



## YEAR 12 - Teacher 2

'An ambitious curriculum that meets the needs of all'

### Medium Term Planning - Topic: Physical and Inorganic Chemistry

Curriculum Intent	In addition to working further on objectives from KS4, pupils will be taught, following National Curriculum guidelines, the following this term:			
Skills/Assessment Objective Links	Unit Title	Spec	Knowledge	Skills developed from learning knowledge
	Atomic structure	3.1.1	Structure of the atom. Electronic configuration. Mass spectrometry	Working out relative atomic mass from precise sub atomic particle masses. Identifying isotopes. Writing electronic configuration for atoms and ions. Calculating time of flight.
	Periodicity	3.2.1	Trends in atomic radii, first ionisation energy and melting points across period 3.	Explaining atomic radii, first ionisation energy and melting points using electronic configurations
	Calculations	3.1.2	Moles in solutions and standard solutions (titrations) ideal gas law, empirical formulae, balanced equations	Calculating concentrations using titration calculations. Utilising $PV=nRT$ for working out moles with gases. Using combustion analysis data to work out empirical formulae. Balancing of equations
	Equilibria	3.1.6	Le Chateliers principle. Dynamic equilibrium. $K_c$ .	Suggest what changing variables will do to the rate of a particular reaction. State the meaning of dynamic equilibrium. Calculating $K_c$ and working out relevant units for a given reaction.
	Kinetics	3.1.5	Collision theory. Maxwell-Boltzmann distribution	Describe reactions in terms of particles colliding and explaining activation energy using this. Sketching and labelling Maxwell-Boltzmann distribution and explaining how different variables affect it's shape.
	Energetics	3.1.4	Enthalpy change. Calorimetry. Hess's law. Bond enthalpy	Identifying exo and endothermic reactions. Calculating energy changes using calorimetry. Constructing and using Hess's cycle to calculate energy changes indirectly.
Spiritual, moral, social, and cultural development	SMSC: PSHE/British Values: Links to research in UK Skills Builder: Links to practical applications at University and research			
Numeracy	Balancing equations, re-arranging equations, substituting values, standard form, interpreting graphs			
Literacy	Vocabulary Tier 2: Highlighted above Vocabulary Tier 3: Highlighted above Reading: Exam questions, Textbooks Writing: Correct usage of key terms in exam responses Oracy: Use of subject specific language			
Becoming future ready	Careers/Employability: Chemist. Pharmacist. Medic. Vet. Biological science. Sports sciences.			
Adaptation	Throughout this topic, quality first teaching will provide differentiation:			
QFT/SEND Provision	By product: By resource: Doodle powerpoints, homework books, exam papers, textbooks By Intervention: by providing different levels of supervision and support By Progressive Questioning: exploring pupils' understanding through interactive dialogue. By Grouping: according to prior attainment, gender, social preference, preferred learning style. By Task: Pupils should be involved in the identification of targets which are meaningful to them and in the selection of an appropriate task from the given range.			

	<b>By Offering Optional Activities:</b> In class or as homework, to extend learning. This QFT/SEND provision will be explicit within the lesson-by-lesson schemes of work.			
<b>Implementation Curriculum Delivery</b>	Unit Title	Spec	Knowledge	Skills developed from learning knowledge
Learning Outcomes (Knowledge) <b><u>Core Knowledge</u></b>	Atomic structure	3.1.1	Structure of the atom. <b><u>Electronic configuration.</u></b> Mass spectrometry	Working out relative atomic mass from precise sub atomic particle masses. Identifying isotopes. Writing electronic configuration for atoms and ions. Calculating time of flight.
	Periodicity	3.2.1	<b><u>Trends</u></b> in atomic radii, first ionisation energy and melting points across period 3.	Explaining atomic radii, first ionisation energy and melting points using electronic configurations
	Calculations	3.1.2	<b><u>Moles in solutions</u></b> and standard solutions (titrations) ideal gas law, empirical formulae, balanced equations	Calculating concentrations using titration calculations. Utilising $PV=nRT$ for working out moles with gases. Using combustion analysis data to work out empirical formulae. Balancing of equations
	Equilibria	3.1.6	Le Chateliers principle. Dynamic equilibrium. <b><u>K<sub>c</sub></u></b> .	Suggest what changing variables will do to the rate of a particular reaction. State the meaning of dynamic equilibrium. Calculating K <sub>c</sub> and working out relevant units for a given reaction.
	Kinetics	3.1.5	Collision theory. <b><u>Maxwell-Boltzmann distribution</u></b>	Describe reactions in terms of particles colliding and explaining activation energy using this. Sketching and labelling Maxwell-Boltzmann distribution and explaining how different variables affect it's shape.
	Energetics	3.1.4	Enthalpy change. Calorimetry. <b><u>Hess's law.</u></b> Bond enthalpy	Identifying exo and endothermic reactions. Calculating energy changes using calorimetry. Constructing and using Hess's cycle to calculate energy changes indirectly.
<b>Current learning to be developed in the future within:</b>	Y13 topics			
<b>Assessment</b>	Regular assessment using past exam questions. Classwork and homework based on exam papers and self marking so pupils become familiar with how work is assessed.			
<b>Impact</b>	Pupils will be ready to study the more advanced topics in Y13 that build upon the foundation knowledge gained here. They will be able to develop mathematical competencies so they can apply knowledge to unfamiliar and real life mathematical problems.			