Lesson number	Lesson title	Learning objectives	AQA specification reference	Lesson resources (on CD ROM)	Collins Connect resources
Chapter 1: Atomic structure and the periodic table					
1.1	Elements and compounds	• Identify symbols of elements from the periodic table. • Recognise compounds from their formula. • Identify the elements in a compound.	5.1.1.1	Worksheets 1.1.1 and 1.1.2 Practical sheet 1.1 Technician's notes 1.1	Quick starter Homework worksheet Homework quiz Slideshow
1.2	Atoms, formulae and equations	• Explain that an element consists of the same type of atoms. • Explain that atoms join together to make molecules. • Explain how formulae represent elements and compounds	5.1.1.1	Worksheets 1.2.1, 1.2.2 and 1.2.3 Practical sheet 1.2 Technician's notes 1.2 PowerPoint Presentation 1.2	Quick starter Homework worksheet Homework quiz Slideshow Video
1.3	Mixtures	• Recognise that all substances are chemicals. • Understand that all substances are either mixtures, compounds or elements. • Explain that mixtures can be separated.	5.1.1.2	Worksheets 1.3.1 and 1.3.2 Practical sheet 1.3 Technician's notes 1.3	Quick starter Homework worksheet Homework quiz
1.4	Changing ideas about atoms	• Describe how the atomic model has changed over time. • Explain why the atomic model has changed over time • Understand that a theory is provisional until the next piece of evidence is available.	5.1.1.3	Worksheets 1.4.1, 1.4.2 and 1.4.3 Technician's notes 1.4 PowerPoint Presentation 1.4	Quick starter Homework worksheet Homework quiz Video
1.5	Modelling the atom	• Describe the atom as a positively charged nucleus surrounded by negatively charged electrons. • Explain that most of the mass of an atom is in the nucleus. • Explain that the nuclear radius is much smaller than that of the atom and most of the mass is in the nucleus.	5.1.1.4	Worksheet 1.5 Technician's notes 1.5 PowerPoint Presentation 1.5 Graph plotter 1.5	Quick starter Homework worksheet Homework quiz
1.6	Relating charges and masses	• Describe the structure of atoms. • Recall the relative masses and charges of protons, neutrons and electrons. • Explain why atoms are neutral.	5.1.1.4	Worksheet 1.6 Technician's notes 1.6 PowerPoint Presentation 1.6	Quick starter Homework worksheet Homework quiz
1.7	Sub-atomic particles	• Use the definition of atomic number and mass number. • Calculate the numbers of protons, neutrons and electrons in *atoms*.	5.1.1.5 5.1.1.6	Worksheets 1.7.1 and 1.7.2 PowerPoint Presentation 1.7	Quick starter Homework worksheet Homework quiz Slideshow

Lesson number	Lesson title	Learning objectives	AQA specification reference	Lesson resources (on CD ROM)	Collins Connect resources
		• Calculate the numbers of sub-atomic particles in isotopes and ions.			
1.8	Electronic structure	• Explain how electrons occupy 'shells' in order. • Describe the pattern of the electrons in shells for the first 20 elements.	5.1.1.6	Worksheets 1.8.1, 1.8.2 and 1.8.3 Technician's notes 1.8	Quick starter Homework worksheet Homework quiz
1.9	The periodic table	• 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. • Explain that the electronic structure of transition metals position the elements into the transition metal block.	5.1.2.1	Worksheets 1.9.1, 1.9.2 and 1.9.3	Quick starter Homework worksheet Homework quiz Video
1.10	Developing the periodic table	• Describe the steps in the development of the periodic table. • Explain how Mendeleev left spaces for undiscovered elements. • Explain why the element order in the modern periodic table was changed. • Explain how testing a prediction can support or refute a new scientific idea.	5.1.2.2	Worksheets 1.10.1 and 1.10.2 Technician's notes 1.10 PowerPoint Presentation 1.10	Quick starter Homework worksheet Homework quiz
1.11	Comparing metals and non-metals	• Recall a number of physical properties of metals and non-metals. • Describe some chemical properties of metals and non-metals. • Explain the differences between metals and non-metals on the basis of their characteristic physical and chemical properties.	5.1.2.3	Worksheet 1.11 Practical sheet 1.11 Technician's notes 1.11 PowerPoint Presentations 1.11.1 and 1.11.2.2	Quick starter Homework worksheet Homework quiz
1.12	Metals and non-metals	• Describe that metals are found on the left of the periodic table and non-metals on the right. • Explain the differences between metals and non-metals based on their physical and chemical properties. • Explain that metals form positive ions and non-metals do not.	5.1.2.3	Worksheets 1.12.1 and 1.12.2	Quick starter Homework worksheet Homework quiz Video
1.13	Key concept: The outer electrons	• Recognise when electrons transfer • Recognise when atoms share electrons.		Worksheet 1.13 Technician's notes 1.13 PowerPoint Presentation 1.13	Quick starter Homework worksheet Homework quiz

