AQA GCSE Chemistry

Student checklist

C1

Name ..... Class ..... Date .....

Atomic structure

Lesson	Target 4		Target 6		Target 8	
C1.1 Atoms	I can define the word element.	☐	I can describe the basic structure of an atom.	☐	I can use chemical symbols of atoms to produce the chemical formulae of a range of elements and compounds.	☐
	I can classify familiar substances as elements or compounds.	☐	I can explain in detail, including diagrams, the difference between a pure element, mixture and compound.	☐	I can explain the significance of chemical symbols used in formulae and equations.	☐
	I can use the periodic table to find the symbols or names of given elements.	☐	I can name and give the chemical symbol of the first 20 elements in the periodic table.	☐		
C1.2 Chemical equations	I can describe familiar chemical reactions in word equations.	☐	I can explain why mass is conserved in a chemical reaction.	☐	I can justify in detail how mass may appear to change in a chemical reaction.	☐
	I can state that mass is conserved in a chemical reaction.	☐	I can describe familiar chemical reactions with balanced symbol equations including state symbols.	☐	I can describe unfamiliar chemical reactions with more complex balanced symbol equations, including state symbols.	☐
			I can balance given symbol equations.	☐	I can write balanced symbol equations.	☐
C1.3 Separating mixtures	I can define the word ‘mixture’.	☐	I can explain the difference between a compound and a mixture.	☐	I can use experimental data to explain the classification of a substance as a compound or a mixture.	☐
	I can identify a mixture and a compound.	☐	I can explain how the chemical properties of a mixture relate to the chemical it is made from.	☐	I can suggest an appropriate separation or purification technique for an unfamiliar mixture.	☐
	I can list different separation techniques.	☐	I can describe different separation techniques.	☐	I can explain in detail how multi-step separation techniques work.	☐

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Lesson	Target 4		Target 6		Target 8	
C1.4 Fractional distillation and paper chromatography	I can state when fractional distillation would be used.	☐	I can describe the process of fractional distillation.	☐	I can explain in detail how fractional distillation can separate miscible liquids with similar boiling points.	☐
	I can safely make a paper chromatogram.	☐	I can explain the main processes occurring in paper chromatography.	☐	I can evaluate separation or purification techniques for a given mixture.	☐
C1.5 History of the atom	I can list the significant models proposed for atoms.	☐	I can describe the differences between the plum-pudding and the nuclear model of the atom.	☐	I can justify why the model of the atom has changed over time.	☐
	I can identify the key parts of the plum-pudding model and the nuclear model of the atom.	☐	I can explain how evidence from scattering experiments changed the model of the atom.	☐	I can evaluate the current model of an atom.	☐
C1.6 Structure of the atom	I can state the relative charges and masses of subatomic particles.	☐	I can describe atoms using the atomic model.	☐	I can use the periodic table to find atomic number and mass number data and use it to determine the number of each subatomic particle in any given atom.	☐
	I can state that atoms have no overall charge (are neutral).	☐	I can explain why atoms have no overall charge.	☐	I can recognise and describe patterns in subatomic particles of elements listed in the periodic table.	☐
	I can label the subatomic particles on a diagram of a helium atom.	☐	I can use atomic number and mass numbers of familiar atoms to determine the number of each subatomic particle.	☐	I can explain why we can be confident that there are no missing elements in the first 10 elements of the periodic table.	☐

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Lesson	Target 4		Target 6		Target 8	
C1.7 Ions, atoms, and isotopes	I can state what an ion is.	☐	I can describe isotopes using the atomic model.	☐	I can use the periodic table to find atomic number and mass number data and use it to determine the number of each subatomic particle in an ion.	☐
	I can define an isotope.	☐	I can explain why ions have a charge.	☐	I can use SI units and prefixes to describe the size of an atom and its nucleus in standard form.	☐
	I can state the relative sizes of an atom and its nucleus.	☐	I can use atomic number and mass numbers of familiar ions to determine the number of each subatomic particle.	☐	I can explain why chlorine does not have a whole mass number.	☐
C1.8 Electronic structures	I can state that electrons are found in energy levels of an atom.	☐	I can write the standard electronic configuration notation from a diagram for the first 20 elements.	☐	I can use the periodic table to find atomic number and determine the electronic structure for the first 20 elements .	☐
	I can state the maximum number of electrons in the first three energy levels.	☐	I can explain why elements in the same group react in a similar way .	☐	I can make predictions for how an element will react when given information on another element in the same group.	☐

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C2

Name ..... Class ..... Date .....

The periodic table

Lesson	Target 4		Target 6		Target 8	
C2.1 Development of the periodic table	I can list the significant models for ordering the elements.	☐	I can describe how the elements are arranged in groups and periods in the periodic table.	☐	I can explain how and why the ordering of the elements has changed over time.	☐
	I can state how the elements are ordered in the periodic table.	☐	I can explain why the periodic table was a breakthrough in how to order elements.	☐		
C2.2 Electronic structures and the periodic table	I can define a group and period in the periodic table.	☐	I can describe how the electronic structure of metals and non-metals are different.	☐	I can explain how the electronic structure of metals and non-metals affects their reactivity.	☐
	I can describe how electronic structure is linked to the periodic table.	☐	I can explain in terms of electronic structure how the elements are arranged in the periodic table.	☐	I can use the periodic table to make predictions about the electronic structure and reactions of elements.	☐
	I can state that noble gases are unreactive.	☐	I can explain why the noble gases are unreactive and the trend in their boiling points.	☐	I can predict the electronic structure of stable ions for the first 20 elements.	☐
C2.3 Group 1- the alkali metals	I can name the first three elements in Group 1.	☐	I can recognise trends in supplied data.	☐	I can illustrate the reactions of Group 1 metals with balanced symbol equations.	☐
	I can describe the Group 1 metals as having low densities.	☐	I can explain why the elements in Group 1 react similarly and why the first three elements float on water.	☐	I can explain how Group 1 metals form ions with a +1 charge when they react with non-metals.	☐
	I can write word equations from descriptions of how Group 1 metals react with water.	☐	I can Describe how you can show that hydrogen and metal hydroxides are made when Group 1 metals react with water.	☐	I can justify how Group 1 metals are stored and the safety precautions used when dealing with them.	☐

