reactions such as combustion reactions. 3.3 calculate the heat energy change from a measured temperature change using the expression $Q = mc\Delta T$ 3.4 calculate the molar enthalpy change (ΔH) from the heat energy change, Q 3.5 draw and explain energy level diagrams to represent exothermic and endothermic reactions 3.6 know that bond-breaking is an endothermic process and that bond-making is an exothermic process 3.7 use bond energies to calculate the enthalpy change during a chemical reaction 3.8 practical: investigate temperature changes accompanying some of the following types of change: combustion reactions Neutralisation reactions	Links to section 1(e) Mole calculations	Understanding energy changes are reflected per mole of a substance so that energy changes can be compare for different chemical reactions - AS topic 1 amounts of substances	Be prepared to show perseverance and dedication by taking responsibility for own learning	Conscious thinking about my Future Conscious thinking about my Environment

3C Reversible reactions and equilibria	1	3.17 know that some reactions are reversible and this is indicated by the symbol ⇌ in equations 3.18 describe reversible reactions such as the dehydration of hydrated copper(II) sulfate and the effect of heat on ammonium chloride. 3.19C know that a reversible reaction can reach dynamic equilibrium in a sealed container 3.20C know that the characteristics of a reaction at dynamic equilibrium are: • the forward and reverse reactions occur at the same rate • the concentrations of reactants and products remain constant 3.21C understand why a catalyst does not affect the position of equilibrium in a reversible reaction 3.22C predict, with reasons, the effect of changing either pressure or temperature on the position of equilibrium in a reversible reaction; *references to Le Chatelier's principle are not required.*	Links to KS3 'types of chemical reactions'	Develop understanding that not all chemical reactions are irreversible AS - topic 9 - Kinetics and equilibrium	Be prepared to show perseverance and dedication by taking responsibility for own learning	Sustainability : self esteem and participation Sustainability: responsibility and creativity
Section 2: Inorganic chemistry (f) Acids, alkalis and titrations	1	2.28 describe the use of litmus, phenolphthalein and methyl orange to distinguish between acidic and alkaline solutions 2.29 understand how to use the pH scale, from 0 - 14, can be used to	Recall KS3 learning from Y7 about Acids and alkalis	Develop understanding of the nature of acid/alkali reactions practising equation writing	Demonstrate independence and engagement whilst building fundamental	Sustainability : self esteem and participation

		classify solutions as strongly acidic (0 – 3), weakly acidic (4 – 6), neutral (7), weakly alkaline (8 – 10) and strongly alkaline (11 – 14) 2.30 describe the use of universal indicator to measure the approximate pH value of an aqueous solution 2.31 know that acids in aqueous solution are a source of hydrogen ions and alkalis in aqueous solution are a source of hydroxide ions. 2.32 know that alkalis can neutralise acids 2.33C describe how to carry out an acid-alkali titration.		and balancing skills – A2 Acid base equilibrium	skills in chemistry	Sustainability: responsibility and creativity
Section 2: Inorganic chemistry (g) Acids, bases and salt preparations	1	2.34 know the general rules for predicting the solubility of ionic compounds in water: • common sodium, potassium and ammonium compounds are soluble • all nitrates are soluble • common chlorides are soluble, except those of silver and lead(II) • common sulfates are soluble, except for those of barium, calcium and lead(II) • common carbonates are insoluble, except for those of sodium, potassium and ammonium • common hydroxides are insoluble except for those of sodium,	Links to section 1a) and the concept of solubility	Develop familiarity with Chemical symbols/ formulae and equations to recall common inorganic salts	Demonstrate independence and engagement whilst building fundamental skills in chemistry	Sustainability : self esteem and participation Sustainability: responsibility and creativity

		potassium and calcium (calcium hydroxide is slightly soluble) 2.35 understand acids and bases in terms of proton transfer 2.36 understand that an acid is a proton donor and a base is a proton acceptor 2.37 describe the reactions of hydrochloric acid, sulfuric acid and nitric acid with metals, bases and metal carbonates (excluding the reactions between nitric acid and metals) to form salts 2.38 know that metal oxides, metal hydroxides and ammonia can act as bases, and that alkalis are bases that are soluble in water. 2.39 describe an experiment to prepare a pure, dry sample of a soluble salt, starting from an insoluble reactant 2.40C describe an experiment to prepare a pure, dry sample of a soluble salt, starting from an acid and alkali 2.42 *practical: prepare a sample of pure, dry hydrated copper(II) sulfate crystals starting from copper(II) oxide.* 2.41C describe an experiment to prepare a pure, dry sample of an insoluble salt, starting from two soluble reactants				

		2.43C *practical: prepare a sample of pure, dry lead(II) sulfate.*				
Section 1: Principles of chemistry (i) Electrolysis	2	1.51 know that covalent compounds do not usually conduct electricity 1.55C understand why covalent compounds do not conduct electricity 1.56C understand why ionic compounds conduct electricity only when molten or in aqueous solution 1.57C know that anion and cation are terms used to refer to negative and positive ions respectively 1.58C describe experiments to investigate electrolysis, using inert electrodes, of molten compounds (including lead(II) bromide) and aqueous solutions (including sodium chloride, dilute sulfuric acid and copper(II) sulfate) and to predict the products 1.59C write ionic half-equations representing the reactions at the electrodes during electrolysis and understand why these reactions are classified as oxidation or reduction 1.60C *practical: investigate the electrolysis of aqueous solutions.*	Recall of section 1f) fundamentals around the structure and properties of ionic compounds and make links to similarities between those and properties of metals	Develop understanding of the nature and role of electrons in electrical conductivity and bonding/ decomposition AS - topic 8 redox	Be prepared to show perseverance and dedication by taking responsibility for own learning	Conscious thinking about my Environment Sustainability : self esteem and participation