

AQA GCSE (9-1) Chemistry Three Year Scheme of Work

This 3-Year Scheme of Work offers a flexible approach for KS4. It is based on three science lessons per fortnight (assuming a two week timetable of two lessons one week and one lesson in the other). Lessons are designed to be flexible and can be used for 40-60 minute sessions. Lessons are scheduled to finish in the second term of Year 11 to allow time for revision and GCSE examinations in the summer term. Please note that some of these lessons only require partial coverage or are shorter than others and therefore sometimes there are more than three lessons in a fortnight.

Year	Term	Week	Lesson number	Lesson title	Lesson objectives	AQA specification reference	Lesson resources (on CD ROM)	Collins Connect resources
Chapter 1: Atomic structure and the periodic table								
Year 9	Term 1	1/2	1.1	Elements and compounds	<ul style="list-style-type: none"> Identify symbols of elements from the periodic table Recognise the properties of elements and compounds. Identify the elements in a compound 	4.1.1.1	Practical sheet 1.1.1, Worksheet 1.1.1, Worksheet 1.1.2, Technician's notes 1.1.1	Quick starter Homework worksheet Homework quiz Slideshow
Year 9	Term 1	1/2	1.2	Atoms, formulae and equations	<ul style="list-style-type: none"> Learn the symbols of the first 20 elements. Use symbols to describe elements and compounds. Use formulae to write equations. 	4.1.1.1	Practical sheet 1.2; Worksheets 1.2.1, 1.2.2 and 1.2.3; Technician's notes 1.2; Presentation 1.2.1	Quick starter Homework worksheet Homework quiz Slideshow Video
Year 9	Term 1	1/2	1.3	Mixtures	<ul style="list-style-type: none"> Recognise that all substances are chemicals Understand that mixtures can be separated into their components Suggest suitable separation and purification techniques for mixtures. 	4.1.1.2, 4.8.1.1	Practical sheet 1.3.1; Worksheets 1.3.1 and 1.3.2; Technician's notes 1.3.1	Quick starter Homework worksheet Homework quiz
Year 9	Term 1	3/4	1.4	Changing ideas about atoms	<ul style="list-style-type: none"> Learn how models of the atom changed as scientists gathered more data. Consider the data Rutherford and Marsden collected. Link their data to our model of the atom. 	4.1.1.3	Worksheets 1.4.1, 1.4.2 and 1.4.3; Technician's notes 1.4.1; Presentation 1.4.1	Quick starter Homework worksheet Homework quiz Video
Year 9	Term 1	3/4	1.5	Modelling the atom	<ul style="list-style-type: none"> Explore the structure of atoms. Consider the sizes of atoms. 	4.1.1.4	Worksheet 1.5.1; Technician's notes 1.5.1; Presentation 1.5.1 'Helium'; Graph plotter 1.5.1	Quick starter Homework worksheet Homework quiz

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					<ul style="list-style-type: none"> ● Explore the way atomic radius changes with position in the periodic table. 			Homework quiz – higher tier
Year 9	Term 1	3/4	1.6	Relating charges and masses	<ul style="list-style-type: none"> ● Compare protons, neutrons and electrons. ● Find out why atoms are neutral. ● Relate the number of charged particles in atoms to their position in the periodic table. 	4.1.1.4	Worksheet 1.6.1; Technician's notes 1.6.1; Presentation 1.6.1	Quick starter Homework worksheet Homework quiz
Year 9	Term 1	5/6	1.7	Sub-atomic particles	<ul style="list-style-type: none"> ● Find out what the periodic table tells us about each element's atoms. ● Learn what isotopes are. ● Use symbols to represent isotopes. 	4.1.1.5	Worksheets 1.7.1 and 1.7.2; Presentation 1.7.1	Quick starter Homework worksheet Homework quiz Slideshow
Year 9	Term 1	5/6	1.8	Electronic structure	<ul style="list-style-type: none"> ● Find out how electrons are arranged in atoms. ● Use diagrams and symbols to show which energy levels they occupy. ● Relate each element's electron configuration to its position in the periodic table. 	4.1.1.6	Worksheets 1.8.1, 1.8.2 and 1.8.3; Technician's notes 1.8.1; Presentation 1.8.1	Quick starter Homework worksheet Homework quiz
Year 9	Term 1	5/6	1.9	The periodic table	<ul style="list-style-type: none"> ● Explain how the electronic structure of atoms follows a pattern. ● Recognise that the number of electrons in an element's atoms outer shell corresponds to the element's group number. ● Use the periodic table to make predictions. 	4.1.2.1	Worksheet 1.9.1, Worksheet 1.9.2, Worksheet 1.9.3, Presentation 1.9.1	Quick starter Homework worksheet Homework quiz Video
Year 9	Term 1	7/8	1.10	Developing the periodic table	<ul style="list-style-type: none"> ● Find out how the periodic table has changed over the 	4.1.2.2	Worksheets 1.10.1 and 1.10.2; Technician's notes 1.10.1; Presentation 1.10.1	Quick starter Homework worksheet

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					<p>years.</p> <ul style="list-style-type: none"> ● Explore Mendeleev's role in its development. ● Consider the accuracy of Mendeleev's predictions. 			Homework quiz
Year 9	Term 1	7/8	1.11	Comparing metals and non-metals	<ul style="list-style-type: none"> ● Review the physical properties of metals and non-metals. ● Compare oxides of metals and non-metals. ● Make predictions about unknown metals and non-metals. 	4.1.2.3	Practical sheet 1.11.1; Worksheet 1.11.1; Technician's notes 1.11.1; Presentations 1.11.1 and 1.11.2.2	Quick starter Homework worksheet Homework quiz
Year 9	Term 1	7/8	1.12	Metals and non-metals	<ul style="list-style-type: none"> ● Explore the links between electron configurations of elements and their properties. ● Find out what happens to the outer electrons when metals react. ● Draw diagrams to show how ions form. 	4.1.1.6	Worksheets 1.12.1 and 1.12.2; Technician's notes 1.12.1	Quick starter Homework worksheet Homework quiz Video
Year 9	Term 1	9/10	1.13	Key concept: The outer electrons	<ul style="list-style-type: none"> ● Review the patterns in the periodic table. ● Compare the trends in Group 1 and Group 7. ● Relate these trends to the number of outer electrons and the sizes of atoms. 		Worksheet 1.13.1; Technician's notes 1.13.1; Presentation 1.13.1	Quick starter Homework worksheet Homework quiz
Year 9	Term 1	9/10	1.14	Exploring Group 0	<ul style="list-style-type: none"> ● Explore the properties of noble gases. ● Find out how the mass of their atoms affects their boiling points. ● Relate their chemical properties to their electronic structures. 	4.1.2.4	Worksheet 1.14.1; Graph plotter 1.14.1; Presentations 1.14.1 and 1.14.2 'Group 0'	Quick starter Homework worksheet Homework quiz Slideshow
Year 9	Term 1	9/10	1.15	Exploring Group 1	<ul style="list-style-type: none"> ● Explore the properties of Group 1 metals. 	4.1.2.5	Worksheets 1.15.1, 1.15.2 and 1.15.3; Technician's	Quick starter Homework