Lesson number	Lesson title	Learning objectives	AQA specification reference	Lesson resources (on CD ROM)	Collins Connect resources
		• Predict when electrons are transferred most easily.			
1.14	Exploring Group 0	• Describe the unreactivity of the noble gases. • Predict and explain the trend in boiling point of the noble gases (going down the group). • Explain how properties of the elements in Group 0 depend on the outer shell of electrons of their atoms	5.1.2.4	Worksheet 1.14 Graph plotter 1.14.1 PowerPoint Presentations 1.14.1 and 1.14.2	Quick starter Homework worksheet Homework quiz Slideshow
1.15	Exploring Group 1	• Explain why Group 1 metals are known as the alkali metals. • Predict the properties of other Group 1 metals from trends down the group. • Relate the properties of the alkali metals to the number of electrons in their outer shell.	5.1.2.5	Worksheets 1.15.1, 1.15.2 and 1.15.3 Technician's notes 1.15 PowerPoint Presentation 1.15	Quick starter Homework worksheet Homework quiz
1.16	Exploring Group 7	• Recall that fluorine, chlorine, bromine and iodine are non-metals called halogens. • Describe that they react vigorously with alkali metals. • Construct balanced symbol equations for the reactions of metals with halogens.	5.1.2.6	Worksheets 1.16.1, 1.16.2 and 1.16.3 Technician's notes 1.16.1 and 1.16.2 PowerPoint Presentation 1.16	Quick starter Homework worksheet Homework quiz Slideshow
1.17	Reaction trends and predicting reactions	• Explain why the trends down the group in Group 1 and in Group 7 are different. • Explain the changes across a period. • Predict the reactions of elements with water, dilute acid or oxygen from their position in the periodic table.	5.1.2.1	Worksheet 1.17 PowerPoint Presentation 1.17	Quick starter Homework worksheet Homework quiz
1.18	Maths skills: Standard form and making estimates	• Recognise the format of standard form. • Convert decimals to standard form and vice versa. • Make estimates without calculators so the answer in standard form seems reasonable.		Worksheet 1.18 Technician's notes 1.18 PowerPoint Presentation 1.18	Quick starter Homework worksheet Homework quiz Video
Chapter 2: Structure, bonding and the properties of matter					
2.1	Chemical bonds	• Describe the three main types of bonding. • Explain how electrons are used in the three types of bonding. • Explain how bonding and properties are linked.	5.2.1.1	Worksheets 2.1.1 and 2.1.2	Quick starter Homework worksheet Homework quiz
2.2	Ionic bonding	• Represent an ionic bond with a diagram.	5.2.1.2	Worksheet 2.2	Quick starter

Lesson number	Lesson title	Learning objectives	AQA specification reference	Lesson resources (on CD ROM)	Collins Connect resources
		• Draw dot and cross diagrams for ionic compounds. • Work out the charge on the ions of metals and non-metals from the group number of the element (1, 2, 6 and 7).		Practical sheet 2.2 Technician's notes 2.2	Homework worksheet Homework quiz Video
2.3	Ionic compounds	• Identify ionic compounds from structures. • Explain the limitations of diagrams and models. • Work out the empirical formula of an ionic compound.	5.2.1.3	Worksheets 2.3.1, 2.3.2 and 2.3.3 Practical sheet 2.3 Technician's notes 2.3	Quick starter Homework worksheet Homework quiz
2.4	Covalent bonding	• Recognise substances made of small molecules from their formula. • Draw dot and cross diagrams for small molecules. • Deduce molecular formulae from models and diagrams.	5.2.1.4	Worksheets 2.4.1 and 2.4.2	Quick starter Homework worksheet Homework quiz Video
2.5	Metallic bonding	• Describe that metals form giant structures. • Explain how metal ions are held together. • Explain the delocalisation of electrons.	5.2.1.5	Worksheets 2.5.1 and 2.5.2 Practical sheet 2.5 Technician's notes 2.5	Quick starter Homework worksheet Homework quiz Video
2.6	Three states of matter	• Use data to predict the states of substances. • Explain the changes of state. • Use state symbols in chemical equations.	5.2.2.1, 5.2.2.2	Worksheets 2.6.1 and 2.6.2 Practical sheet 2.6 Technician's notes 2.6	Quick starter Homework worksheet Homework quiz Slideshow Video
2.7	Properties of ionic compounds	• Describe the properties of ionic compounds. • Relate their melting points to forces between ions. • Explain when ionic compounds can conduct electricity.	5.2.2.3	Worksheet 2.7 Practical sheets 2.7.1 and 2.7.2 Technician's notes 2.7.1 and 2.7.2	Quick starter Homework worksheet Homework quiz Video
2.8	Properties of small molecules	• Identify small molecules from formulae. • Explain the strength of covalent bonds. • Relate the intermolecular forces to the bulk properties of a substance.	5.2.2.4	Worksheets 2.8.1 and 2.8.2	Quick starter Homework worksheet Homework quiz Video
2.9	Polymer structures	• Identify polymers from diagrams showing their bonding and structure. • Explain why some polymers can stretch.	5.2.2.5	Worksheet 2.9 Practical sheet 2.9 Technician's notes 2.9	Quick starter Homework worksheet Homework quiz

