

UNIT 1 Chemistry TIMETABLE 2016

Week	Concepts	Text Ch	Minimum set questions from textbook – Chapter review questions	Possible practical work – 3½ – 5 hours (pracs, demos and exercises in TRAB Y11 or 12) including Worksheets from Student Workbook (SW)	SAC Dates and details
Semester 1: Unit 1: How can the diversity of materials be explained?					
Area of Study 1: How can knowledge of elements explain the properties of matter?					
1	Nanoparticles and nanomaterials Elements and the periodic table <ul style="list-style-type: none"> • Elements • Periodic table • Compounds 	1		<i>You tube</i> clips for interest and clarification Prac: Particle theory of matter in SW SW Worksheets 1, 2	
2	<ul style="list-style-type: none"> • Nuclear atom • Electronic configuration 	1		Prac: Flame colours of selected metals Prac: Oxidation states of transition metals SW Worksheets 3	
3	<ul style="list-style-type: none"> • The modern periodic table • Periodic properties • Trends in properties 	2		Prac: Period 3 elements in SW Exercise: The periodic table Exercise: Periodic variation in properties of the elements Exercise: An investigation of ionisation energies SW Worksheets 4, 5	
4	Metals <ul style="list-style-type: none"> • Properties and the model • Experimental determination of the relative reactivity of metals with water, acids and oxygen the extraction of a selected metal • experimental modification of a selected metal • properties and uses of metallic nanomaterials 	3		Prac: Modelling metallic lattices Prac: Growing metal crystals Prac: Modifying the properties of metals Prac: Reactivity of metals with water, acids and oxygen SW Worksheets 6, 7, 8	

5	Ionic compounds <ul style="list-style-type: none"> • properties and model • Electron transfer diagrams • Chemical formulas • Uses • Experimental determination of the factors affecting crystal formation of ionic compounds 	4		Prac: Investigating sodium chloride Prac: investigating ionic compounds Prac: Crystal formation of ionic compounds Prac: Growing crystals of ionic compounds SW Worksheets 9, 10,	
6	Quantifying atoms and compounds <ul style="list-style-type: none"> • Masses of particles • Relative isotopic and atomic masses using mass spectrometry • The mole 	5		Prac: Mole simulation and applications SW Worksheets 11, 12	
7	<ul style="list-style-type: none"> • Practice mole concept calculations and complete all questions form chapters in text book 	5		SW Worksheet 13	
8	<ul style="list-style-type: none"> • Molar mass • Empirical and molecular formulas • percentage composition 	5		Prac: Chemical composition of a compound	Possible SAC: Report of a practical activity: Chemical composition of a compound
9	Carbon chemistry assignment				
9	Materials from molecules <ul style="list-style-type: none"> • Covalent model • Shapes of molecules • Polarity of molecules 	6		Prac: Making molecular models SW Worksheets 14, 15	
10	<ul style="list-style-type: none"> • Properties of molecular substances • Weak bonding between molecules 	7		Prac: Comparing the physical properties of different covalent lattices SW Worksheets 16, 18	
	Carbon lattices and carbon nanomaterials <ul style="list-style-type: none"> • Diamond and graphite • Graphene and fullerenes 	8		Prac: Buckyballs, nanotubes and other allotropes of carbon SW Worksheet 19	
11	Organic compounds <ul style="list-style-type: none"> • Crude oil • Hydrocarbons • Homologous series • Functional groups • Naming of organic compounds 	9		Prac: Investigating hydrocarbons Exercise: Analysis of the physical properties of the first eight hydrocarbons Exercise: Modelling and naming alkanes Prac: Modelling functional groups (Year 12 as well) SW Worksheet 20, 21	
12	<ul style="list-style-type: none"> • Empirical and molecular 	9		Prac: Preparing artificial	

	formula calculations <ul style="list-style-type: none"> Chemical and physical properties of hydrocarbons, alcohols, carboxylic acids and simple esters 			fragrances and flavours (Year 12 as well) SW Worksheets 17, Prac: Reactions and properties of some organic compounds (could be better saved till Year 12)	
13	Polymers <ul style="list-style-type: none"> Formation of addition polymers Differences between thermoplastic and thermosetting Designed polymers Advantages and disadvantages of the use of polymers 	10		Prac: Modelling polymers Prac: Making ghost buster slime Prac: Making an Elastomer Prac: Making a condensation polymer , the amide, nylon SW worksheet 22, 23,	
Area of Study 3: Research investigation					
14	Research investigation <i>(could be moved according to your program)</i>	11		4--6 hours research based on one of the options in the Study Design SW Worksheets Skills practice worksheets	Present as digital scientific poster (practise for Year 12)
15	Revision			SW Worksheet 24	
16	Exams				
17	Exams				Test: MC and extended answer covering all topics in Unit 1
Semester 2: Unit 2: What makes water such a unique chemical?					
Area of Study 1: How do substances interact with water?					
Semester 1 Week 18 Semester 2 Week 1	Properties of water <ul style="list-style-type: none"> Trends in MP and BP of Group 16 hydrides Specific heat capacity and latent heat of water 	12		Investigation: Properties of water (Maybe useful in the Practical investigation) SW Worksheets 25, 26, 27	
Semester 1 Week 19 Semester 2 Week 2	Water as a solvent <ul style="list-style-type: none"> The solution process Precipitation reactions Ionic equations Importance of solvent properties in biological, domestic or industrial contexts 	13		Prac: Effect of polarity on solubility Prac: Stalagmite from a supersaturated solution Prac: Precipitation reactions Prac: Purification of polluted water SW Worksheets 28, 29, 30	
Term 2 holidays – adjust timetable as needed					