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C2

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Lesson	Target 4		Target 6		Target 8	
C2.4 Group 7- the halogens	I can name the first four elements in Group 7.	☐	I can recognise trends in supplied data.	☐	I can illustrate the reactions of Group 7 metals with balanced symbol equations.	☐
	I can recognise a halogen displacement reaction.	☐	I can explain why the elements in Group 7 react similarly.	☐	I can explain how Group 7 non-metals form ions with a −1 charge when they react with metals.	☐
	I can describe the main properties of halogens.	☐	I can explain how to complete a halogen displacement reaction and explain what happens in the reaction.	☐	I can explain in detail how to compare the reactivity of the Group elements.	☐
C2.5 Explaining trends	I can state the trend in reactivity in Group 1.	☐	I can explain how electronic structure affects the trend in reactivity of Group 1 and Group 7 elements.	☐	I can use electronic structure to explain the trends in physical and chemical properties of Group 1 and Group 7 elements.	☐
	I can state the trend in reactivity in Group 7.	☐	I can use the nuclear model to explain how the outer electrons experience different levels of attraction to the nucleus.	☐	I can apply knowledge of reactivity of Groups 1 and 7 to suggest and explain the trend in reactivity of Group 2 and 6.	☐

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C3

Name ..... Class ..... Date .....

Structure and bonding

Lesson	Target 4		Target 6		Target 8	
C3.1 States of matter	I can identify the three states of matter and their state symbols.	☐	I can use data to determine the state of a substance at a given temperature.	☐	I can use the particle model to describe how energy, movement, and attraction between particles changes as a substance is heated or cooled.	☐
	I can describe the process of melting, freezing, boiling, and condensing.	☐	I can explain, in terms of particles, energy and temperature of a substance when it is at the melting point or boiling point.	☐	I can suggest why substances have different melting and boiling points from each other.	☐
	I can use the particle model to draw a representation of how particles are arranged in the three states of matter.	☐	I can describe the factors that affect rate of evaporation.	☐	(H) I can evaluate a model, explaining its limitations.	☐
C3.2 Atoms in ions	I can state the particles involved in ionic and covalent bonding.	☐	I can draw dot and cross diagrams of compounds formed between Group 1 and Group 7 elements.	☐	I can draw dot and cross diagrams of unfamiliar ionic compounds.	☐
	I can describe, with an example, how a Group 1 metal atom becomes a positive ion.	☐	I can explain how electron transfer allows ionic bonding to occur in the compound formed when a Group 1 metal reacts with a Group 7 non-metal.	☐	I can suggest and explain the charge of a monatomic ion based on its position in the periodic table.	☐
	I can describe, with an example, how a Group 7 non-metal atom becomes a negative ion.	☐				

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C3

Name ..... Class ..... Date .....

Lesson	Target 4		Target 6		Target 8	
C3.3 Ionic bonding	I can state that opposite charges attract.	☐	I can explain how the position of an element on the periodic table relates to the charge on its most stable monatomic ion.	☐	I can suggest the charge on unfamiliar ions using the position of the element in the periodic table.	☐
	I can write the charges of ions of Group 1, Group 2, Group 6, and Group 7 elements.	☐	I can explain, in terms of electronic structure, how unfamiliar elements become ions.	☐	I can explain the ratio of metal and non-metal ions in compounds.	☐
	I can describe an ionic lattice.	☐	I can interpret formula of familiar ionic compounds to determine the number and type of each ion present.	☐	I can generate formula of a wide range of ionic compounds when the charges of the ions are given.	☐
C3.4 Giant ionic structures	I can state that ionic compounds have high melting points and can dissolve in water.	☐	I can explain why ionic compounds have a high melting point.	☐	I can explain in detail why ionic compounds cannot conduct electricity when they are solid but can when molten or in solution.	☐
	I can state that ionic compounds can conduct electricity when molten or dissolved in water.	☐	I can describe, in terms of ions, how an ionic compound can conduct electricity.	☐	I can justify in terms of properties that a compound has ionic bonding.	☐
	I can describe an ionic lattice.	☐	I can explain the movement of ions in solutions or when molten.	☐	I can apply the ionic model to make predictions of the physical properties of ionic compounds.	☐
C3.5 Covalent bonding	I can describe a covalent bond.	☐	I can explain how a covalent bond forms in terms of electronic structure.	☐	I can draw dot and cross diagrams and ball and stick diagrams for unfamiliar small molecules.	☐
	I can recognise a covalent compound from its formula, name, or diagram showing bonds.	☐	I can draw dot and cross diagrams and ball and stick diagrams for H2, Cl2, O2, N2, HCl, H2O, NH3, and CH4.	☐	I can suggest how double and triple covalent bonds can be formed.	☐
	I can name familiar examples of small molecules which contain covalent bonds.	☐	I can describe a double bond in a diatomic molecule.	☐	I can suggest how the properties of a double bond could be different to the properties of a single covalent bond.	☐