Lesson number	Lesson title	Learning objectives	AQA specification reference	Lesson resources (on CD ROM)	Collins Connect resources
		• Explain why some plastics do not soften on heating.			
2.10	Giant covalent structures	• Recognise giant covalent structures from bonding and structure diagrams. • Explain the properties of giant covalent structures. • Recognise the differences in different forms of carbon.	5.2.2.6	Worksheets 2.10.1 and 2.10.2 Practical sheet 2.10 Technician's notes 2.10	Quick starter Homework worksheet Homework quiz
2.11	Properties of metals and alloys	• Identify metal elements and metal alloys. • Describe the purpose of a lead-tin alloy. • Explain why alloys are harder than pure metals due to the distortion of the layers of atoms.	5.2.2.7, 5.2.2.8	Worksheets 2.11.1 and 2.11.2 Practical sheet 2.11 Technician's notes 2.11	Quick starter Homework worksheet Homework quiz Slideshow 1 Slideshow 2
2.12	Diamond	• Identify why diamonds are so hard. • Explain how the properties relate to the bonding structure of diamond. • Explain why diamond differs from graphite.	5.2.3.1	Worksheet 2.12	Quick starter Homework worksheet Homework quiz Slideshow Video
2.13	Graphite	• Describe the structure and bonding of graphite. • Explain the properties of graphite. • Explain the similarity to metals.	5.2.3.2	Worksheets 2.13.1 and 2.13.2	Quick starter Homework worksheet Homework quiz Video
2.14	Graphene and fullerenes	• Explain the properties of graphene in terms of its structure and bonding. • Recognise graphene and fullerenes from their bonding and structure. • Describe the uses of fullerenes, including carbon nanotubes.	5.2.3.3	Worksheets 2.14.1 and 2.14.2	Quick starter Homework worksheet Homework quiz Video
2.15	Key concept: Sizes of particles and orders of magnitude	• Identify the scale of measurements of length. • Explain the conversion of small lengths to metres. • Explain the relative sizes of electrons, nuclei and atoms.		Worksheets 2.15.1 and 2.15.2 Practical sheet 2.15 Technician's notes 2.15	Quick starter Homework worksheet Homework quiz Slideshow Video
2.16	Maths skills: Visualise and represent 2D and 3D shapes	• Use 2D diagrams and 3D models to: ○ represent atoms, molecules and ionic structures ○ represent giant covalent structures ○ calculate empirical formulae of ionic structures.		Worksheets 2.16.1, 2.16.2 and 2.16.3	Quick starter Homework worksheet Homework quiz Video

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Chapter 3: Chemical quantities and calculations					
3.1	Key concept: Conservation of mass and balanced equations	• Explain the law of conservation of mass. • Explain why a multiplier appears as a subscript in a formula. • Explain why a multiplier appears in equations before a formula.	5.3.1.1	Worksheet 3.1 Technician's notes 3.1 PowerPoint Presentation 3.1	Quick starter Homework worksheet Homework quiz Slideshow Video
3.2	Relative formula mass	• Identify the relative atomic mass of an element from the periodic table. • Calculate the relative formula masses from atomic masses. • Verify the law of conservation of mass in a balanced equation.	5.3.1.2	Worksheets 3.2.1, 3.2.2 and 3.2.3 Technician's notes 3.2 PowerPoint Presentation 3.2	Quick starter Homework worksheet Homework quiz
3.3	Mass changes when gases are in reactions	• Explain any observed changes in mass in a chemical reaction. • Identify the mass changes using a balanced symbol equation. • Explain these changes in terms of the particle model.	5.3.1.3	Worksheet 3.3 Practical sheet 3.3 Technician's notes 3.3 PowerPoint Presentations 3.3.1 and 3.3.2 Graph Plotter 3.3	Quick starter Homework worksheet Homework quiz Slideshow
3.4	Chemical measurements and uncertainty	• Understand that all measurements have a degree of uncertainty. • Estimate the uncertainty from the distribution of results. • Measure uncertainty from the range of a set of measurements and their mean.	5.3.1.4	Technician's notes 3.4 PowerPoint Presentation 3.4	Quick starter Homework worksheet Homework quiz
3.5	Moles	• Describe the measurement of amounts of substances in moles. • Calculate the number of moles in a given mass. • Calculate the mass of a given number of moles.	5.3.2.1	Worksheets 3.5.1 and 3.5.2 Technician's notes 3.5	Quick starter Homework worksheet Homework quiz
3.6	Amounts of substances in equations	• 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.	5.3.2.2	Worksheet 3.6	Quick starter Homework worksheet Homework quiz Slideshow

