A Level Chemistry

Module 1 – Development of practical skills in chemistry

- Practical skills assessed in a written examination
- Practical skills assessed in the practical endorsement

Half-Term 1	Half-Term 2	Half-Term 3	Half-Term 4	Half-Term 5	Half-Term 6
Module 2: Foundations in chemistry		**Module 3: Periodic table and energy**		**Module 4: Core organic chemistry**	
This module acts as an important bridge into AS and A Level Chemistry from GCSE level. It allows learners to develop important quantitative techniques involved in measuring masses, gas and solution volumes, including use of volumetric apparatus. Learners are also able to develop their mathematical skills during their study of the amount of substance.		This module provides learners with a knowledge and understanding of the important chemical ideas that underpin the study of inorganic and physical chemistry. It allows learners to develop important qualitative practical skills, especially observational skills required for analysis, and accurate quantitative techniques involved in determination of energy changes and reaction rates.		This module introduces organic chemistry and its important applications to everyday life. Learners are provided an opportunity to develop important organic practical skills.	
2.1 Atoms and reactions 2.1.1 Atomic structure and isotopes 2.1.2 Compounds, formulae and equations	2.1 Atoms and reactions 2.1.3 Amount of substance 2.1.4 Acids 2.1.5 Redox	3.1 The periodic table 3.1.1 Periodicity 3.1.2 Group 2 3.1.3 The halogens	3.1 The periodic table 3.1.4 Qualitative analysis 3.2 Physical chemistry	4.1 Basic concepts and hydrocarbons 4.1.1 Basic concepts of organic chemistry 4.1.2 Alkanes 4.1.3 Alkenes	4.1 Alcohols, haloalkanes and analysis 4.2.1 Alcohols 4.2.2 Haloalkanes 4.2.3 Organic synthesis 4.2.4 Analytical techniques

			3.2.1 Enthalpy changes 3.2.2 Reaction rates 3.2.3 Chemical equilibrium		
	PAG 1 - Moles determination PAG 2 - Acid-base titration	PAG 4 - Qualitative analysis of ions	PAG 3 - Enthalpy determination PAG 4 - Qualitative analysis of ions PAG 9 - Rates of reaction - continuous monitoring method	PAG 7 - Qualitative analysis of organic functional groups	PAG 5 - Synthesis of an organic liquid
PAG techniques / skills covered (minimum)					
	<u>PAG 1</u> Use of appropriate apparatus to record measurements and volume of a gas 1.2.2(a) <u>PAG 2</u> Measurement of volume of a liquid 1.2.2 (a) Use of volumetric flask, including accurate technique for making up standard solution 1.2.2(e)	Use of lab apparatus for qualitative test for ions 1.2.2(d)(iii) Make and record qualitative observations 1.2.1(d)	<u>PAG 3</u> Use of appropriate apparatus to record measurements of temperature 1.2.2(a) <u>PAG 9</u> Measurement of rate of reaction by a continuous monitoring method 1.2.2(I)(ii) Use of appropriate apparatus to record measurements of time 1.2.2(a)	Use of lab apparatus for qualitative tests for organic functional groups 1.2.2(d)(iii) Use of a water bath or electric heater of sand bath for heating 1.2.2(b) Make and record qualitative observations 1.2.1(d)	Use of lab apparatus for heating under reflux 1.2.2(d)(iii) Purification of a liquid product, including use of a separating funnel 1.2.2(g)(ii) Use of melting point apparatus 1.2.2(h) Use of thin layer or paper chromatography 1.2.2(i) Identification of potential hazards (risk

	Use of lab apparatus for titration, using burette and pipette 1.2.2(d)(i) Use of acid-base indicators in titrations of weak/strong acids with weak/strong alkalis 1.2.2(f)		Use of appropriate software to process data 1.2.1(g)		assessment), CPAC 3

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Module 5: Physical chemistry and transition elements		**Module 6: Organic chemistry and analysis**		**Exam preparation and revision**	
The content in this module assumes knowledge from modules 2 & 3. This module extends the study of; energy, reaction rates and equilibria, and the periodic table.		The content in this module assumes knowledge from modules 2 & 4. This module introduces several new functional groups and emphasizes the importance of organic synthesis		Content revision and skills	
5.1 Rates, equilibrium and pH 5.1.1 How fast?	5.2 Energy 5.2.1 Lattice enthalpy 5.2.2 Enthalpy and	6.1 Aromatic compounds, carbonyls and acids	6.2 Nitrogen compounds, polymers nd synthesis		

5.1.2 How far? 5.1.3 Acids, bases and buffers	entropy 5.2.3 Redox and electrode potentials <u>5.3 Transition</u> <u>elements</u> 5.3.1 Transition elements 5.3.2 Qualitative analysis	6.1.1 Aromatic compounds 6.1.2 Carbonyl compounds 6.1.3 Carboxylic acids and esters	6.2.1 Amines 6.2.2 Amino acids, amides and chirality 6.2.3 Polyesters and polyamides 6.2.4 Carbon-carbon formation 6.2.5 Organic synthesis <u>6.3 Analysis</u> 6.3.1 Chromatography and qualitative analysis 6.3.2 Spectroscopy		
PAG 9 - Rates of reaction - continuous monitoring method PAG 10 - Rates of reaction - initial rates method PAG 11 - pH measurement	PAG 8 - Electrochemical cells PAG 4 - Qualitative analysis of ions	PAG 7 - Qualitative analysis of organic functional groups	PAG 6 - Synthesis of an organic solid		
PAG techniques / skills covered (minimum)					
<u>PAG 9</u> Measurement of rate of reaction by a continuous monitoring method 1.2.2(l)(ii) Use of appropriate	<u>PAG 8</u> Setting up electrochemical cells and measuring voltages 1.2.2(j) <u>PAG 4</u> Use of lab apparatus	Use of lab apparatus for qualitative tests for organic functional groups 1.2.2(d)(iii) Use of a water bath or electric heater of	Use of lab apparatus for heating under reflex 1.2.2(d)(ii) Use of lab apparatus for filtration, including use of fluted filter paper, or filtration		

apparatus to record measurements of time 1.2.2(a) Use of appropriate software to process data 1.2.1(g) <u>PAG 10</u> Measurement of rate of reaction by an initial rate method such as a clock reaction 1.2.2(I)(i) Identify and control variables CPAC2 Use appropriate software to process data 1.2.1 (g) <u>PAG 11</u> Measurement of pH using pH charts or pH meter, or pH probe on a data logger. 1.2.2(c)	for qualitative test for ions 1.2.2(d)(iii) Make and record qualitative observations 1.2.1(d)	sand bath for heating 1.2.2(b) Make and record qualitative observations 1.2.1(d)	under reduced pressure 1.2.2(d)(iv) Purification of a solid product by recrystallisation 1.2.2(g)(i) Use of melting point apparatus 1.2.2(h) Use of thin layer or paper chromatography 1.2.2(i) Identification of potential hazards (risk assessment) CPAC3		