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Name Class Date

Lesson	Target 4		Target 6		Target 8	
C3.6 Structure of simple molecules	I can state that small molecules have low melting and boiling points.	☐	I can explain how the size of molecules affects melting and boiling points	☐	I can predict the physical properties of unfamiliar covalently bonded substances.	☐
	I can state that small molecules do not conduct electricity.	☐	I can explain why small molecules and polymers do not conduct electricity.	☐	I can compare and contrast the properties of substances with different bonding.	☐
	I can describe an intermolecular force.	☐	I can identify substances that would have weak intermolecular forces.	☐	I can justify the use of a model to explain the physical properties of a small molecule and discuss the limitations of various molecular models.	☐
C3.7 Giant covalent structures	I can list the main physical properties of diamond and graphite.	☐	I can recognise the structure of diamond and graphite from information provided in written or diagrammatic form.	☐	I can use a molecular model of an unfamiliar giant covalent structure to predict and explain is physical properties.	☐
	I can state that giant covalent structures have high melting points.	☐	I can explain the properties of diamond in terms of its bonding.	☐	I can justify in detail a use for graphite based on its properties.	☐
	I can describe the structure of graphite in terms of layers of carbon atoms.	☐	I can explain the properties of graphite in terms of its bonding.	☐	I can justify in detail a use for diamond based on its properties.	☐
C3.8 Fullerenes and graphene	I can describe the relationship between graphite and graphene.	☐	I can recognise the structure of a fullerene or nanotube in diagrams and prose.	☐	I can describe and explain the applications of fullerenes.	☐
	I can list the main physical properties of fullerenes.	☐	I can explain the structure of fullerenes.	☐	I can use molecular models of graphene, nanotubes, and fullerenes to explain their properties.	☐
	I can state the molecular formula of buckminsterfullerene.	☐	I can list the properties and consequent uses of fullerenes and carbon nanotubes.	☐	I can justify in detail a use for graphene, nanotubes and fullerenes, based on their properties.	☐

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C3

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Lesson	Target 4		Target 6		Target 8	
C3.9 Bonding in metals	I can state that metals form a giant structure.	☐	I can describe metallic bonding.	☐	I can explain how metal atoms form giant structures.	☐
	I can recognise metallic bonding in diagrams.	☐	I can recognise and represent metallic bonding diagrammatically.	☐	I can evaluate different models of metallic bonding.	☐
C3.10 Giant metallic structures	I can list the physical properties of metals.	☐	I can explain key physical properties of metals using the model of metallic bonding.	☐	I can explain in detail, including labelled diagrams, how alloying affects the structure and bonding in metals and its effect on properties.	☐
	I can describe the structure of a pure metal.	☐	I can describe why metals are alloyed.	☐	I can justify in detail why alloys are more often used than pure metals.	☐

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C4

Name ..... Class ..... Date .....

Chemical calculations

Lesson	Target 4		Target 6		Target 8	
C4.1 Relative masses and moles	I can use the periodic table to identify the relative atomic mass for the first 20 elements.	☐	I can use the periodic table to find the relative atomic mass of all elements.	☐	I can explain why some elements have the same relative atomic mass as each other and why relative atomic masses may not be a whole number.	☐
	I can calculate the relative formula mass for familiar compounds when the formula is supplied and is without brackets.	☐	I can calculate the relative formula mass for unfamiliar compounds when the formula is given.	☐	I can calculate the number of moles or mass of a substance from data supplied.	☐
			I can state the units for the amount of substance.	☐	I can convert between units in calculations.	☐
C4.2 Equations and calculations (H)			I can explain why chemical equations must be balanced.	☐	I can interpret balanced symbol equations in terms of mole ratios.	☐
			I can calculate the relative formula mass for one substance when the relative formula masses are given for all the other substances in a balanced symbol equation.	☐	I can use balanced symbol equations to calculate reacting masses.	☐
C4.3 From masses to balanced equations (H)			I can explain why chemical equations must be balanced.	☐	I can explain the effect of a limiting reactant on the amount of product made.	☐
			I can identify the limiting reactant in a chemical reaction.	☐	I can use balanced symbol equations to calculate reacting masses when there is a limiting reactant.	☐

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C4

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Lesson	Target 4		Target 6		Target 8	
C4.4 Expressing concentrations	I can describe what the concentration of a solution is.	☐	I can explain how concentration of a solution can be changed.	☐	I can calculate the mass of a chemical when any volume and concentration is given.	☐
	I can calculate the concentration of a solution in g/dm3 when given the mass of solute in g and volume of solution in dm3.	☐	I can calculate the mass of solute (in g) in a solution when given the concentration in g/dm3 and volume in dm3 or cm3.	☐	I can explain the concentration of a solution in terms of particles.	☐

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C5

Name ..... Class ..... Date .....