Lesson number	Lesson title	Learning objectives	AQA specification reference	Lesson resources (on CD ROM)	Collins Connect resources
3.7	Using moles to balance equations	• 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.	5.3.2.3, 5.3.2.4	Worksheet 3.7	Quick starter Homework worksheet Homework quiz
3.8	Concentration of solutions	• Relate mass, volume and concentration. • Calculate the mass of solute in solution. • Relate concentration in mol/dm^3 to mass and volume.	5.3.2.5	Practical sheet 3.8 Technician's notes 3.8 Worksheet 3.8	Quick starter Homework worksheet Homework quiz
3.9	Key concept: Amounts in chemistry	• Use atomic masses to calculate formula mass. • Explain how formula mass relates to number of moles. • Explain how number of moles relate to other quantities.		Worksheets 3.9.1 and 3.9.2	Quick starter Homework worksheet Homework quiz Slideshow Video
3.10	Maths skills: Change the subject of an equation	• To use an equation to demonstrate conservation. • To change the subject of an equation. • To carry out a multi-step calculation.		Worksheet 3.10	Quick starter Homework worksheet Homework quiz Video
Chapter 4: Chemical changes					
4.1	Metal oxides	• Identify that metals react with oxygen to form metal oxides. • Explain oxidation by gain of oxygen. • Identify metal oxides as bases.	5.4.1.1	Worksheets 4.1.1, 4.1.2 and 4.1.3 Practical sheet 4.1 Technician's notes 4.1 PowerPoint Presentation 4.1	Quick starter Homework worksheet Homework quiz
4.2	Reactivity series	• Describe the reactions, if any, of metals with water or dilute acids. • Deduce an order of reactivity of metals based on experimental results. • Explain how the reactivity is related to the tendency of the metal to form its positive ion.	5.4.1.2	Worksheet 4.2 Practical sheet 4.2 Technician's notes 4.2 PowerPoint Presentations 4.2.1 and 4.2.2	Quick starter Homework worksheet Homework quiz Slideshow
4.3	Extraction of metals	• Identify substances reduced by loss of oxygen. • Explain how extraction methods depend on metal reactivity. • Interpret or evaluate information on specific metal extraction processes.	5.4.1.3	Worksheet 4.3 Practical sheet 4.3 Technician's notes 4.3 PowerPoint Presentation 4.3	Quick starter Homework worksheet Homework quiz Slideshow

Lesson number	Lesson title	Learning objectives	AQA specification reference	Lesson resources (on CD ROM)	Collins Connect resources
4.4	Oxidation and reduction in terms of electrons	• Use experimental results of displacement reactions to confirm the reactivity series. • Write ionic equations for displacement reactions. • Identify in a half equation which species are oxidised and which are reduced.	5.4.1.4	Worksheet 4.4 Practical sheet 4.4 Technician's notes 4.4 PowerPoint Presentations 4.4.1 and 4.4.2	Quick starter Homework worksheet Homework quiz
4.5	Reaction of metals with acids	• Describe how to make salts from metals and acids. • Write full balanced symbol equations for making salts. • Use half equations to describe oxidation and reduction.	5.4.2.1	Worksheets 4.5.1 and 4.5.2 Practical sheet 4.5 Technician's notes 4.5 PowerPoint Presentations 4.5.1 and 4.5.2	Quick starter Homework worksheet Homework quiz
4.6	Neutralisation of acids and salt production	• Describe ways that salts can be made. • Predict products from given reactants. • Deduce the formulae of salts from the formulae of common ions.	5.4.2.2	Worksheets 4.6.1 and 4.6.2 Practical sheet 4.6 Technician's notes 4.6	Quick starter Homework worksheet Homework quiz Video
4.7	Soluble salts	• Describe how to make pure, dry samples of soluble salts. • Explain how to name a salt. • Derive a formula for a salt from its ions.	5.4.2.3	Worksheets 4.7.1 and 4.7.2 Practical sheet 4.7 Technician's notes 4.7 PowerPoint Presentations 4.7.1 and 4.7.2	Quick starter Homework worksheet Homework quiz Video
4.8	Required practical: Preparing a pure, dry sample of a soluble salt from an insoluble oxide or carbonate	• Describe a practical procedure for producing a salt from a solid and an acid. • Explain the apparatus, materials and techniques used for making the salt. • Describe how to safely manipulate apparatus and accurately measure melting points.		Practical sheet 4.8 Technician's notes 4.8 PowerPoint Presentations 4.8.1 and 4.8.2	Quick starter Homework worksheet Homework quiz
4.9	pH and neutralisation	• Describe the use of universal indicator to measure pH. • Use the pH scale to identify acidic or alkaline solutions. • Investigate pH changes when a strong acid neutralises a strong alkali.	5.4.2.4	Worksheet 4.9 Practical sheet 4.9 Technician's notes 4.9.1, 4.9.2 and 4.9.3 PowerPoint Presentation 4.9	Quick starter Homework worksheet Homework quiz
4.10	Strong and weak acids	• Explain weak and strong acids by the degree of ionisation. • Describe neutralisation by the effect on hydrogen ions and pH.	5.4.2.5	Worksheet 4.10 Technician's notes 4.10 PowerPoint Presentation 4.10	Quick starter Homework worksheet Homework quiz Video