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					<ul style="list-style-type: none"> ● Compare their reactivity. ● Relate their reactivity to their electronic structures. 		notes 1.14.1; Presentation 1.15.1	worksheet Homework quiz
Year 9	Term 1	11/12	1.16	Exploring Group 7	<ul style="list-style-type: none"> ● Explain why Group 7 non-metals are known as halogens. ● Compare their reactivity. ● Relate their reactivity to their electronic structures. 	4.1.2.6	Worksheets 1.16.1, 1.16.2 and 1.16.3; Technician's notes 1.16.1 and 1.16.2; Presentation 1.16.1	Quick starter Homework worksheet Homework quiz Slideshow
Year 9	Term 1	11/12	1.17	Reaction trends and predicting reactions	<ul style="list-style-type: none"> ● Review the patterns in the periodic table. ● Compare the trends in Group 1 and Group 7. ● Relate these trends to the way atoms form ions. 	4.1.2.1	Worksheet 1.17.1; Presentation 1.17.1	Quick starter Homework worksheet Homework quiz
Year 9	Term 1	11/12	1.18	Transition metals	<ul style="list-style-type: none"> ● Compare the properties of transition metals with those of Group 1 metals. ● Explore the uses of transition metals. ● Find out why they can form compounds with different colours. 	4.1.3.1, 4.1.3.2	Worksheet 1.18.1; Technician's notes 1.18.1; Presentation 1.18.1	Quick starter Homework worksheet Homework quiz Slideshow
Year 9	Term 1	11/12	1.19	Maths skills: Standard form and making estimates	<ul style="list-style-type: none"> ● Consider the sizes of particles. ● Use numbers in standard form to compare sizes. ● Use numbers in standard form in calculations. 		Worksheet 1.19.1; Technician's notes 1.19.1; Presentation 1.19.1	Homework quiz
Year 9	Term 2	13/14	Assessment	End of chapter test Student Book End of chapter test Collins Connect				
Chapter 2: Structure, bonding and the properties of matter								
Year 9	Term 2	13/14	2.1	Chemical bonds	<ul style="list-style-type: none"> ● Describe the three main types of bonding. ● Explain how electrons are used in the three main types of bonding. ● Explain how bonding and properties are linked. 	4.2.1.1	Worksheets 2.1.1 and 2.1.2	Quick starter Homework worksheet Homework quiz Homework quiz – higher tier

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Year 9	Term 2	13/14	2.2	Ionic bonding	<ul style="list-style-type: none"> ● Represent an ionic bond with a diagram. ● Draw dot and cross diagrams for ionic compounds. ● Work out the charge on the ions of metals from the group number of the element. 	4.2.1.2	Practical sheet 2.2.1; Worksheet 2.2.1; Technician's notes 2.2.1	Quick starter Homework worksheet Homework quiz Homework quiz – higher tier Video
Year 9	Term 2	15/16	2.3	Ionic compounds	<ul style="list-style-type: none"> ● Identify ionic compounds from structures. ● Explain the limitations of diagrams and models. ● Work out the empirical formula of an ionic compound. 	4.2.1.3	Practical sheet 2.3.1; Worksheets 2.3.1, 2.3.2 and 2.3.3; Technician's notes 2.3.1	Quick starter Homework worksheet Homework quiz Homework quiz – higher tier
Year 9	Term 2	15/16	2.4	Covalent bonding	<ul style="list-style-type: none"> ● Identify single bonds in molecules and structures. ● Draw dot and cross diagrams for small molecules. ● Deduce molecular formulae from models and diagrams. 	4.2.1.4	Worksheets 2.4.1 and 2.4.2	Quick starter Homework worksheet Homework quiz Video
Year 9	Term 2	15/16	2.5	Metallic bonding	<ul style="list-style-type: none"> ● Describe that metals form giant structures. ● Explain how metal ions are held together. ● Explain the delocalisation of electrons. 	4.2.1.5	Practical sheet 2.5.1; Worksheets 2.5.1 and 2.5.2; Technician's notes 2.5.1	Quick starter Homework worksheet Homework quiz Homework quiz – higher tier Video
Year 9	Term 2	17/18	2.6	Three states of matter	<ul style="list-style-type: none"> ● Use data to predict the states of substances. ● Explain the changes of state. ● Use state symbols in chemical equations. 	4.2.2.1, 4.2.2.2	Practical sheet 2.6.1; Worksheets 2.6.1 and 2.6.2; Technician's notes 2.6.1	Quick starter Homework worksheet Homework quiz Homework quiz – higher tier Slideshow Video
Year 9	Term 2	17/18	2.7	Properties of ionic compounds	<ul style="list-style-type: none"> ● Describe the properties of ionic compounds. ● Relate their melting points to forces between ions. ● Explain when ionic 	4.2.2.3	Practical sheets 2.7.1 and 2.7.2; Worksheet 2.7.1; Technician's notes 2.7.1 and 2.7.2	Quick starter Homework worksheet Homework quiz Homework quiz – higher tier

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					compounds can conduct electricity.			Video
Year 9	Term 2	17/18	2.8	Properties of small molecules	<ul style="list-style-type: none"> Identify small molecules from formulae. Explain the strength of covalent bonds. Relate the intermolecular forces to the bulk properties of a substance. 	4.2.2.4	Worksheets 2.8.1 and 2.8.2	Quick starter Homework worksheet Homework quiz Homework quiz – higher tier Video
Year 9	Term 2	19/20	2.9	Polymer structures	<ul style="list-style-type: none"> Recognise polymers from their unit formulae. Explain why some polymers can stretch. Explain why some plastics do not soften on heating. 	4.2.2.5	Practical sheet 2.9.1; Worksheet 2.9.1; Technician's notes 2.9.1	Quick starter Homework worksheet Homework quiz Homework quiz – higher tier
Year 9	Term 2	19/20	2.10	Giant covalent structures	<ul style="list-style-type: none"> Recognise giant covalent structures from diagrams. Explain the properties of giant covalent structures. Recognise the differences in different forms of carbon. 	4.2.2.6	Practical sheet 2.10.1; Worksheets 2.10.1 and 2.10.2; Technician's notes 2.10.1	Quick starter Homework worksheet Homework quiz
Year 9	Term 2	19/20	2.11	Properties of metals and alloys	<ul style="list-style-type: none"> Identify metal elements and their properties, and metal alloys. Describe the purpose of a tin-lead alloy. Explain why alloys have different properties to those of elements. 	4.2.2.7, 4.2.2.8	Practical sheet 2.11.1; Worksheets 2.11.1 and 2.11.2; Technician's notes 2.11.1	Quick starter Homework worksheet Homework quiz Slideshows
Year 9	Term 2	21/22	2.12	Diamond	<ul style="list-style-type: none"> Identify why diamonds are so hard. Explain how the properties relate to the bonding in diamond. Explain why diamond differs from graphite. 	4.2.3.1	Worksheet 2.12.1	Quick starter Homework worksheet Homework quiz Homework quiz – higher tier Slideshow Video
Year 9	Term 2	21/22	2.13	Graphite	<ul style="list-style-type: none"> Describe the structure and bonding of graphite. 	4.2.3.2	Worksheets 2.13.1 and 2.13.2	Quick starter Homework worksheet

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					<ul style="list-style-type: none"> ● Explain the properties of graphite. ● Explain the similarity to metals. 			Homework quiz Homework quiz – higher tier Video
Year 9	Term 2	23/24	2.14	Graphene and fullerenes	<ul style="list-style-type: none"> ● Describe the structure of graphene. ● Explain the structure and uses of the fullerenes. ● Explain the structure of nanotubes. 	4.2.3.3	Worksheets 2.14.1 and 2.14.2	Quick starter Homework worksheet Homework quiz Homework quiz – higher tier Video
Year 9	Term 2	23/24	2.15	Nanoparticles, their properties and uses	<ul style="list-style-type: none"> ● Relate the sizes of nanoparticles to atoms and molecules ● Explain that there may be risks associated with nanoparticles. ● Evaluate the use of nanoparticles for a specific purpose. 	4.2.4.1, 4.2.4.2	Worksheets 2.15.1, 2.15.2 and 2.15.3; Technician's notes 2.15.1	Quick starter Homework worksheet Homework quiz
Year 9	Term 2	23/24	2.16	Key concept: Sizes of particles and orders of magnitude	<ul style="list-style-type: none"> ● Identify the scale and measurements of length. ● Explain the conversion of small lengths to metres. ● Explain the relative sizes of electrons, nuclei and atoms. 		Practical sheet 2.16.1; Worksheets 2.16.1 and 2.16.2; Technician's notes 2.16.1	Quick starter Homework worksheet Homework quiz Slideshow Video
Year 9	Term 2	23/24	2.17	Maths skills: Visualise and represent 2D and 3D shapes	<ul style="list-style-type: none"> ● Use two-dimensional (2D) diagrams and 3D models to: <ul style="list-style-type: none"> ○ represent atoms, molecules and ionic structure ○ represent giant covalent structures ○ calculate empirical formulae of ionic structures. 		Worksheets 2.17.1, 2.17.2 and 2.17.3	
Year 9	Term 3	25/26	Assessment		End of chapter test Student Book End of chapter test Collins Connect End of teaching block test Collins Connect			
Chapter 3: Chemical quantities and calculations								
Year 9	Term 3	25/26	3.1	Key concept: Conservation of mass and balanced	<ul style="list-style-type: none"> ● Explore ideas about the conservation of mass. 	4.3.1.1	Worksheet 3.1.1; Technician's notes 3.1.1; Presentation 3.1.1	Quick starter Homework worksheet