Lesson	Target 4		Target 6		Target 8	
C5.1 The reactivity series	I can list the order of common metals in the reactivity series.	☐	I can describe oxidation and reduction in terms of gain or loss of oxygen.	☐	I can justify uses of metals in the reactivity series based on their chemical reactivity.	☐
	I can use general equations to write specific word equations for metals listed in the reactivity series reacting with oxygen, water, and acid.	☐	I can write word equations for the metals listed in the reactivity series reacting with oxygen, water, and acid and balance given symbol equations.	☐	I can write balanced symbol equations, with state symbols, for the metals listed in the reactivity series reacting with oxygen, water, and acid.	☐
	I can safely make and record observations.	☐	I can predict observations for the metals listed in the reactivity series reacting with oxygen, water, and acid.	☐	I can evaluate in detail the investigation of metals plus acid, assessing the control of variables and the validity of conclusions drawn from the data collected.	☐
C5.2 Displacement reactions	I can recall a definition of a displacement reaction.	☐	I can explain why a displacement reaction occurs.	☐	(H) I can describe displacement reactions using an ionic equation.	☐
	I can use the reactivity series to determine whether a reaction between a metal and a different metal salt would happen or not.	☐	I can write word equations and straightforward balanced symbol equations for displacement reactions.	☐	I can write balanced symbol equations, with state symbols, for displacement reactions.	☐
	I can safely make and record observations.	☐	I can predict observations for the metals listed in the reactivity series reacting with a different metal salt.	☐	(H) I can determine and explain which species is oxidised and which species (metal atom or ion) is reduced in a displacement reaction in terms of electron transfer.	☐

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C5

Name ..... Class ..... Date .....

Lesson	Target 4		Target 6		Target 8	
C5.3 Extracting metals	I can define oxidation and reduction in terms of oxygen.	☐	I can identify species that are being oxidised and reduced in a chemical reaction.	☐	I can explain how carbon or hydrogen can be used to reduce an ore.	☐
	I can describe how metals can be extracted.	☐	I can explain why some metals are found uncombined in the Earth's crust.	☐	I can evaluate the extraction process to obtain a metal from its ore.	☐
C5.4 Salts from metals	I can recall a definition of a salt.	☐	I can describe how to make a salt by reacting a metal with an acid.	☐	(H) I can explain the reaction between a metal and an acid.	☐
	I can name a salt formed between a metal and sulfuric acid or hydrochloric acid.	☐	I can write a balanced symbol equation to describe a reaction between a metal and sulfuric acid or hydrochloric acid.	☐	(H) I can write ionic and half equations, including state symbols, to describe a reaction between a metal and sulfuric acid or hydrochloric acid.	☐
	I can recall a general equation for a metal reacting with an acid and use it to write specific word equations.	☐	I can identify the formula of the salt produced from the reaction between an acid and a metal.	☐	(H) I can identify and explain in detail which species is oxidised and which is reduced in a reaction.	☐
C5.5 Salts from insoluble bases	I can safely prepare a pure, dry sample of a soluble salt from an insoluble base and a dilute acid.	☐	I can describe a method to prepare a pure, dry sample of a soluble salt from an insoluble substance and a dilute acid.	☐	(H) I can explain the reaction between a metal oxide or metal hydroxide and an acid, including an ionic equation.	☐
	I can name a salt formed between a metal hydroxide or metal oxide and sulfuric acid or hydrochloric acid.	☐	I can write a balanced symbol equation to describe a reaction between a metal hydroxide or oxide and sulfuric acid or hydrochloric acid.	☐	I can generate the formulae of salts given the names of the metal or base and the acid.	☐
	I can recall a general equation for a base reacting with an acid and use it to write specific word equations.	☐	I can explain why the reaction between a base and a dilute acid is a neutralisation reaction.	☐	I can explain how alkalis are a subgroup of bases.	☐

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C5

Name ..... Class ..... Date .....

Lesson	Target 4		Target 6		Target 8	
C5.6 Making more salts	I can safely make a salt by reacting a metal carbonate with a dilute acid.	☐	I can describe how to make a dry sample of a salt from reacting a metal carbonate or an alkali with a dilute acid.	☐	I can explain the reaction between ammonia and dilute acids to produce salts and the agricultural importance of the salts.	☐
	I can write a general word equation for metal carbonates and alkalis reacting with dilute acids and use this to make specific word equations.	☐	I can write balanced symbol equations for neutralisation reactions.	☐	I can describe neutralisation using ionic equations, including the ionic equation for a carbonate plus an acid.	☐
C5.7 Neutralisation and the pH scale	I can safely use universal indicator to classify as acidic or alkaline.	☐	I can describe how universal indicator can be used to classify a chemical as acidic or alkaline.	☐	I can evaluate how universal indicator or a data logger can be used to determine the approximate pH of a solution.	☐
	I can describe the pH scale.	☐	I can describe how solutions can be acidic or alkali.	☐	I can use ionic equations to explain how solutions can be acidic or alkali.	☐
	I can recall an example of an alkali, neutral, base, and acidic chemical.	☐	I can describe the relationship between alkalis and bases.	☐	I can explain how the pH of a solution changes as acid or alkali is added.	☐
C5.8 Electronic structures (H)			I can recall examples of strong and weak acids.	☐	I can explain the difference between concentration and strong or weak in terms of acids and alkalis.	☐
			I can describe how an acid or alkali can be concentrated or dilute.	☐	I can use ionic equations to explain how acids can be strong or weak.	☐
			I can describe how an acid or alkali can be weak or strong.	☐	I can quantatively explain how the concentration of hydrogen ions relates to the pH number.	☐