Lesson number	Lesson title	Learning objectives	AQA specification reference	Lesson resources (on CD ROM)	Collins Connect resources
		• Explain dilute and concentrated as amounts of substance.			
4.11	The process of electrolysis	• Identify reactions at electrodes during electrolysis. • Explain why a mixture is used and the anode needs constant replacement. • Write and balance half equations for the electrode reactions.	5.4.3.1	Worksheet 4.11 Practical sheet 4.11 Technician's notes 4.11 PowerPoint Presentation 4.11	Quick starter Homework worksheet Homework quiz Slideshow Video
4.12	Electrolysis of molten ionic compounds	• Identify which ions migrate to the cathode and anode. • Explain how the ions of a molten electrolyte are discharged. • Predict the products of electrolysis of molten binary compounds.	5.4.3.2	Worksheet 4.12 PowerPoint Presentation 4.12	Quick starter Homework worksheet Homework quiz
4.13	Using electrolysis to extract metals	• Explain the process of the electrolysis of aluminium oxide. • Explain why a mixture is used and the anode needs constant replacement. • Write half equations for the reactions at the electrodes.	5.4.3.3	Worksheet 4.13 PowerPoint Presentations 4.13.1 and 4.13.2	Quick starter Homework worksheet Homework quiz Slideshow
4.14	Electrolysis of aqueous solutions	• Explain the electrolysis of copper sulfate using inert electrodes. • Predict the products of the electrolysis of aqueous solutions. • Represent reactions at electrodes by half equations.	5.4.3.4, 5.4.3.5	Worksheet 4.14 Practical sheet 4.14 Technician's notes 4.14 PowerPoint Presentation 4.14	Quick starter Homework worksheet Homework quiz
4.15	Required practical: Investigating what happens when aqueous solutions are electrolysed using inert electrodes	• Use scientific theories and explanations to develop hypotheses. • Plan experiments to make observations and test hypotheses. • Apply a knowledge of the apparatus needed for electrolysis including use of inert electrodes and varying electrolytes. • Make and record observations.		Practical sheet 4.15 Technician's notes 4.15 PowerPoint Presentations 4.15.1 and 4.15.2	Quick starter Homework worksheet Homework quiz
4.16	Key concept: Electron transfer, oxidation and reduction	• Explain why atoms lose or gain electrons. • Explain oxidation and reduction by electron transfer. • Relate ease of losing electrons to reactivity.		Worksheet 4.16 Practical sheet 4.16 Technician's notes 4.16 PowerPoint Presentation 4.16	Quick starter Homework worksheet Homework quiz Video

Lesson number	Lesson title	Learning objectives	AQA specification reference	Lesson resources (on CD ROM)	Collins Connect resources
4.17	Maths skills: Make order of magnitude calculations	• Use graphs and diagrams to apply the pH scale to acid rain distribution. • Calculate the concentration of acids. • Calculate the effect of hydrogen ion concentration on the numerical value of pH.		Worksheet 4.17 Practical sheet 4.17 Technician's notes 4.17 PowerPoint Presentation 4.17	Quick starter Homework worksheet Homework quiz Video
Chapter 5: Energy changes					
5.1	Key concept: Endothermic and exothermic reactions	• Identify exothermic and endothermic reactions from temperature changes. • Evaluate the energy transfer of a fuel. • Investigate the variables that affect temperature changes in reacting solutions.	5.5.1.1, 5.5.1.2, 5.5.1.3	Worksheet 5.1 Practical sheet 5.1 Technician's notes 5.1 Graph plotters 5.1.1 and 5.1.2	Quick starter Homework worksheet Homework quiz Slideshow
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	• Use scientific theories and explanations to develop hypotheses. • Plan experiments to make observations and test hypotheses. • Evaluate methods to suggest possible improvements and further investigations.		Practical sheet 5.2 Technician's notes 5.2 PowerPoint Presentation 5.2	Quick starter Homework worksheet Homework quiz
5.3	Reaction profiles	• Draw simple reaction profiles (energy level diagrams). • Use reaction profiles to identify reactions as exothermic or endothermic. • Explain the energy needed for a reaction to occur and calculate energy changes.	5.5.1.2	Worksheets 5.3.1 and 5.3.2 Technician's notes 5.3 PowerPoint Presentation 5.3	Quick starter Homework worksheet Homework quiz Video
5.4	Energy change of reactions	• Describe the energy changes in bond breaking and bond making. • Explain how a reaction is endothermic or exothermic overall. • Calculate the energy transferred in chemical reactions using bond energies.	5.5.1.3	Worksheets 5.4.1 and 5.4.2 Technician's notes 5.4 PowerPoint Presentation 5.4	Quick starter Homework worksheet Homework quiz
5.5	Maths skills: Recognise and use	• Read scales in integers and using decimals. • Calculate the energy change during a reaction. • Calculate energy transferred for comparison.		Worksheet 5.5 Practical sheet 5.5 Technician's notes 5.5	Quick starter Homework worksheet Homework quiz

Lesson number	Lesson title	Learning objectives	AQA specification reference	Lesson resources (on CD ROM)	Collins Connect resources
	expressions in decimal form				Video
Chapter 6: The rate and extent of chemical change					
6.1	Measuring rates	• Explain how to measure the amount of gas given off in a reaction. • Explain how to measure the rate of a reaction. • Read data from graphs to interpret stages of a reaction.	5.6.1.1	Worksheet 6.1 Practical sheet 6.1 Technician's notes 6.1 PowerPoint Presentations 6.1.1 and 6.1.2 Graph plotter 6.1	Quick starter Homework worksheet Homework quiz
6.2	Key concept: Limiting reactants and molar masses	• Identify which reactant is in excess. • Explain the effect of a limiting quantity of a reactant on the amount of products. • Calculate amount of products in moles or masses in grams.	5.3.2.4	Worksheets 6.2.1 and 6.2.2 Practical sheet 6.2 Technician's notes 6.2 PowerPoint Presentation 6.2	Quick starter Homework worksheet Homework quiz Slideshow Video
6.3	Calculating rates	• Calculate the mean rate of a reaction. • Draw and interpret graphs of reaction times. • Draw tangents to the curves as a measure of the rate of reaction.	5.6.1.1	Worksheet 6.3 Practical sheet 6.3 Technician's notes 6.3 PowerPoint Presentations 6.3.1 and 6.3.2	Quick starter Homework worksheet Homework quiz
6.4	Factors affecting rates	• Identify which factors affect the rate of reactions. • Explain how changes of surface area affect rates. • Explain how rates are affected by different factors.	5.6.1.2	Worksheets 6.4.1 and 6.4.2 Practical sheet 6.4 Technician's notes 6.4 PowerPoint Presentation 6.4 Graph plotter 6.4	Quick starter Homework worksheet Homework quiz Video
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	• Use scientific theories and explanations to develop a hypothesis. • Plan experiments to test the hypothesis and check data. • Make and record measurements using gas syringes. • Evaluate methods and suggest improvements and further investigations.		Practical sheets 6.5.1 and 6.5.2 Technician's notes 6.5 PowerPoint Presentations 6.5.1 and 6.5.2 Graph plotter 6.5	Quick starter Homework worksheet Homework quiz