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				equations	<ul style="list-style-type: none"> ● Consider what the numbers in equations stand for. ● Write balanced symbol equations. 			Homework quiz Slideshow Video
Year 9	Term 3	25/26	3.2	Relative formula mass	<ul style="list-style-type: none"> ● Review the differences between the isotopes of an element. ● Distinguish between the mass of an atom and the relative atomic mass of an element. ● Use relative atomic masses to calculate relative formula masses. 	4.3.1.2	Worksheets 3.2.1, 3.2.2 and 3.2.3; Technician's notes 3.2.1; Presentation 3.2.1	Quick starter Homework worksheet Homework quiz
Year 9	Term 3	27/28	3.3	Mass changes when gases are in reactions	<ul style="list-style-type: none"> ● Find out how mass can be gained or lost during a reaction. ● Find the mass of carbon dioxide released per gram of copper carbonate decomposed. ● Assess the accuracy of our measurements. 	4.3.1.3	Worksheet 3.3.1; Practical sheet 3.3.1; Technician's notes 3.3.1; Presentations 3.3.1 and 3.3.2; Graph Plotter 3.3.1	Quick starter Homework worksheet Homework quiz Slideshow
Year 9	Term 3	27/28	3.4	Chemical measurements and uncertainty	<ul style="list-style-type: none"> ● Explore ideas about the accuracy of measurements. ● Consider how closely measurements reflect true values. ● Explore ways of estimating the uncertainty in a set of measurements. 	4.3.1.4	Technician's notes 3.4.1; Presentation 3.4.1	Quick starter Homework worksheet Homework quiz
Year 9	Term 3	27/28	3.5	Moles	<ul style="list-style-type: none"> ● Describe the measurements of amounts of substances in moles. ● Calculate the amount of moles in a given mass of a substance. ● Calculate the mass of a given number of moles of a substance. 	4.3.2.1	Worksheets 3.5.1 and 3.5.2; Technician's notes 3.5.1	Quick starter Homework worksheet Homework quiz

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Year 9	Term 3	29/30	3.6	Amounts of substances in equations	<ul style="list-style-type: none"> ● Calculate the masses of substances in a balanced symbol equation. ● Calculate the masses of reactants and products from balanced symbol equations. ● Calculate the mass of a given reactant or product. 	4.3.2.2	Worksheet 3.6.1	Quick starter Homework worksheet Homework quiz Slideshow
Year 9	Term 3	29/30	3.7	Using moles to balance equations	<ul style="list-style-type: none"> ● Convert masses in grams to amounts in moles. ● Balance an equation given the masses of reactants and products. ● Change the subject of a mathematical equation. 	4.3.2.3, 4.3.2.4	Worksheet 3.7.1	Quick starter Homework worksheet Homework quiz
Year 9	Term 3	29/30	3.8	Concentration of solutions	<ul style="list-style-type: none"> ● Relate mass, volume and concentration. ● Calculate the mass of solute in solution. ● Relate concentration in mol/dm³ to mass and volume. 	4.3.2.5	3.8.1, Worksheet 3.8.1, Technician's notes 3.8.1	Quick starter Homework worksheet Homework quiz
Year 9	Term 3	31/32	3.9	Key concept: Percentage yield	<ul style="list-style-type: none"> ● Calculate the percentage yield from the actual yield. ● Identify the balanced equation needed for calculating yields. ● Calculate theoretical product amounts from reactant amounts. 	4.3.3.1	Practical sheet 3.9.1; Worksheet 3.9.1; Technician's notes 3.9.1	Quick starter Homework worksheet Homework quiz Video
Year 9	Term 3	31/32	3.10	Atom economy	<ul style="list-style-type: none"> ● Identify the balanced equation of a reaction. ● Calculate the atom economy of a reaction to form a product. ● Explain why a particular reaction pathway is chosen. 	4.3.3.2	Worksheets 3.10.1 and 3.10.2	Quick starter Homework worksheet Homework quiz Homework quiz – higher
Year 9	Term 3	31/32	3.11	Using concentrations of	<ul style="list-style-type: none"> ● Describe how to carry out titrations. 	4.3.4	Practical sheet 3.11.1, Worksheet 3.11.1	Quick starter Homework

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				solutions	<ul style="list-style-type: none"> • Calculate concentrations in titrations in mol/dm³ and in g/dm³. • Explain how the concentration of a solution in mol/dm³ is related to the mass of the mass of the solute and the volume of the solution. 		Technician's notes 3.11.1	worksheet Homework quiz Homework quiz – higher Slideshow	
Year 9	Term 3	33/34	3.12	Amounts of substance in volumes of gases	<ul style="list-style-type: none"> • Explain that the same amount of any gas occupies the same volume at room temperature and pressure (rtp). • Calculate the volume of a gas at rtp from its mass and relative formula mass. • Calculate the volumes of gases from a balanced equation and a given volume of a reactant or product. 	4.3.5	Practical sheet 3.12.1; Worksheet 3.12.1; Technician's notes 3.12.1	Quick starter Homework worksheet Homework quiz Video	
Year 9	Term 3	33/34	3.13	Key concept: Amounts in chemistry	<ul style="list-style-type: none"> • Use atomic masses to calculate formula masses. • Explain how formula mass relates to the number of moles. • Explain how the number of moles relates to other quantities. 		Worksheets 3.13.1 and 3.13.2	Quick starter Homework worksheet Homework quiz Homework quiz – higher Slideshow Video	
Year 9	Term 3	33/34	3.14	Maths skills: Change the subject of an equation	<ul style="list-style-type: none"> • Use equations to demonstrate conservation. • Rearrange the subject of an equation. • Carry out multi-step calculations. 		Worksheet 3.14.1; PowerPoint 3.14.1	Quick starter Homework worksheet Homework quiz Video	
Year 9	Term 3	33/34	Assessment	End of chapter test Student Book End of chapter test Collins Connect					
Chapter 4: Chemical changes									
Year 9	Term 3	35/36	4.1	Metal oxides	<ul style="list-style-type: none"> • Explore what happens when 	4.4.1.1	Practical sheet 4.1.1;	Quick starter	