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C6 Electrolysis

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Lesson	Aiming for 4		Aiming for 6		Aiming for 8	
C6.1 Introduction to electrolysis	I can define electrolysis.	☐	I can describe electrolysis in terms of movement of ions.	☐	I can explain why electrolysis can only occur when an ionic compound is molten or in aqueous solution.	☐
	I can write a word equation to describe the electrolysis of a molten ionic compound.	☐	I can write a balanced symbol equation including state symbols for the overall electrolysis of a molten ionic compound.	☐	I can describe electrolysis with half equations at the electrodes.	☐
			I can predict the products at each electrode for the electrolysis of a molten ionic compound.	☐	I can explain the classification of the reactions at each electrode as oxidation or reduction.	☐
C6.2 Changes at the electrodes	I can state that oxygen can be produced at the anode when some solutions are electrolysed.	☐	I can describe electrolysis of solutions in terms of movement of ions.	☐	I can explain how hydrogen ions and hydroxide ions can be present in solutions, including a balanced symbol equation with state symbols, for the reversible reaction in which water ionises.	☐
	I can state that hydrogen can be produced at the cathode when some solutions are electrolysed.	☐	I can write a balanced symbol equation including state symbols for the overall electrolysis of a solution.	☐	I can describe electrolysis with half equations at the electrodes.	☐
	I can write a word equation to describe electrolysis of a solution.	☐	I can predict the products at each electrode for the electrolysis of a molten ionic compound or its solution.	☐	I can explain the classification of reactions at the electrodes as oxidation or reduction.	☐

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C6 Electrolysis

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Lesson	Aiming for 4		Aiming for 6		Aiming for 8	
C6.3 Extraction of aluminium	I can state that aluminium can be extracted from aluminium oxide using electrolysis.	☐	I can describe the electrolysis of aluminium oxide.	☐	I can explain why electrolysis is used to extract aluminium from compounds.	☐
	I can write a word equation to describe the electrolysis of aluminium oxide.	☐	I can explain why electrolysis is an expensive metal extraction method and illustrate this with the extraction of aluminium.	☐	I can describe electrolysis with half equations at the electrodes.	☐
			I can explain why cryolite is added to aluminium oxide in the industrial extraction of aluminium.	☐	I can explain the classification of the reactions at each electrode as oxidation or reduction.	☐
C6.4 Electrolysis of aqueous solutions	I can state the products of the electrolysis of brine and a use for each.	☐	I can describe how to electrolyse brine in terms of ions moving.	☐	I can explain the electrolysis of brine using half equations, classifying reactions at the electrode as oxidation or reduction.	☐
	I can safely electrolyse a solution, with guidance provided.	☐	I can predict the products of electrolysis of a solution.	☐	I can evaluate in detail an investigation we have planned and carried out, commenting on our methodology and quality of the data collected.	☐
			I can plan and carry out an electrolysis investigation.	☐	I can explain the classification of the reactions at each electrode as oxidation or reduction.	☐

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C7 Energy changes

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Lesson	Aiming for 4		Aiming for 6		Aiming for 8	
C7.1 Exothermic and endothermic reactions	I can define exothermic and endothermic reactions.	☐	I can describe examples of exothermic and endothermic reactions.	☐	I can explain a chemical reaction in terms of energy transfer.	☐
	I can state that energy is conserved in a chemical reaction.	☐	I can explain, using observations from calorimetry, how to classify a reaction as exothermic or endothermic.	☐	I can plan, carry out, and evaluate the errors in a calorimetry investigation.	☐
	I can safely complete a calorimetry experiment for a reaction that takes place in solution.	☐	I can explain in detail how to carry out a calorimetry experiment.	☐		
C7.2 Using energy transfers from reactions	I can state a use of an exothermic reaction and an endothermic reaction.	☐	I can explain how an energy change from a chemical reaction can be used.	☐	I can suggest a chemical reaction for a specific purpose based on the energy change for the reaction.	☐
	I can write word equations for familiar reactions.	☐	I can write balanced symbol equations for familiar reactions.	☐	I can evaluate in detail the uses of exothermic and endothermic reactions.	☐
C7.3 Reaction profiles	I can define activation energy.	☐	I can label activation energy on a reaction profile diagram.	☐	I can explain why chemical reactions need activation energy to start them.	☐
	I can sketch a generic reaction profile diagram for an exothermic or endothermic reaction.	☐	I can generate a specific reaction profile diagram for a given chemical reaction when its energy change is also supplied.	☐	I can use the particle model to explain how a chemical reaction occurs.	☐
			I can identify bonds broken in reactants and new bonds made in products of a reaction.	☐	I can explain energy change in terms of the balance between bond making and bond breaking.	☐

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C7 Energy changes

Name ..... Class ..... Date .....

Lesson	Aiming for 4	Aiming for 6		Aiming for 8	
C7.4 Bond energy calculations		I can explain, using the particle model, how reactants become products in a chemical reaction.	☐	I can calculate the energy needed to break the reactant bonds and the energy released when the product bonds are made.	☐
		I can explain why bond breaking is endothermic and bond making is exothermic.	☐	I can calculate the energy change for a reaction, including the correct unit.	☐
		I can define bond energy and identify all the bonds that break and are made in a chemical reaction.	☐	I can explain in terms of bond energies how a reaction is either exothermic or endothermic.	☐

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C8 Rates and equilibrium

Name ..... Class ..... Date .....