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Semester 2: Unit 2: What makes water such a unique chemical? Area of Study 1: How do substances interact with water?					
3	Measurement of solubility and concentration (<i>from AoS 2 but needs to be before acids and pH</i>) <ul style="list-style-type: none"> Solubility and solubility tables Solubility curves Units of concentration 	14		Prac: Determination of the solubility of a salt Prac: Deriving a solubility curve SW Worksheets 31,	
4	Analysis of salt in water <ul style="list-style-type: none"> Sources of salts Mass-mass stoichiometry 	18			Water SAC (ch. 12, 13 and 14)
5	<ul style="list-style-type: none"> Gravimetric Analysis 	18			

6	<p>Acid-base reaction in water</p> <ul style="list-style-type: none"> • Lowry-Bronsted theory • Reactions involving acids and bases and equation writing • Ionic product of water, pH 	15		<p>Prac: Relative strengths of acids Prac: Reactions of hydrochloric acid Prac: Amphiprotic substances in water Prac: Beetroot – a natural indicator Demo: Universal indicator colour display</p> <p>SW Worksheets 32, 33,</p>	SAC (AOS3): Practical investigation (Poster)
7	<ul style="list-style-type: none"> • Strengths of acids and base (No K_a) • Dilutions of solutions • Strong and weak acids and bases and dilute and concentration solutions • Selected acid---base issue – Ocean acidity 	15		<p>Prac: Strong and weak acids Prac: Dilution</p> <p>SW worksheets 34, 35,</p>	
8	<p>Redox reactions in water</p> <ul style="list-style-type: none"> • Oxidation and reduction • Writing equations 	16		<p>Demo: Oxidation--- reduction reactions Prac: The electrochemical</p>	

	<ul style="list-style-type: none"> • Reactivity series • Oxidation numbers • Selected redox issue --- Corrosion • Complex redox • Galvanic cells 			series of metals Prac: Reactivity series of metals Prac: Corrosion 1 Prac: Corrosion 2 SW Worksheets 37, 38, 39	
Semester 2: Unit 2: What makes water such a unique chemical?					
Area of Study 2: How are substances in water measured and analysed?					
	Analysis for acids and bases <ul style="list-style-type: none"> • Sources of acids and bases in waterways • Volume---volume stoichiometry 	20			
8	Volumetric analysis including standard solutions and dilutions	20			
9	<ul style="list-style-type: none"> • Colorimetry and UV---Vis spectroscopy 	18		Prac: Gravimetric analysis of chicken soup Prac: Gravimetric determination of sulfur as sulfate in fertiliser Prac: Chromatography of inks and smarties Prac: Colorimetric determination of phosphorus content in lawn fertiliser Exercise: UV---Vis spectroscopy – concentration of caffeine in a cola SW Worksheets 45,	
10	<ul style="list-style-type: none"> • AAS and calibration 	18		Exercise: AAS --- Determination of concentration of iron in a breakfast cereal SW Worksheets 46, 47,	

11	Analysis for organic compounds <ul style="list-style-type: none"> Organic contaminants in water Chromatography and HPLC 	19		Prac: Chromatography of inks and smarties SW Worksheets 48	
12	<ul style="list-style-type: none"> 				
Term 3 holidays – adjust timetable as needed					
13	<ul style="list-style-type: none"> Practice of stoichiometry 				
Area of Study 3: Practical investigation					
14	Practical investigation <i>(could be moved according to your program – it may suit you to do it near the beginning of the Unit to avoid overlap with student’s Year 12 exams)</i>	21		4–6 hours research based on one of the options in the Study Design Some useful material could be found in the investigations listed above.	Present as digital scientific poster for practice for Year 12 (OR other presentations)

				Prac: Properties of water Prac: Analysis of local water Prac: Purification of polluted water SW Worksheets 52, skills worksheets	
15	Complete all assessment tasks and content				
16	Revision				
17	Exams /Year 12 exams for those doing a Unit 3 or 4 subject. All Year 11 material needs to be completed before these Year 12 exams start.				Test: MC and extended answer covering all topics in Unit 2