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					metals burn or corrode. <ul style="list-style-type: none"> Classify chemical changes as oxidation or reduction. Review the properties of metal oxides. 		Worksheets 4.1.1, 4.1.2 and 4.1.3; Presentation 4.1.1	Homework worksheet Homework quiz
Year 10	Term 1	35/36	4.2	Reactivity series	<ul style="list-style-type: none"> Compare the reactivity of metals. Observe some reactions between metal atoms and metal ions. Consider why some metals are more reactive than others. 	4.4.1.2	Practical sheet 4.2.1; Worksheet 4.2.1; Technician's notes 4.2.1; Presentations 4.2.1 and 4.2.2	Quick starter Homework worksheet Homework quiz Homework quiz – higher Slideshow
Year 10	Term 1	35/36	4.3	Extraction of metals	<ul style="list-style-type: none"> Find out where metals come from. Extract iron from its oxide using carbon. Consider how other metals are extracted from their ores. 	4.4.1.3	Practical sheet 4.3.1; Worksheet 4.3.1; Technician's notes 4.3.1; Presentation 4.3.1	Quick starter Homework worksheet Homework quiz Homework quiz – higher Slideshow
Year 10	Term 1	37/38	4.4	Oxidation and reduction in terms of electrons	<ul style="list-style-type: none"> Observe some reactions between metal atoms and metal ions. Learn to write ionic equations and half equations. Classify half equations as oxidation or reduction. 	4.4.1.4	Practical sheet 4.4.1; Worksheet 4.4.1; Technician's notes 4.4.1; Presentations 4.4.1 and 4.4.2	Quick starter Homework worksheet Homework quiz Homework quiz – higher
Year 10	Term 1	37/38	4.5	Reaction of metals with acids	<ul style="list-style-type: none"> React an acid and a metal to make a salt. Predict the formulas of salts. Write balanced symbol equations and half equations. 	4.4.2.1	Practical sheet 4.5.1; Worksheets 4.5.1 and 4.5.2; Technician's notes 4.5.1; Presentations 4.5.1 and 4.5.2	Quick starter Homework worksheet Homework quiz Homework quiz – higher
Year 10	Term 1	37/38	4.6	Neutralisation of acids and salt production	<ul style="list-style-type: none"> React an acid and an alkali to make a salt. Predict the formulas of salts. Write balanced symbol equations. 	4.4.2.2	Practical sheet 4.6.1; Worksheets 4.6.1 and 4.6.2; Technician's notes 4.6.1	Quick starter Homework worksheet Homework quiz Homework quiz – higher Video
Year 10	Term 1	39/40	4.7	Soluble salts	<ul style="list-style-type: none"> React an acid and a metal to 	4.4.2.3	Practical sheet 4.7.1;	Quick starter

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					<p>make a salt.</p> <ul style="list-style-type: none"> ● Predict the formulas of salts. ● Write balanced symbol equations and half equations. 		Worksheets 4.7.1 and 4.7.2; Technician's notes 4.7.1; Presentations 4.7.1 and 4.7.2	Homework worksheet Homework quiz Homework quiz – higher Video
Year 10	Term 1	39/40	4.8	Required practical: Preparing a pure, dry sample of a salt from an insoluble oxide or carbonate	<ul style="list-style-type: none"> ● React a carbonate with an acid to make a salt. ● Describe each step in the procedure. ● Determine the purity of the product. 		Practical sheet 4.8.1; Technician's notes 4.8.1; Presentations 4.8.1 and 4.8.2	Quick starter Homework worksheet Homework quiz Homework quiz – higher
Year 10	Term 1	39/40	4.9	pH and neutralisation	<ul style="list-style-type: none"> ● Estimate the pH of solutions. ● Identify weak and strong acids and alkalis. ● Investigate pH changes when a strong acid neutralises a strong alkali. 	4.4.2.4	Practical sheet 4.9.1; Worksheet 4.9.1; Technician's notes 4.9.1, 4.9.2 and 4.9.3; Presentation 4.9.1	Quick starter Homework worksheet Homework quiz
Year 10	Term 1	41/42	4.10	Required practical: Finding the reacting volumes of acid and alkali by titration	<ul style="list-style-type: none"> ● Use an acid to neutralise a known volume of alkali. ● Use a burette to determine the volume of an acid needed. ● Use the results to determine the concentration of an alkali. 	4.4.2.5	Practical sheet 4.10.1; Technician's notes 4.10.1; Presentations 4.10.1 and 4.10.2	Quick starter Homework worksheet Homework quiz Homework quiz – higher
Year 10	Term 1	41/42	4.11	Strong and weak acids	<ul style="list-style-type: none"> ● Explore the factors that affect the pH of an acid. ● Find out how the pH changes when an acid is diluted. ● Find out how the concentrations of solutions are measured. 	4.4.2.6	Worksheet 4.11.1; Presentation 4.11.1	Quick starter Homework worksheet Homework quiz Video
Year 10	Term 1	41/42	4.12	The process of electrolysis	<ul style="list-style-type: none"> ● Explore what happens when a current passes through a solution of ions. ● Find out what an electrolyte is and what happens when it conducts electricity. ● Find out how electricity 	4.4.3.1	Practical sheet 4.12.1; Worksheet 4.12.1; Technician's notes 4.12.1; Presentation 4.12.1	Quick starter Homework worksheet Homework quiz Homework quiz – higher Slideshow Video

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					decomposes compounds.			
Year 10	Term 1	43/44	4.13	Electrolysis of molten ionic compounds	<ul style="list-style-type: none"> ● Look in detail at the electrolysis of lead bromide. ● Communicate the science behind the extraction of elements from molten salts. ● Write balanced half equations for electrolysis reactions. 	4.4.3.2	Worksheet 4.13.1; Presentation 4.13.1	Quick starter Homework worksheet Homework quiz Homework quiz – higher
Year 10	Term 1	43/44	4.14	Using electrolysis to extract metals	<ul style="list-style-type: none"> ● Review the connection between the reactivity series and the ways metals are extracted. ● Consider how aluminium is extracted from aluminium oxide. ● Learn the oxidation and reduction reactions involved. 	4.4.3.3	Worksheet 4.14.1; Presentations 4.14.1 and 4.14.2	Quick starter Homework worksheet Homework quiz Homework quiz – higher Slideshow
Year 10	Term 1	43/44	4.15	Electrolysis of aqueous solutions	<ul style="list-style-type: none"> ● Investigate the products formed when copper sulfate is electrolysed ● Predict what products other solutions will give ● Write half equations for reactions at electrodes 	4.4.3.4, 4.4.3.5	Practical sheet 4.15; Technician's notes 4.15.1; Presentation 4.15.1	Quick starter Homework worksheet Homework quiz
Year 10	Term 1	45/46	4.16	Required practical: Investigating what happens when aqueous solutions are electrolysed using inert electrodes	<ul style="list-style-type: none"> ● Devise a hypothesis. ● Devise an investigation to test your hypothesis. ● Decide whether the evidence supports your hypothesis. 		Practical sheet 4.16.1; Technician's notes 4.16.1; Presentations 4.16.1 and 4.16.2	Quick starter Homework worksheet Homework quiz Homework quiz – higher
Year 10	Term 1	45/46	4.17	Key concept: Electron transfer, oxidation and reduction	<ul style="list-style-type: none"> ● Review ion formation. ● Classify half equations as oxidation or reduction. ● Review patterns in reactivity. 		Worksheet 4.17.1; Presentation 4.17.1	Quick starter Homework worksheet Homework quiz Video

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Year 10	Term 1	45/46	4.18	Maths skills: Make order of magnitude calculations	<ul style="list-style-type: none"> ● Explore the factors that affect the acidity of rain. ● Find out how acid concentrations are compared. ● Explore the link between hydrogen ion concentration and pH. 		Practical sheet 4.18.1; Technician's notes 4.18.1; Presentation 4.18.1	
Year 10	Term 1	45/46	Assessment	End of chapter test Student Book End of chapter test Collins Connect End of teaching block test Collins Connect				
Chapter 5: Energy changes								
Year 10	Term 1	47/48	5.1	Key concept: Endothermic and exothermic reactions	<ul style="list-style-type: none"> ● Explore the temperature changes produced by chemical reactions. ● Consider how reactions are used to heat or cool their surroundings. ● Investigate how these temperature changes can be controlled. 	4.5.1.1, 4.5.1.2, 4.5.1.3	Practical sheet 5.1.1; Worksheet 5.1.1; Technician's notes 5.1.1; Graph plotters 5.1.1, 5.1.2, 5.1.3 and 5.1.4	Quick starter Homework worksheet Homework quiz Slideshow
Year 10	Term 1	47/48	5.2	Required practical: Investigate the variables that affect temperature changes in reacting solutions, such as acid plus metals, acid plus carbonates, neutralisations, displacement of metals	<ul style="list-style-type: none"> ● Devise a hypothesis. ● Devise an investigation to test your hypothesis. ● Decide whether the evidence supports your hypothesis. 		Practical sheet 5.2.1; Technician's notes 5.2.1; Presentation 5.2.1	Quick starter Homework worksheet Homework quiz Homework quiz – higher
Year 10	Term 1	47/48	5.3	Reaction profiles	<ul style="list-style-type: none"> ● Use diagrams to show the energy changes during reactions. ● Show the difference between exothermic and endothermic reactions using energy profiles. ● Find out why many reactions 	4.5.1.2	Worksheets 5.3.1 and 5.3.2; Technician's notes 5.3.1; Presentation 5.3.1	Quick starter Homework worksheet Homework quiz Homework quiz – higher Video