Lesson	Aiming for 4		Aiming for 6		Aiming for 8	
8.1 Rate of reaction	I can recall a definition for rate of reaction.	☐	I can explain how there can be different units for measuring rate of reaction.	☐	I can plot and use a graph to calculate the gradient to measure the initial rate of reaction.	☐
	I can safely describe and follow a method to monitor rate of reaction.	☐	I can calculate the mean rate of reaction.	☐	I can justify a chosen method for a given reaction to monitor the rate of reaction.	☐
	I can state the units for rate of reaction.	☐	I can calculate the rate of reaction at a specific time.	☐	I can explain why there is more than one unit for rate of reaction.	☐
C8.2 Collision theory and surface area	I can describe how surface area of a solid can be increased.	☐	I can describe how changing the surface area changes the rate of reaction.	☐	I can use collision theory to explain in detail how increasing surface area increases the rate of reaction.	☐
	I can state that chemical reactions can only occur when a collision occurs with enough energy.	☐	I can describe what the activation energy of a reaction is.	☐	I can use a graph to calculate the rate of reaction at specific times in a chemical reaction.	☐
	I can list the factors that can affect the rate of a chemical reaction.	☐	I can calculate the surface area to volume ratio.	☐	I can explain why many collisions do not lead to a chemical reaction.	☐
C8.3 The effect of temperature	I can describe how temperature affects the rate of reaction.	☐	I can use collision theory to explain how changing temperature alters the rate of reaction.	☐	I can use a graph to calculate the rate of reaction at specific times in a chemical reaction.	☐
	I can safely an experiment on how temperature affects the rate of a reaction.	☐	I can calculate mean rates of reaction.	☐	I can calculate (1/t) and plot a graph with a more meaningful line of best fit.	☐

AQA GCSE Chemistry
Student Checklist

C8 Rates and equilibrium

Name ..... Class ..... Date .....

Lesson	Aiming for 4		Aiming for 6		Aiming for 8	
C8.4 The effect of concentration or pressure	I can describe how changing concentration affects the rate of reaction.	☐	I can use collision theory to explain how changing concentration or pressure alters the rate of reaction.	☐	I can interpret a rate of reaction graph, including calculating the rate of reaction at specific times in a chemical reaction.	☐
	I can describe how changing pressure affects the rate of gas phase reactions.	☐	I can calculate mean rates of reaction.	☐	I can explain why changing pressure has no effect on the rate of reaction for some reactions.	☐
			I can explain how to change gas pressure.	☐	I can justify quantitative predictions and evaluate in detail their investigation into the effect of concentration on rate of reaction.	☐
C8.5 The effect of catalysts	I can define a catalyst.	☐	I can use collision theory to explain how adding a catalyst alters the rate of reaction.	☐	I can use a reaction profile diagram to explain in detail the effect of adding a catalyst.	☐
	I can describe how adding a catalyst affects the rate of reaction.	☐	I can explain, with an example, the industrial use of a catalyst.	☐	I can justify the use of catalysts in industry and in household products.	☐
	I can describe and carry out a method to safely investigate which catalyst is best for a reaction.	☐	I can calculate the mean rate of reaction.	☐	I can explain what an enzyme is and how it works.	☐
C8.6 Reversible reactions	I can define a reversible reaction.	☐	I can explain, using a familiar reaction, how a reaction can be reversible.	☐	I can describe an unfamiliar reversible reaction, using a balanced symbol equation with state symbols.	☐
	I can write a word equation for a familiar reversible reaction.	☐	I can describe a familiar reversible reaction using a balanced symbol equation.	☐	I can justify the use of reversible reactions in the lab and items available in the home.	☐
	I can state an example of a reversible reaction.	☐	I can predict the observations of a familiar reversible reaction when the conditions are changed.	☐	I can justify the classification of a reaction as reversible.	☐

AQA GCSE Chemistry
Student Checklist

C8 Rates and equilibrium

Name ..... Class ..... Date .....

Lesson	Aiming for 4		Aiming for 6		Aiming for 8	
C8.7 Energy and reversible reactions	I can state whether a reversible reaction is exothermic or endothermic in the reverse direction if the forward direction is stated.	☐	I can explain why the energy change in a reversible reaction is exothermic in one direction and endothermic in the reverse direction.	☐	I can explain in detail the energy changes in an equilibrium system.	☐
	I can write the word equation for the reversible reaction of dehydration/hydration of copper	☐	I can generate balanced symbol equations for reversible reactions from information provided.	☐	I can suggest and explain a simple laboratory test which could be completed using a reversible reaction.	☐
			I can make predictive observations of familiar reversible reactions when information is supplied.	☐	I can make predictive observations of unfamiliar reversible reactions when information is supplied.	☐
C8.8 Dynamic equilibrium	I can define a dynamic equilibrium.	☐	I can describe how to achieve dynamic equilibrium.	☐	I can explain dynamic equilibrium.	☐
	I can describe a closed system.	☐	I can describe how the rate of the forward reaction compares to the rate of the backward reaction in dynamic equilibrium.	☐	I can explain why the concentration of chemicals in a dynamic equilibrium remains constant.	☐
			I can describe Le Chatelier's Principle.	☐	I can predict the effect on the rate forward and reverse reactions by applying the Le Chatelier's Principle when the conditions of a dynamic equilibrium are changed.	☐
C8.9 Altering conditions			I can explain how changing conditions for a system at dynamic equilibrium affects the rate of the forward and reverse	☐	I can explain why changing pressure has no effect on some systems.	☐
			I can predict the effect on yield of changing temperature, concentration, or pressure in a given equilibrium system.	☐	I can justify, in detail, the compromise conditions chosen in given industrial processes.	☐

AQA GCSE Chemistry
Student Checklist

C9 Crude oil and fuels

Name ..... Class ..... Date .....

