Chemistry AS 2020/21

Week		Topic / unit of work KEN (4hrs /fortnight)	Knowledge	Skills	Assessment opportunities Tues A1 – SHS & B2 – KEN	Topic / unit of work SHS (5hrs /fortnight)	Knowledge	Skills
1A	6.09.21	No lessons			No lessons	No lessons		
2B	13.09.21	2.1.2 compounds, formulae and equations	writing formulae of ionic compounds prediction of ionic charge from the periodic table names and formulae of ions chemical equations.	Maths Skills: Ratio's	Baseline assessment	2.1.1 model of the atom	atomic structure isotopes	HSW1 & 7 - models
3A	20.09.21	2.2.1 ionisation energies			1 – SHS - atomic structure & bonding	2.1.3 the mole PAG 1.1 – 1.3	relative isotopic mass and relative atomic mass mass spectroscopy	PAG 1.1-1.3 Determining the relative atomic mass of a metal Maths skills: The mass spectrometer and calculation of relative atomic mass
4B	27.09.21	2.2.2 bonding and structure	electrons and shells atomic orbitals filling of orbitals electron configurations. electron-pair repulsion theory shapes of molecules and ions	Students should be able to draw 3-D diagrams to illustrate shapes of molecules and ions.	2 – KEN Formula, equations and naming compounds		the amount of substance, the mole, and the Avogadro constant molar mass calculations involving. masses and moles	Maths skills: Moles Maths skills: Empirical and molecular formulae Maths skills: Relative formula mass
5A	4.10.21		writing formulae of ionic compounds	logical thinking	3 – SHS – mole calcs		concentration, solution volumes, and the mole	Maths skills: Mass of a gas

			prediction of ionic charge from the periodic table names and formulae of ions Properties chemical equations.				molar gas volumes the ideal gas equation. stoichiometry quantities of reactants and products from equations percentage yield atom economy	Maths skills: The ideal gas equation Maths skills: Moles and concentration
6B	11.10.21		Ionic bonding giant ionic lattice structures. properties of ionic compounds.		5 – KEN ionisation energies			Maths skills: percentages
7A	18.10.21		single covalent bonding multiple covalent bonding dative covalent (coordinate) bonding average bond enthalpy Properties	Thinking- linking bonding to potential structures and properties	6 – SHS – mole calcs	3.2.1 – enthalpy changes PAG 3.1 – 3.3	exothermic and endothermic changes enthalpy profile diagrams activation energy standard enthalpy changes	Maths skills: Calculating experimental errors
Half term								
8B	1.11.21	2.1.4 acids and redox PAG 2.1 – 2.3	acids and bases neutralisation.	PAG 2.1-2.3	7 – KEN Structure and Bonding	3.2.1 – enthalpy changes PAG 3.1 – 3.3	calculating energy changes from experiments determination of enthalpy changes directly	PAG 3.1-3.3 Maths skills: Measuring enthalpy changes

9A	8.11.21		analysing titration results by calculation	preparation of a standard solution carrying out a titration practical techniques for measuring the volume of solutions.	8 – SHS – Q=mCAT		average bond enthalpy calculating enthalpy changes from bond enthalpies enthalpy cycles indirect determination of enthalpy change from enthalpy changes of formation indirect determination of enthalpy change from enthalpy changes of combustion unfamiliar enthalpy cycles.	Maths skills: Bond enthalpy Maths skills: Hess' law and enthalpy cycles Maths skills: Hess' law
10B	15.11.21		oxidation number oxidation and reduction redox reactions.	Maths skills: Balancing redox equations	9 – KEN Titrations	4.1.1 basic concepts	the terms alkyl, aliphatic, alicyclic, and aromatic the general formula of a homologous series IUPAC rules of nomenclature for organic compounds	naming organic molecules
11A	22.11.21		Balancing redox reactions identifying oxidising and reducing agents	Maths Skills, ratio's	10 – SHS – Hess cycles		general formula displayed formula structural formula skeletal formula structural isomerism determination of possible structural formulae from a molecular formula	drawing molecules using different types of formulae