Lesson number	Lesson title	Learning objectives	AQA specification reference	Lesson resources (on CD ROM)	Collins Connect resources
6.6	Factors increasing the rate	• Analyse experimental data on rates of reaction. • Predict the effects of changing conditions on rates of reactions. • Use ideas about proportionality to explain the effect of a factor.	5.6.1.4	Worksheet 6.6 Practical sheet 6.6 Technician's notes 6.6 PowerPoint Presentation 6.6	Quick starter Homework worksheet Homework quiz Slideshow
6.7	Collision theory	• Describe a reaction in terms of particles colliding. • Explain the effect of changes of factors on rates of reaction using collision theory. • Describe activation energy.	5.6.1.3	Worksheets 6.7.1 and 6.7.2 PowerPoint Presentations 6.7.1 and 6.7.2	Quick starter Homework worksheet Homework quiz
6.8	Catalysts	• Investigate catalysts in reactions. • Explain catalytic action. • Explain activation energy.	5.6.1.5	Worksheet 6.8 Practical sheet 6.8 Technician's notes 6.8	Quick starter Homework worksheet Homework quiz Video
6.9	Reversible reactions and energy changes	• Identify a reversible reaction. • Explain how energy changes occur in reversible reactions. • Consider changing the conditions of a reversible reaction.	5.6.2.1, 5.6.2.2	Worksheet 6.9 Practical sheet 6.9 Technician's notes 6.9 PowerPoint Presentation 6.9	Quick starter Homework worksheet Homework quiz
6.10	Equilibrium	• Describe how equilibrium is reached. • Explain what happens to the forward and reverse reactions. • Predict the effects of changes on systems at equilibrium.	5.6.2.3	Worksheets 6.10 Technician's notes 6.10 PowerPoint Presentation 6.10	Quick starter Homework worksheet Homework quiz
6.11	Changing concentration and equilibrium	• Identify reactants and products in a reversible reaction. • Explain how changing concentrations changes the position of equilibrium. • Interpret data to predict the effect of a change in concentration.	5.6.2.4, 5.6.2.5	Technician's notes 6.11 Worksheet 6.11 PowerPoint Presentation 6.11	Quick starter Homework worksheet Homework quiz
6.12	Changing temperature and equilibrium	• Explain how exothermic reactions behave • Explain how endothermic reactions behave. • Apply Le Chatelier's principle to reactions in equilibrium.	5.6.2.6	Worksheets 6.12.1 and 6.12.2 Technician's 6.12 PowerPoint Presentation 6.12	Quick starter Homework worksheet Homework quiz
6.13	Changing pressure and equilibrium	• Predict the effects of changes in pressure. • Explain why these effects occur.	5.6.2.7	Worksheet 6.13 PowerPoint Presentation 6.13	Quick starter Homework worksheet Homework quiz

Lesson number	Lesson title	Learning objectives	AQA specification reference	Lesson resources (on CD ROM)	Collins Connect resources
		• Interpret data to predict the effect of a change in pressure.			
6.14	Maths skills: Use the slope of a tangent as a measure of rate of change	• Draw graphs from numeric data. • Draw tangents to the curve to observe how the slope changes. • Calculate the slope of the tangent to identify the rate of reaction.		Worksheets 6.14.1 and 6.14.2 PowerPoint Presentations 6.14.1 and 6.14.2	Quick starter Homework worksheet Homework quiz Video
Chapter 7: Hydrocarbons					
7.1	Crude oil, hydrocarbons and alkanes	• Describe why crude oil is a finite resource. • Identify the hydrocarbons in the series of alkanes. • Explain the structure and formulae of alkanes.	5.7.1.1	Worksheets 7.1.1 and 7.1.2	Quick starter Homework worksheet Homework quiz Video
7.2	Fractional distillation and petrochemicals	• 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.	5.7.1.2	Worksheets 7.2.1 and 7.2.2 Practical sheet 7.2 Technician's notes 7.2	Quick starter Homework worksheet Homework quiz Video
7.3	Properties of hydrocarbons	• 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.	5.7.1.3	Worksheets 7.3.1 and 7.3.2	Quick starter Homework worksheet Homework quiz Video
7.4	Combustion	• Describe the process of complete combustion. • Balance equations of combustion of hydrocarbons. • Explain the consequences of incomplete combustion.	5.7.1.3	Practical sheet 7.4 Technician's notes 7.4 Worksheet 7.4	Quick starter Homework worksheet Homework quiz
7.5	Cracking and alkenes	• Describe the usefulness of cracking. • Balance chemical equations as examples of cracking. • Explain how modern life depends on the uses of hydrocarbons.	5.7.1.4	Worksheet 7.5 Practical sheet 7.5 Technician's notes 7.5	Quick starter Homework worksheet Homework quiz
7.6	Key concept: Intermolecular forces	• Recognise the strong covalent bonds within molecules.		Worksheets 7.6.1 and 7.6.2	Quick starter Homework worksheet Homework quiz