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					start only when energy or a catalyst is added.			
Year 10	Term 2	49/50	5.4	Energy change of reactions	<ul style="list-style-type: none"> Identify the bonds broken and formed during a chemical reaction. Consider why some reactions are exothermic and others are endothermic. Use bond energies to calculate overall energy changes. 	4.5.1.3	Worksheets 5.4.1 and 5.4.2; Technician's notes 5.4.1; Presentation 5.4.1	Quick starter Homework worksheet Homework quiz
Year 10	Term 2	49/50	5.5	Cells and batteries	<ul style="list-style-type: none"> Make simple cells and measure their voltages. Consider the importance of cells and batteries. Find out how larger voltages can be produced. 	4.5.2.1	Practical sheet 5.5.1; Worksheets 5.5.1 and 5.5.2; Technician's notes 5.5.1	Quick starter Homework worksheet Homework quiz Homework quiz – higher Slideshows
Year 10	Term 2	49/50	5.6	Fuel cells	<ul style="list-style-type: none"> Find out how fuel cells work. Compare and contrast the uses of hydrogen fuel cells, batteries and rechargeable cells. Learn what reactions take place inside hydrogen fuel cells. 	4.5.2.2	Worksheet 5.6.1; Technician's notes 5.6.1; Presentations 5.6.1 and 5.6.2	Quick starter Homework worksheet Homework quiz Video
Year 10	Term 2	49/50	5.7	Maths skills: Recognise and use expressions in decimal form	<ul style="list-style-type: none"> Read scales in integers and using decimals. Calculate the energy change during a reaction. Calculate energy transferred for comparison. 		Practical sheet 5.7.1; Worksheet 5.7.1; Technician's notes 5.7.1; Presentation 5.7.1	Quick starter Homework worksheet Homework quiz
Year 10	Term 2	51/52	Assessment		End of chapter test Student Book End of chapter test Collins Connect			
Chapter 6: The rate and extent of chemical change								
Year 10	Term 2	51/52	6.1	Measuring rates	<ul style="list-style-type: none"> Measure the volume of gas given off during a reaction. Use the results to measure the reaction rate. 	4.6.1.1	Practical sheet 6.1.1; Worksheet 6.1.1; Technician's notes 6.1.1; Presentations 6.1.1 and 6.1.2; Graph plotter 6.1.1	Quick starter Homework worksheet Homework quiz Homework quiz

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					<ul style="list-style-type: none"> ● Explore how the rate changes during the reaction. 			– higher
Year 10	Term 2	51/52	6.2	Key concept: Limiting reactants and molar masses	<ul style="list-style-type: none"> ● Recognise when one reactant is in excess. ● Consider how this affects the amount of product made. ● Explore ways of increasing the amount of product. 	4.3.2.4	Practical sheet 6.2.1; Worksheets 6.2.1 and 6.2.2; Technician's notes 6.2.1; Presentation 6.2.1	Quick starter Homework worksheet Homework quiz Slideshow Video
Year 10	Term 2	53/54	6.3	Calculating rates	<ul style="list-style-type: none"> ● Find out how to calculate rates of reaction. ● Use graphs to compare reaction rates. ● Use tangents to measure rates that change. 	4.6.1.1	Practical sheet 6.3.1; Worksheet 6.3.1; Technician's notes 6.3.1; Presentations 6.3.1 and 6.3.2	Quick starter Homework worksheet Homework quiz Homework quiz – higher
Year 10	Term 2	53/54	6.4	Factors affecting rates	<ul style="list-style-type: none"> ● Measure the time taken to produce a specific amount of product. ● See how a reactant's temperature or concentration can affect this time. ● Investigate the effect of breaking up a solid reactant into smaller pieces. 	4.6.1.2	Practical sheet 6.4.1; Worksheets 6.4.1 and 6.4.2; Technician's notes 6.4.1; Presentation 6.4.1; Graph plotter 6.4.1	Quick starter Homework worksheet Homework quiz Homework quiz – higher Video
Year 10	Term 2	53/54	6.5	Required practical: Investigate how changes in concentration affect the rates of reactions by a method involving the production of a gas and a method involving a colour change	<ul style="list-style-type: none"> ● Devise a hypothesis. ● Devise an investigation to test a hypothesis. ● Decide whether the evidence supports a hypothesis. 		Practical sheets 6.5.1 and 6.5.2; Worksheet 6.5.1; Technician's notes 6.5.1; Presentations 6.5.1 and 6.5.2; Graph plotters 6.5.1 and 6.5.2	Quick starter Homework worksheet Homework quiz Homework quiz – higher
Year 10	Term 2	55/56	6.6	Factors increasing the rate	<ul style="list-style-type: none"> ● Interpret graphs. ● Consider what determines the reaction rate. ● Explore the effect of changing the amounts of reactants used. 	4.6.1.4	Practical sheet 6.6.1; Worksheet 6.6.1; Technician's notes 6.6.1; Presentation 6.6.1	Quick starter Homework worksheet Homework quiz Homework quiz – higher

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								Slideshow
Year 10	Term 2	55/56	6.7	Collision theory	<ul style="list-style-type: none"> Find out about the collision theory. Use collision theory to make predictions about reaction rates. Relate activation energies to collision theory. 	4.6.1.3	Worksheets 6.7.1 and 6.7.2; Presentations 6.7.1 and 6.7.2	Quick starter Homework worksheet Homework quiz Homework quiz – higher
Year 10	Term 2	55/56	6.8	Catalysts	<ul style="list-style-type: none"> Investigate catalysts. Find out how catalysts work. Learn how they affect activation energy. 	4.6.1.5	Practical sheet 6.8.1; Worksheet 6.8.1; Technician's notes 6.8.1	Quick starter Homework worksheet Homework quiz Homework quiz – higher Video
Year 10	Term 2	57/58	6.9	Reversible reactions and energy changes	<ul style="list-style-type: none"> Investigate reversible reactions. Explore the energy changes in a reversible reaction. Find out how reaction conditions affect reversible reactions. 	4.6.2.1, 4.6.2.2	Practical sheet 6.9.1; Worksheet 6.9.1; Technician's notes 6.9.1; Presentation 6.9.1	Quick starter Homework worksheet Homework quiz Homework quiz – higher
Year 10	Term 2	57/58	6.10	Equilibrium	<ul style="list-style-type: none"> Recognise reactions that can reach equilibrium. Find out what happens to the reactants and products at equilibrium. Use Le Chatelier's principle to make predictions. 	4.6.2.3	Worksheets 6.10.1; Technician's notes 6.10.1; Presentation 6.10.1	Quick starter Homework worksheet Homework quiz
Year 10	Term 2	57/58	6.11	Changing concentration and equilibrium	<ul style="list-style-type: none"> Distinguish between reactants and products. Explore how changing their concentrations affects reversible reactions. Use Le Chatelier's principle to make predictions about changing concentrations. 	4.6.2.4, 4.6.2.5	Worksheet 6.11.1; Technician's notes 6.11.1; Presentation 6.11.1	Quick starter Homework worksheet Homework quiz
Year 10	Term 2	59/60	6.12	Changing temperature and equilibrium	<ul style="list-style-type: none"> Distinguish between exothermic and endothermic forward reactions. 	4.6.2.6	Worksheets 6.12.1 and 6.12.2; Technician's 6.12.1; Presentation 6.12.1	Quick starter Homework worksheet