Lesson	Aiming for 4		Aiming for 6		Aiming for 8	
C9.1 Hydrocarbons	I can describe the composition of a crude oil.	☐	I can describe how to separate crude oil into fractions in a school laboratory.	☐	I can explain why fractional distillation is used to separate crude oil into fractions.	☐
	I can state a definition of a hydrocarbon.	☐	I can classify a hydrocarbon as an alkane.	☐	I can apply a general formula to generate a molecular formula and a displayed formula for a straight-chain alkane.	☐
	I can state a definition of an alkane.	☐	I can state the names and describe the first four alkanes.	☐	I can classify and justify the classification of a chemical as an alkane.	☐
C9.2 Fractional distillation of oil	I can name the different fractions from crude oil.	☐	I can describe how the trend in colour, viscosity, flammability, and boiling point changes as the length of the hydrocarbon chain changes.	☐	I can explain in detail how fractional distillation is used to separate crude oil into fractions.	☐
	I can state a use for each fraction from crude oil.	☐	I can describe how the properties of a fraction of crude oil make it appropriate for its use.	☐	I can explain how chain length affects the properties of crude oil fractions.	☐
					I can make predictions about the properties of crude oil fractions from the fraction's hydrocarbon chain length.	☐

AQA GCSE Chemistry
Student Checklist

C9 Crude oil and fuels

Name ..... Class ..... Date .....

Lesson	Aiming for 4		Aiming for 6		Aiming for 8	
C9.3 Burning hydrocarbon fuels	I can define complete and incomplete combustion.	☐	I can explain the differences between complete and incomplete combustion.	☐	I can justify the use of a given fuel over another.	☐
	I can write a word equation to describe the complete combustion of a hydrocarbon.	☐	I can write balanced symbol equations for the complete and incomplete combustion of hydrocarbons.	☐	I can explain in detail how the production of carbon monoxide in incomplete combustion can be lethal.	☐
	I can write a word equation to describe the incomplete combustion of a hydrocarbon.	☐	I can explain how to test for the products of complete combustion.	☐	I can use balanced symbol equations to calculate amounts of reactants or products in a combustion reaction.	☐
C9.4 Cracking hydrocarbons	I can define the process of cracking.	☐	I can describe the process of cracking, including conditions.	☐	I can use examples to explain the process of cracking and why it is so important to the petrochemical industry.	☐
	I can generate a word equation to describe cracking.	☐	I can generate a balanced symbol equation to describe cracking.	☐	I can explain the similarities and differences between alkanes and alkenes.	☐
	I can recognise and give examples of alkenes.	☐	I can describe a chemical test to show an alkene is present.	☐	I can explain, using balanced symbol equations, the reaction between bromine water and an alkene.	☐

AQA GCSE Chemistry
Student Checklist

C10 Chemical analysis

Name ..... Class ..... Date .....

Lesson	Aiming for 4		Aiming for 6		Aiming for 8	
C10.1 Pure substances and mixtures	I can state what a pure substance is.	☐	I can describe the difference between pure substances, impure substances, and formulations.	☐	I can justify the classification of pure substances, impure substances, and formulations when data is supplied.	☐
	I can describe how melting point and boiling point data can be used to identify pure substances.	☐	I can explain how melting point and boiling point data can be used to determine the purity of a substance.	☐	I can explain in detail the use of formulations.	☐
	I can state what a formulation is.	☐	I can state uses of formulations.	☐	I can calculate percentage compositions of components in a range of formulations.	☐
C10.2 Analysing chromatograms	I can describe and safely carry out a method to make a paper chromatogram.	☐	I can explain how chromatography separates solutes.	☐	I can explain why different substances and different conditions will have different R_f values.	☐
	I can describe how to calculate R_f values.	☐	I can calculate R_f values from given data.	☐	I can calculate R_f values from a chromatogram, using an appropriate number of significant figures.	☐
	I can describe a use of chromatography.	☐	I can use a chromatogram to determine if a sample is pure or impure.	☐	I can interpret a chromatogram to identify unknown substances.	☐
C10.3 Testing for gases	I can safely carry out the laboratory test for hydrogen, oxygen, carbon dioxide, and chlorine.	☐	I can explain why limewater turns milky when it reacts with carbon dioxide.	☐	I can write balanced symbol equations, including state symbols, for the reactions of limewater with carbon dioxide and hydrogen with oxygen.	☐
	I can describe how to safely carry out the laboratory test for chlorine gas.	☐	I can interpret results to identify a gas that is present.	☐	I can explain why a glowing splint re-ignites in oxygen.	☐
	I can identify hydrogen, carbon dioxide, and oxygen from a laboratory test.	☐	I can explain why hydrogen 'pops' near a naked flame.	☐	I can explain why chlorine gas turns damp indicator paper colourless.	☐

AQA Chemistry GCSE Student Checklist

C11 The Earth's atmosphere

Name ..... Class ..... Date .....

Lesson	Aiming for 4		Aiming for 6		Aiming for 8	
C11.1 History of our atmosphere	I can describe the Earth's early atmosphere.	☐	I can state the composition, including formulae, of the Earth's early atmosphere.	☐	I can use a theory to explain in detail how the atmosphere developed.	☐
	I can describe how oxygen was formed in the development of the atmosphere.	☐	I can describe a theory for the development of the Earth's atmosphere.	☐	I can explain the limits of the theory for the development of the Earth's atmosphere and why it has changed.	☐
			I can explain, using word equations, how gases were formed in the atmosphere and oceans were formed.	☐	I can use balanced symbol equations to explain how gases were formed in the atmosphere and explain how oceans were formed.	☐
C11.2 Our evolving atmosphere	I can state that the levels of carbon dioxide have decreased in the atmosphere.	☐	I can describe how the proportion of carbon dioxide in the early atmosphere was reduced.	☐	I can use a theory to explain in detail how the early atmosphere developed to form the atmosphere today.	☐
	I can list the names and symbols of the gases in dry air.	☐	I can state the composition of dry air.	☐	I can explain why the compositions of the Earth's atmosphere has not changed much for 200 million years.	☐
	I can state where methane and ammonia in the atmosphere may have come from.	☐	I can use word equations to show how carbon dioxide can form sedimentary rocks.	☐	I can use balanced symbol equations to explain how carbon dioxide forms sedimentary rock and how methane and ammonia were removed from the atmosphere.	☐

AQA Chemistry GCSE Student Checklist

C11 The Earth's atmosphere

Name ..... Class ..... Date .....