Lesson number	Lesson title	Learning objectives	AQA specification reference	Lesson resources (on CD ROM)	Collins Connect resources
		• Recognise the weak intermolecular forces between molecules. • Describe the effects of weak intermolecular forces on properties of substances.			Video

7.7	Maths skills: Visualise and represent 3D models	• Use three-dimensional (3D) models to represent:
		  • alkanes
		  • alkenes
		  • polymers.
				Worksheets 7.7.1 and 7.7.2	Quick starter
					Homework worksheet
					Homework quiz
					Video

Chapter 8: Chemical analysis					
8.1	Key concept: Pure substances	• 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.	5.1.1.2, 5.8.1.1	Worksheets 8.1.1 and 8.1.2 Practical sheets 8.1.1 and 8.1.2 Technician's notes 8.1.1 and 8.1.2	Quick starter Homework worksheet Homework quiz
8.2	Formulations	• Identify formulations given appropriate information. • Explain the particular purpose of each chemical in a mixture. • Explain how quantities are carefully measured for formulation.	5.8.1.2	Worksheets 8.2.1 and 8.2.2	Quick starter Homework worksheet Homework quiz
8.3	Chromatography	• Explain how to set up paper chromatography. • Distinguish pure from impure substances. • Interpret chromatograms and determine R_f values.	5.8.1.3	Worksheet 8.3 Practical sheet 8.3 Technician's notes 8.3	Quick starter Homework worksheet Homework quiz Video
8.4	Required Practical: Investigate how paper chromatography can be used in forensic science to identify an ink mixture used in a forgery	• 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	Quick starter Homework worksheet Homework quiz
8.5	Testing for gases	• Recall the tests for four common gases. • Identify the four common gases using these tests.	5.8.2.1, 5.8.2.2, 5.8.2.3, 5.8.2.4	Practical sheet 8.5 Technician's notes 8.5 PowerPoint Presentation 8.5	Quick starter Homework worksheet Homework quiz

Lesson number	Lesson title	Learning objectives	AQA specification reference	Lesson resources (on CD ROM)	Collins Connect resources
		• Explain why limewater can be used for testing CO_2.			
8.6	Maths skills: Use an appropriate number of significant figures	• Measure distances on chromatograms. • Calculate R_f values. • Record R_f values to an appropriate number of significant figures.		PowerPoint Presentation 8.6	Quick starter Homework worksheet Homework quiz Video
Chapter 9: The atmosphere					
9.1	Proportions of gases in the atmosphere	• Identify the gases of the atmosphere. • Recall the proportions of the gases. • Explain how the balance of the gases is maintained.	5.9.1.1	Worksheets 9.1.1 and 9.1.2 Technician's notes 9.1	Quick starter Homework worksheet Homework quiz
9.2	The Earth's early atmosphere	• Describe ideas about the Earth's early atmosphere. • Interpret evidence about the Earth's early atmosphere. • Evaluate different theories about the Earth's early atmosphere.	5.9.1.2	Worksheet 9.2	Quick starter Homework worksheet Homework quiz Video
9.3	How oxygen increased	• Identify the processes allowing oxygen levels to increase. • Explain the role of algae in the composition of the atmosphere. • Recall the equation for photosynthesis.	5.9.1.3	Worksheet 9.3 PowerPoint Presentation 9.3	Quick starter Homework worksheet Homework quiz Slideshow
9.4	How carbon dioxide decreased	• Describe the main changes in the atmosphere over time. • Describe some of the likely causes of these changes. • Explain how the deposits of limestone, coal, crude oil and gas were formed.	5.9.1.4	Worksheet 9.4 Technician's notes 9.4 PowerPoint Presentations 9.4.1 and 9.4.2	Quick starter Homework worksheet Homework quiz
9.5	Key concept: Greenhouse gases	• Describe the greenhouse gases. • Explain the greenhouse effect. • Explain these processes as interaction of short and long wavelength radiation with matter.	5.9.2.1	Worksheet 9.5 PowerPoint Presentation 9.5	Quick starter Homework worksheet Homework quiz
9.6	Human activities	• Describe two activities that increase the amounts of carbon dioxide and methane. • Evaluate the quality of evidence in a report about global climate change.	5.9.2.2	Worksheet 9.6 PowerPoint Presentations 9.6.1 and 9.6.2	Quick starter Homework worksheet Homework quiz Video