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					<ul style="list-style-type: none"> ● Explore how changing the temperature affects reversible reactions. ● Use Le Chatelier's principle to make predictions about changing temperatures. 			Homework quiz
Year 10	Term 2	59/60	6.13	Changing pressure and equilibrium	<ul style="list-style-type: none"> ● Recognise the number of product and reactant molecules in a reaction. ● Explore how changing the pressure affects reversible reactions. ● Use Le Chatelier's principle to make predictions about changing pressures. 	4.6.2.6	Worksheet 6.13.1; Presentation 6.13.1	Quick starter Homework worksheet Homework quiz
Year 10	Term 2	59/60	6.14	Maths skills: Use the slope of a tangent as a measure of rate of change	<ul style="list-style-type: none"> ● Practice drawing graphs. ● Use graphs to compare reaction rates. ● Use tangents to measure rates that change. 		Worksheets 6.14.1 and 6.14.2; Presentations 6.14.1 and 6.14.2	Video
Year 10	Term 2	59/60	Assessment		End of chapter test Student Book End of chapter test Collins Connect End of teaching block test Collins Connect			
Chapter 7: Hydrocarbons								
Year 10	Term 3	61/62	7.1	Crude oil, hydrocarbons and alkanes	<ul style="list-style-type: none"> ● Describe why crude oil is a finite resource. ● Identify the hydrocarbons in the series of alkanes. ● Explain the structure and formulae of the alkanes. 	4.7.1.1	Worksheets 7.1.1 and 7.1.2	Quick starter Homework worksheet Homework quiz Video
Year 10	Term 3	61/62	7.2	Fractional distillation and petrochemicals	<ul style="list-style-type: none"> ● Describe how crude oil is used to provide modern materials. ● Explain how crude oil is separated by fractional distillation. ● Explain why the boiling points of the fractions are different. 	4.7.1.2	Practical sheet 7.2.1; Worksheets 7.2.1 and 7.2.2; Technician's notes 7.2.1	Quick starter Homework worksheet Homework quiz Homework quiz – higher Video

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Year 10	Term 3	61/62	7.3	Properties of hydrocarbons	<ul style="list-style-type: none"> Describe how different hydrocarbon fuels have different properties. Identify the properties that influence the use of fuels. Explain how the properties are related to the size of the molecules. 	4.7.1.3	Worksheets 7.3.1 and 7.3.2	Quick starter Homework worksheet Homework quiz Video
Year 10	Term 3	63/64	7.4	Combustion	<ul style="list-style-type: none"> Describe the process of complete combustion. Balance equations showing the combustion of hydrocarbons. Explain the consequences of incomplete combustion. 	4.7.1.3	Practical sheet 7.4.1; Worksheet 7.4.1; Technician's notes 7.4.1	Quick starter Homework worksheet Homework quiz
Year 10	Term 3	63/64	7.5	Cracking and alkenes	<ul style="list-style-type: none"> Describe the usefulness of cracking. Balance chemical equations as examples of cracking. Explain why modern life depends on the uses of hydrocarbons. 	4.7.1.4	Practical sheet 7.5.1; Worksheet 7.5.1; Technician's notes 7.5.1	Quick starter Homework worksheet Homework quiz
Year 10	Term 3	63/64	7.6	Structure and formulae of alkenes	<ul style="list-style-type: none"> Describe the difference between an alkane and an alkene. Draw the displayed structural formulae for the first four members of the alkenes. Explain why alkenes are called unsaturated molecules. 	4.7.2.1	Worksheets 7.6.1 and 7.6.2	Quick starter Homework worksheet Homework quiz Video
Year 10	Term 3	65/66	7.7	Reactions of alkenes	<ul style="list-style-type: none"> Describe the addition reactions of alkenes. Draw the full displayed structural formulae of the products alkenes make. Explain how alkenes react with hydrogen, water and the halogens. 	4.7.2.2	Practical sheet 7.7.1; Worksheets 7.7.1 and 7.7.2; Technician's notes 7.7.1	Quick starter Homework worksheet Homework quiz

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Year 10	Term 3	65/66	7.8	Alcohols	<ul style="list-style-type: none"> ● Recognise alcohols from their name or from given formulae. ● Describe the conditions used for the fermentation of sugar using yeast. ● Write balanced chemical equations for the combustion of alcohols. 	4.7.2.3	Practical sheets 7.8.1 and 7.8.2; Worksheets 7.8.1 and 7.8.2; Technician's notes 7.8.1	Quick starter Homework worksheet Homework quiz Video
Year 10	Term 3	65/66	7.9	Carboxylic acids	<ul style="list-style-type: none"> ● Describe the reactions of carboxylic acids. ● Recognise carboxylic acids from their formulae. ● Explain the reaction of ethanoic acid with an alcohol. 	4.7.2.4	Practical sheet 7.9.1; Worksheets 7.9.1 and 7.9.2; Technician's notes 7.9.1	Quick starter Homework worksheet Homework quiz
Year 10	Term 3	67/68	7.10	Addition polymerisation	<ul style="list-style-type: none"> ● Recognise addition polymers and monomers from diagrams. ● Draw diagrams of the formation of a polymer from an alkene. ● Relate the repeating unit of the polymer to the monomer. 	4.7.3.1	Worksheets 7.10.1 and 7.10.2	Quick starter Homework worksheet Homework quiz
Year 10	Term 3	67/68	7.11	Condensation polymerisation	<ul style="list-style-type: none"> ● Explain the basic principles of condensation polymerisation. ● Explain the role of functional groups in producing a condensation polymer. ● Explain the structure of the repeating units in a condensation polymer. 	4.7.3.2	Practical sheet 7.11.1; Worksheets 7.11.1 and 7.11.2; Technician's notes 7.11.1	Quick starter Homework worksheet Homework quiz
Year 10	Term 3	67/68	7.12	Amino acids	<ul style="list-style-type: none"> ● Describe the functional group of an amine. ● Identify the two functional groups of an amino acid. ● Explain how different amino acids build proteins. 	4.7.3.3	Worksheet 7.12.1	Quick starter Homework worksheet Homework quiz
Year 10	Term 3	69/70	7.13	DNA and other	<ul style="list-style-type: none"> ● Describe the components of 	4.7.3.4	Worksheets 7.13.1 and 7.13.2	Quick starter

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				naturally occurring polymers	natural polymers. <ul style="list-style-type: none"> ● Explain the structure of proteins and carbohydrates. ● Explain how a molecule of DNA is constructed. 			Homework worksheet Homework quiz
Year 10	Term 3	69/70	7.14	Key concept: Intermolecular forces	<ul style="list-style-type: none"> ● Identify the bonds within a molecule and the forces between molecules. ● Explain changes of state. ● Explain how polymer structure determines its ability to stretch. 		Worksheets 7.14.1 and 7.14.2	Quick starter Homework worksheet Homework quiz Video
Year 10	Term 3	69/70	7.15	Maths skills: Visualise and represent 3D models	<ul style="list-style-type: none"> ● Use three-dimensional (3D) models to represent hydrocarbons, polymers and large biological molecules. 		Worksheets 7.15.1 and 7.15.2	
Year 10	Term 3	71/72	Assessment		End of chapter test Student Book End of chapter test Collins Connect			
Chapter 8: Chemical analysis								
Year 10	Term 3	71/72	8.1	Key concepts: Pure substances	<ul style="list-style-type: none"> ● Describe, explain and exemplify processes of separation. ● Suggest separation and purification techniques for mixtures. ● Distinguish pure and impure substances using melting point and boiling point data. 	4.1.1.2, 4.8.1.1	Practical sheets 8.1.1 and 8.1.2; Worksheets 8.1.1 and 8.1.2; Technician's notes 8.1.1 and 8.1.2	Quick starter Homework worksheet Homework quiz
Year 10	Term 3	71/72	8.2	Formulations	<ul style="list-style-type: none"> ● Identify formulations given appropriate information. ● Explain the particular purpose of each chemical in a mixture. ● Explain how quantities are carefully measured for formulation. 	4.8.1.2	Worksheets 8.2.1 and 8.2.2	Quick starter Homework worksheet Homework quiz
Year 10	Term 3	71/72	8.3	Chromatography	<ul style="list-style-type: none"> ● Explain how to set up chromatography paper. 	4.8.1.4, 4.8.1.4	Practical sheet 8.3.1, Worksheet 8.3.1, Technician's notes 8.3.1	Quick starter Homework worksheet