12B	29.11.21	3.1.1 periodicity	Patterns in periodic table Ionisation energies melting point	research development of periodic table (GCSE Recap)	11 – KEN Oxidation and reduction	4.1.2 alkanes	Homolytic and heterolytic bond fission curly arrows and reaction mechanisms addition, substitution, and elimination reactions	drawing reaction mechanisms
13A	6.12.21		patterns in bonding and intermolecular forces	application of knowledge to new situations	12 – SHS – organic		alkanes as saturated hydrocarbons bonding in alkanes shapes and bond angles of alkanes variations in the boiling points of alkanes.	be able to draw 3-D diagrams
14B	13.12.21	3.1.2 Group II	Patterns in group 2. Melting points, ionisation energies, uses	Research Skills- uses	13 – KEN Halogens	4.1.3 alkenes	the general formula of alkenes the nature and shape of the C=C bond.	Maths skills - using general formulae
Xmas hols								
15A	3.01.22	3.1.2 Group II	Flame tests, patterns in reactivity of group 2 compounds		14 – SHS – Qu from mock	4.1.3 alkenes	stereoisomerism the Cahn–Ingold–Prelog priority rules	apply CIP rules
16B	10.01.22	REVISION			REVISION	REVISION		
17A	17.01.22	MOCKS			MOCKS	MOCKS		
18B	24.01.22	3.1.3 Group VII	Group 7 - patterns/ reactivity/ displacement	safe handling of hazardous chemicals - writing risk assessments/ using hazard cards	15 – KEN – Qu from mock		the reactivity of alkenes the addition reactions of alkenes. electrophiles mechanism of electrophilic addition in alkenes	drawing reaction mechanisms

							Markownikoff's rule	
19A	31.01.22		Group 7 - Flame tests, investigating reactivity/ solubility thermal decomposition of group 2 compounds	Practical skills- safe handling of chemicals, ability to predict products of reactions	16 – SHS – Qu from mock	4.2.1 alcohols	polarity, solubility, and volatility of alcohols classification of alcohols	Make links to hydrogen bonding
20B	7.02.22	3.1.4 Qualitative analysis PAG 4.1 – 4.3	Inorganic analysis	PAG 4	17 – KEN – Qu from mock		combustion of alcohols oxidation of alcohols elimination from alcohols substitution of alcohols by halide ions.	Equations should use [O] to represent the oxidising agent
Half term								
21A	21.02.22	3.1.4 Qualitative analysis PAG 4.1 – 4.3	Challenge identify unknown chemicals	Logical analysis, planning a sequence of tests to identify unknowns	18 – SHS – free radical sub	4.2.2 halogenoalkanes	hydrolysis of haloalkanes nucleophiles nucleophilic substitution rates of hydrolysis of primary haloalkanes	drawing reaction mechanisms
22B	28.02.22	3.2.2 – 3.2.3 rates and equilibrium PAG 9	Recap how rate is affected - Temperature/ Catalysts/ Concentration (Pressure)/ Surface Area	logical thinking	19 – KEN qualitative analysis		uses of organohalogen compounds the ozone layer breakdown of the ozone layer by radicals.	Students could be expected to construct similar equations for other stated radicals
23A	7.03.22		How to measure rate	Practical skills - follow instructions, safe handling of equipment	20 – SHS - mechanisms	4.2.3 organic synthesis PAG 5.1 – 5.3	Quickfit apparatus for distillation and heating under reflux techniques for preparation and	PAG 5.1 - 5.3

							purification of an organic liquid	
24B	14.03.22		Maxwell-Boltzman distribution	Maths Skills- interpreting graphs	21 – KEN Rates of reactions		properties and reactions of functional groups constructing two-stage synthetic routes.	Students will be expected to be able to devise two-stage synthetic routes by applying transformations between all functional groups encountered up to this point of the specification
25A	21.03.22		equilibrium - position of equilibrium, factors that affect equilibrium		22 – SHS - synthesis	4.2.4 analysis	mass spectra for identification fragmentation peaks	Graph skills
26B	28.03.22		Ka - equilibrium expression, RICE tables	Maths skills: ratio's calculations, rearranging equations, determining units	23 – KEN equilibrium		absorption of infrared radiation by atmospheric gases infrared spectroscopy combining spectroscopic techniques	Graph skills
Easter Hols								
27A	18.04.22	REVISION			REVISION	REVISION		
28B	25.04.22	MOCKS			MOCKS	MOCKS		
29A	2.05.22	A2 rates	Rates and orders of reactions	Graph interpretation		A2 aromatic chemistry		
30B	9.05.22	A2 rates						
31A	16.05.22							
32B	23.05.22							
Half term								

		Work experience				Work experience		
		A2 rates				A2 aromatic chemistry		