Lesson number	Lesson title	Learning objectives	AQA specification reference	Lesson resources (on CD ROM)	Collins Connect resources
		• Recognise the importance of peer review of results and of communicating results to a wide range of audiences.			
9.7	Global climate change	• Describe four potential effects of global climate change. • Discuss the scale and risk of global climate change. • Discuss the environmental implications of climate change.	5.9.2.3	Worksheet 9.7 PowerPoint Presentation 9.7	Quick starter Homework worksheet Homework quiz Slideshow
9.8	Carbon footprint and its reduction	• Explain that the carbon footprint can be reduced by reducing emissions of carbon dioxide and methane. • Describe how emissions of carbon dioxide can be reduced. • Describe how emissions of methane can be reduced.	5.9.2.4	Worksheet 9.8 PowerPoint Presentation 9.8	Quick starter Homework worksheet Homework quiz Video
9.9	Limitations on carbon footprint reduction	• Give reasons why actions to reduce levels of carbon dioxide and methane may be limited. • Give reasons why methane is difficult to reduce.	5.9.2.4	Worksheets 9.9.1 and 9.9.2 PowerPoint Presentation 9.9	Quick starter Homework worksheet Homework quiz
9.10	Atmospheric pollutants from fuels	• Describe how carbon monoxide, soot, sulfur dioxide and oxides of nitrogen are produced by burning fuels. • Predict the products of combustion of a fuel knowing the composition of the fuel. • Predict the products of combustion of a fuel knowing the conditions in which it is used.	5.9.3.1	Worksheets 9.10.1, 9.10.2, 9.10.3 and 9.10.4 Technician's notes 9.10 PowerPoint Presentation 9.10	Quick starter Homework worksheet Homework quiz Slideshow
9.11	Properties and effects of atmospheric pollutants	• Describe and explain the problems caused by increased amounts of oxides of carbon, sulfur and nitrogen as pollutants in the air. • Describe and explain the effects of acid rain. • Evaluate the role of particulates in damaging human health.	5.9.3.2	Worksheets 9.11.1 and 9.11.2 Axes for Worksheet 9.11 PowerPoint Presentations 9.11.1 and 9.11.2 Pollution data spreadsheet 9.11	Quick starter Homework worksheet Homework quiz
9.12	Maths skills: Use ratios, fractions and percentages	• Use fractions and percentages to describe the composition of mixtures. • Use ratios to determine the mass of products expected.		Worksheet 9.12.1 and 9.12.2 Technician's notes 9.12 PowerPoint Presentation 9.12	Quick starter Homework worksheet Homework quiz Video

Lesson number	Lesson title	Learning objectives	AQA specification reference	Lesson resources (on CD ROM)	Collins Connect resources
		• Calculate percentage yields in chemical reactions.			
Chapter 10: Sustainable development					
10.1	Key concept: Using the Earth's resources and sustainable development	• Give examples of natural products replaced by synthetics. • Give examples of products replaced by agricultural products. • Distinguish between finite and renewable resources.	5.10.1.1	Worksheets 10.1.1 and 10.1.2	Quick starter Homework worksheet Homework quiz Video 1 Video 2
10.2	Potable water	• Distinguish between potable water and pure water. • Describe the differences in treatment of groundwater and salty water. • Give reasons for the steps used to produce potable water.	5.10.1.2	Worksheets 10.2.1, 10.2.2 and 10.2.3 Technician's notes 10.2	Quick starter Homework worksheet Homework quiz Video
10.3	Required Practical: Analysis and purification of water samples from different sources, including pH, dissolved solids and distillation	• Describe how safety is managed, apparatus is used and accurate measurements are made. • Recognise when sampling techniques need to be used and made representative. • Evaluate methods and suggest possible improvements and further investigations.		Worksheet 10.3 Practical sheets 10.3.1 and 10.3.2 Technician's notes 10.3	Quick starter Homework worksheet Homework quiz
10.4	Waste water treatment	• Explain how waste water is treated. • Describe how sewage is treated. • Compare the ease of treating waste, ground and salt water.	5.10.1.3	Worksheets 10.4.1, 10.4.2 and 10.4.3	Quick starter Homework worksheet Homework quiz Video
10.5	Alternative methods of metal extraction	• Describe the process of phytomining. • Describe the process of bioleaching. • Evaluate alternative biological methods of metal extraction.	5.10.1.4	Worksheets 10.5.1 and 10.5.2 Practical sheet 10.5 Technician's notes 10.5	Quick starter Homework worksheet Homework quiz
10.6	Life cycle assessment and recycling	• 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.	5.10.2.1	Worksheets 10.6.1 and 10.6.2	Quick starter Homework worksheet Homework quiz

Lesson number	Lesson title	Learning objectives	AQA specification reference	Lesson resources (on CD ROM)	Collins Connect resources
10.7	Ways of reducing the use of resources	• Describe ways of recycling and reusing materials. • Explain why recycling, reusing and reducing are needed. • Evaluate ways of reducing the use of limited resources.	5.10.2.2	Worksheets 10.7.1 and 10.7.2	Quick starter Homework worksheet Homework quiz Video
10.8	Maths skills: Translate information between graphical and numerical form	• To represent information from pie charts numerically. • To represent information from graphs numerically. • To represent information from numerical form graphically.		Worksheets 10.8.1 and 10.8.2	Quick starter Homework worksheet Homework quiz Video
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				