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					<ul style="list-style-type: none"> ● Distinguish pure from impure substances. ● Interpret chromatograms and calculate R_f values. 			Homework quiz Homework quiz – higher Video
Year 11	Term 1	73/74	8.4	Required practical: Investigate how paper chromatography can be used in forensic science to identify an ink mixture used in a forgery	<ul style="list-style-type: none"> ● Describe the safe and correct manipulation of chromatography apparatus and how accurate measurements are achieved. ● Make and record measurements used in paper chromatography. ● Calculate R_f values. 		Practical sheets 8.4.1 and 8.4.2; Technician's notes 8.4.1	Quick starter Homework worksheet Homework quiz
Year 11	Term 1	73/74	8.5	Test for gases	<ul style="list-style-type: none"> ● Recall the tests for four common gases. ● Identify the four common gases using these tests. ● Explain why limewater can be used to detect carbon dioxide. 	4.8.2.1, 4.8.2.2, 4.8.2.3, 4.8.2.4	Practical sheet 8.5.1; Technician's notes 8.5.1	Quick starter Homework worksheet Homework quiz
Year 11	Term 1	73/74	8.6	Flame tests	<ul style="list-style-type: none"> ● Carry out flame-test procedures. ● Identify the colours of flames of ions. ● Identify species from the results of the tests. 	4.8.3.1	Practical sheet 8.6.1; Worksheet 8.6.1; Technician's notes 8.6.1	Quick starter Homework worksheet Homework quiz
Year 11	Term 1	75/76	8.7	Metal hydroxides	<ul style="list-style-type: none"> ● Recognise the precipitate colour of metal hydroxides. ● Explain how to use sodium hydroxide to test for metal ions. ● Write balanced equations for producing insoluble metal hydroxides. 	4.8.3.2	Practical sheet 8.7.1; Worksheet 8.7.1; Technician's notes 8.7.1	Quick starter Homework worksheet Homework quiz Homework quiz – higher Slideshow
Year 11	Term 1	75/76	8.8	Tests for anions	<ul style="list-style-type: none"> ● Identify the tests for carbonates. ● Explain the tests for halides and sulfates. ● Identify anions and cations 	4.8.3.3, 4.8.3.4, 4.8.3.5	Practical sheets 8.8.1 and 8.8.2; Worksheet 8.8.1; Technician's notes 8.8.1 and 8.8.2	Quick starter Homework worksheet Homework quiz

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					from the results of tests.				
Year 11	Term 1	75/76	8.9	Required practical: Use chemical tests to identify the ions in unknown single ionic compounds	<ul style="list-style-type: none"> Describe how to carry out experiments safely using the correct manipulation of apparatus for the qualitative analysis of ions. Make and record observations using flame tests and precipitation methods. Identify unknown ions in chemical compounds. 		Practical sheets 8.9.1 and 8.9.2, Technician's notes 8.9.1	Quick starter Homework worksheet Homework quiz	
Year 11	Term 1	77/78	8.10	Instrumental methods	<ul style="list-style-type: none"> Identify advantages of instrumental methods compared with the chemical tests. Describe some instrumental techniques. Explain the data provided by instrumental techniques. 	4.8.3.6	Worksheets 8.10.1 and 8.10.2	Quick starter Homework worksheet Homework quiz Slideshow Video	
Year 11	Term 1	77/78	8.11	Flame emission spectroscopy	<ul style="list-style-type: none"> Describe flame emission spectroscopy. Identify the advantages of instrumental methods compared with the chemical tests. Interpret an instrumental result using a reference set. 	4.8.3.6	Practical sheet 8.11.1; Worksheet 8.11.1; Technician notes 8.11.1	Quick starter Homework worksheet Homework quiz Video	
Year 11	Term 1	77/78	8.12	Maths skills: Use an appropriate number of significant figures	<ul style="list-style-type: none"> Measure distances on chromatograms Calculate R_f values Record R_f values to an appropriate number of significant figures 		Presentation 8.12.1	Quick starter Homework worksheet Homework quiz	
Year 11	Term 1	77/78	Assessment		End of chapter test Student Book End of chapter test Collins Connect End of teaching block test Collins Connect				
Chapter 9: The atmosphere									
Year 11	Term 1	79/80	9.1	Proportions of gases in the	<ul style="list-style-type: none"> Review the composition of the atmosphere. 	4.9.1.1	Worksheets 9.1.1 and 9.1.2; Technician's notes 9.1.1	Quick starter Homework	

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				atmosphere	<ul style="list-style-type: none"> ● Measure the percentage of oxygen in the atmosphere. ● Consider why it stays the same. 			worksheet Homework quiz Homework quiz – higher
Year 11	Term 1	79/80	9.2	The Earth's early atmosphere	<ul style="list-style-type: none"> ● Explore the origins of the Earth's atmosphere. ● Consider the evidence that ideas about the early atmosphere are based on. ● Consider the strength of the evidence these ideas are based on. 	4.9.1.2	Worksheet 9.2.1	Quick starter Homework worksheet Homework quiz Homework quiz – higher Video
Year 11	Term 1	79/80	9.3	How oxygen increased	<ul style="list-style-type: none"> ● Explore the processes that changed the oxygen concentration in the atmosphere. ● Consider the role of algae. ● Consider why oxygen levels in the atmosphere didn't rise when oxygen was first produced. 	4.9.1.3	Worksheet 9.3.1; Presentation 9.3.1	Quick starter Homework worksheet Homework quiz Homework quiz – higher Slideshow
Year 11	Term 1	81/82	9.4	How carbon dioxide decreased	<ul style="list-style-type: none"> ● Explore the processes that changed the amount of carbon dioxide in the atmosphere. ● Find out what ice cores tell us about the atmosphere. ● Explore how carbon dioxide levels have changed over time. 	4.9.1.4	Worksheet 9.4.1; Technician's notes 9.4.1; Presentations 9.4.1 and 9.4.2	Quick starter Homework worksheet Homework quiz
Year 11	Term 1	81/82	9.5	Key: concept: Greenhouse gases	<ul style="list-style-type: none"> ● Review the greenhouse effect. ● Explain how greenhouse gases trap heat. ● Consider the consequences of adding greenhouse gases to the atmosphere. 	4.9.2.1	Worksheet 9.5.1; Presentation 9.5.1	Quick starter Homework worksheet Homework quiz Homework quiz – higher
Year 11	Term 1	81/82	9.6	Human activities	<ul style="list-style-type: none"> ● Consider the factors that affect the quality of scientific 	4.9.2.2	Worksheet 9.6.1; Presentations 9.6.1 and	Quick starter Homework

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					<p>reports.</p> <ul style="list-style-type: none"> ● Consider the reliability of computer models. ● Find out what peer review involves. 		Presentation 9.6.2	<p>worksheet Homework quiz Homework quiz – higher Video</p>
Year 11	Term 1	83/84	9.7	Global climate change	<ul style="list-style-type: none"> ● Explore the consequences of climate change. ● Consider the risks to human health. ● Judge the seriousness of these consequences. 	4.9.2.3	Worksheet 9.7.1; Presentation 9.7.1	<p>Quick starter Homework worksheet Homework quiz Slideshow</p>
Year 11	Term 1	83/84	9.8	Carbon footprint and its reduction	<ul style="list-style-type: none"> ● Find out what a carbon footprint is. ● Consider factors that contribute to our carbon footprints. ● Explore ways of reducing our carbon footprints. 	4.9.2.4	Worksheet 9.8.1; Presentation 9.8.1	<p>Quick starter Homework worksheet Homework quiz Video</p>
Year 11	Term 1	83/84	9.9	Limitations on carbon footprint reduction	<ul style="list-style-type: none"> ● Review the uncertainties about carbon emissions. ● Consider factors which limit our ability to reduce our carbon footprints. ● Decide which factors are most important. 	4.9.2.4	Worksheets 9.9.1 and 9.9.2; Presentation 9.9.1	<p>Quick starter Homework worksheet Homework quiz</p>
Year 11	Term 2	85/86	9.10	Atmospheric pollutants from fuels	<ul style="list-style-type: none"> ● Explore the products formed when fuels burn. ● Distinguish between complete and incomplete combustion. ● Write equations for complete and incomplete combustion. 	4.9.3.1	Worksheets 9.10.1, 9.10.2, 9.10.3 and 9.10.4; Technician's notes 9.10.1; Presentation 9.10.1	<p>Quick starter Homework worksheet Homework quiz Homework quiz – higher Slideshow</p>
Year 11	Term 2	85/86	9.11	Properties and effects of atmospheric pollutants	<ul style="list-style-type: none"> ● Review the hazards associated with air pollutants. ● Investigate correlations between pollutant emissions and deaths from asthma. ● Consider whether these support the hypothesis that 	4.9.3.2	Worksheets 9.11.1 and 9.11.2; Presentations 9.11.1 and Presentation 9.11.2, Graph plotters 9.1.1 and 9.1.2	<p>Quick starter Homework worksheet Homework quiz Homework quiz – higher</p>

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					air pollution makes asthma worse.			
Year 11	Term 2	87/88	9.12	Maths skills: Use ratios, fractions and percentages	<ul style="list-style-type: none"> Consider ways of comparing the amounts of gases in the atmosphere. Review what balanced symbol equations show. Compare the yields in chemical reactions. 		Worksheet 9.12.1 and 9.12.2; Technician's notes 9.12.1; Presentation 9.12.1	Video
Year 11	Term 2	87/88	Assessment		End of chapter test Student Book End of chapter test Collins Connect			
Chapter 10: Sustainable development								
Year 11	Term 2	87/88	10.1	Key concept: Using the Earth's resources and sustainable development	<ul style="list-style-type: none"> Give examples of natural products replaced by synthetics. Give examples of products replaced by agricultural products. Distinguish between finite and renewable resources. 	4.10.1.1	Worksheets 10.1.1 and 10.1.2	Quick starter Homework worksheet Homework quiz Videos
Year 11	Term 2	87/88	10.2	Potable water	<ul style="list-style-type: none"> Distinguish between potable water and pure water. Describe the differences in treatment of ground water and salty water. Explain what is needed to provide potable water for all. 	4.10.1.2	Worksheets 10.2.1, 10.2.2 and 10.2.3; Technician's notes 10.2.1	Quick starter Homework worksheet Homework quiz Video
Year 11	Term 2	89/90	10.3	Required practical: Analysis and purification of water samples from different sources, including pH, dissolved solids and distillation	<ul style="list-style-type: none"> Describe how safety is managed, apparatus is used and accurate measurements are made. Recognise when sampling techniques need to be used and made representative. Carry out a procedure to produce potable water from salt solution. Evaluate methods and suggest possible 		Practical sheets 10.3.1 and 10.3.2; Worksheet 10.34.1; Technician's notes 10.3.1	Quick starter Homework worksheet Homework quiz

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					improvements and further investigations.			
Year 11	Term 2	89/90	10.4	Waste water treatment	<ul style="list-style-type: none"> ● Explain how waste water is treated. ● Describe how sewage is treated. ● Compare the ease of treating waste, ground and salt water. 	4.10.1.3	Worksheets 10.4.1, 10.4.2 and 10.4.3	Quick starter Homework worksheet Homework quiz Video
Year 11	Term 2	89/90	10.5	Alternative methods of metal extraction	<ul style="list-style-type: none"> ● Describe the process of phytomining. ● Describe the process of bioleaching. ● Evaluate alternative biological methods of metal extraction. 	4.10.1.4	Practical sheet 10.5.1; Worksheets 10.5.1 and 10.5.2; Technician's notes 10.5.1	Quick starter Homework worksheet Homework quiz
Year 11	Term 2	91/92	10.6	Life cycle assessment and recycling	<ul style="list-style-type: none"> ● Describe the components of a life cycle assessment (LCA). ● Interpret LCAs of materials or products from information. ● Carry out a simple comparative LCA for shopping bags. 	4.10.2.1	Worksheets 10.6.1 and 10.6.2	Quick starter Homework worksheet Homework quiz
Year 11	Term 2	91/92	10.7	Ways of reducing the use of resources	<ul style="list-style-type: none"> ● Describe ways of recycling and reusing materials. ● Explain why recycling, reusing and reducing are needed. ● Evaluate ways of reducing the use of limited resources. 	4.10.2.2	Worksheets 10.7.1 and 10.7.2	Quick starter Homework worksheet Homework quiz Video
Year 11	Term 2	91/92	10.8	Corrosion and its prevention	<ul style="list-style-type: none"> ● Show that air and water are needed for rusting. ● Describe experiments and interpret results on rusting. ● Explain methods for preventing corrosion. 	4.10.3.1	Practical sheets 10.8.1 and 10.8.2; Worksheets 10.8.1 and 10.8.2; Technician's notes 10.8.1 and 10.8.2	Quick starter Homework worksheet Homework quiz Video
Year 11	Term 2	93/94	10.9	Alloys as useful materials	<ul style="list-style-type: none"> ● Describe the composition of common alloys. ● Interpret the composition of 	4.10.3.2	Worksheets 10.9.1, 10.9.2 and 10.9.3	Quick starter Homework worksheet

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					<p>other alloys from data.</p> <ul style="list-style-type: none"> ● Evaluate the uses of other alloys. 			Homework quiz
Year 11	Term 2	93/94	10.10	Ceramics, polymers and composites	<ul style="list-style-type: none"> ● Compare quantitatively properties of materials. ● Compare glass, ceramics, polymers, composites and metals. ● Select materials by relating their properties to uses. 	4.10.3.3	Worksheets 10.10.1, 10.10.2 and 10.10.3	Quick starter Homework worksheet Homework quiz Video
Year 11	Term 2	93/94	10.11	Haber process	<ul style="list-style-type: none"> ● Apply principles of dynamic equilibrium to the Haber process. ● Use graphs to explain the trade off with rate and equilibrium. ● Explain how commercially used conditions relate to cost 	4.10.4.1	Practical sheet 10.11.1; Worksheets 10.11.1 and 10.11.2; Technician's notes 10.11.1	Quick starter Homework worksheet Homework quiz
Year 11	Term 2	95/96	10.12	Production and use of NPK fertilisers	<ul style="list-style-type: none"> ● Describe how to make a fertiliser in the laboratory. ● Explain how fertilisers are produced industrially. ● Compare the industrial production with laboratory preparation. 	4.10.4.2	Practical sheet 10.12.1; Worksheet 10.12.1; Technician's notes 10.12.1	Quick starter Homework worksheet Homework quiz
Year 11	Term 2	95/96	10.13	Maths skills: Translate information between graphical and numerical form	<ul style="list-style-type: none"> ● Represent information from pie charts numerically. ● Represent information from graphs numerically. ● Represent numeric information graphically. 		Worksheets 10.13.1 and 10.13.2	Quick starter Homework worksheet Homework quiz Video
Year 11	Term 2	95/96	Assessments		End of chapter test Student Book End of chapter test Collins Connect End of teaching block test Collins Connect End of course test Collins Connect			