Lesson	Aiming for 4		Aiming for 6		Aiming for 8	
C11.3 Greenhouse gases	I can describe the greenhouse effect.	☐	I can explain the greenhouse effect.	☐	I can justify why scientists, as well as the public, disagree about the cause of climate change.	☐
	I can name three greenhouse gases.	☐	I can explain how greenhouse gases increase the temperature of the atmosphere.	☐	I can explain the difference between global warming and the greenhouse effect.	☐
	I can state some human activities that affect the proportion of greenhouse gases.	☐	I can explain how human activity can change the proportion of greenhouse gases in the atmosphere.	☐	I can evaluate evidence to suggest if global warming is man-made or natural.	☐
C11.4 Global climate change	I can list some of the possible outcomes of climate change.	☐	I can explain the possible effects of global climate change and why they are difficult to predict.	☐	I can evaluate the scale, risk, and environmental impact of global climate change.	☐
	I can state a definition for carbon footprint.	☐	I can explain possible methods to reduce greenhouse gas emissions.	☐	I can justify why reducing greenhouse gas emissions can be difficult to achieve.	☐
	I can list some ways to reduce a carbon footprint.	☐	I can explain some of the problems in trying to reduce greenhouse gas emissions.	☐	I can evaluate the use of products, services, or events in terms of their carbon footprint.	☐
C11.5 Atmospheric pollutants	I can list some atmospheric pollutants.	☐	I can explain how sulphur dioxide and nitrogen oxides are made when fossil fuels are combusted.	☐	I can predict the products of combustion of a fuel given appropriate information about the composition of the fuel and the conditions in which it is used.	☐
	I can describe how carbon monoxide and soot (carbon) can be made from the incomplete combustion of fossil fuels.	☐	I can describe the health impacts of atmospheric pollutants.	☐	I can evaluate the negative social, economic, and environmental consequences of atmospheric pollution.	☐
	I can complete word equations to describe how atmospheric pollutants can be made.	☐	I can use balanced symbol equations to show how atmospheric pollutants are formed.	☐	I can suggest and explain methods to reduce atmospheric pollution.	☐

AQA GCSE Chemistry
Student Checklist

C12 The Earth's resources

Name ..... Class ..... Date .....

Lesson	Aiming for 4		Aiming for 6		Aiming for 8	
C12.1 Finite and renewable resources	I can list some human uses of the Earth's resources.	☐	I can describe and classify a resource as finite or renewable when information is given.	☐	I can understand data and interpret information using orders of magnitude to compare.	☐
	I can give examples of a finite and a renewable resource.	☐	I can explain the use of natural, sustainable, and finite resources.	☐	I can explain the role of chemistry in improving agricultural and industrial processes.	☐
	I can state an example of a natural product that is supplemented or replaced by agricultural or synthetic products.	☐	I can interpret information from different formats including graphs, charts, tables, and prose.	☐	I can draw conclusions consistent with information provided from graphs, charts, tables, and prose and evaluate the validity of the data.	☐
C12.2 Water safe to drink	I can describe why potable water is important.	☐	I can explain the method of obtaining potable water depends on the local conditions.	☐	I can explain the difference between pure water and potable water.	☐
	I can list the key processes to make drinking water.	☐	I can explain reasons for filtration and sterilisation in water treatment.	☐	I can justify the choice of potable water supply in a given scenario.	☐
	I can safely distil salty water.	☐	I can describe and explain in detail how to safely distil salty water.	☐	I can explain in detail why desalination is not often used to generate safe clean drinking water and justify when it is used.	☐
C12.3 Treating waste water	I can list what is removed from waste water before it can be released.	☐	I can explain why waste water should be treated before it is released into the environment.	☐	I can evaluate the ease of obtaining potable water from waste, ground, or salt water.	☐
	I can state the main processes in sewage treatment.	☐	I can describe the main processes in sewage treatment.	☐	I can explain in detail how and why waste water is processed before it is released into the environment.	☐
	I can state uses of sewage slurry.	☐	I can explain the uses of sewage slurry.	☐	I can evaluate the use of sewage slurry.	☐

AQA GCSE Chemistry
Student Checklist

C12 The Earth's resources

Name ..... Class ..... Date .....

Lesson	Aiming for 4		Aiming for 6		Aiming for 8	
C12.4 Extracting metals from ores			I can describe the processes of phytomining and bioleaching.	☐	I can explain in detail how phytomining and bioleaching extract metals.	☐
			I can write balanced symbol equations to explain metal extraction techniques.	☐	I can write ionic equations to explain metal extraction techniques and identify the species being oxidised or reduced.	☐
			I can explain the need for new ways of extracting metals (in particular copper).	☐	I can evaluate biological methods of metal extraction.	☐
C12.5 Life Cycle Assessments	I can state the different stages of an LCA in the correct order.	☐	I can explain the importance of LCA and how it can be misused.	☐	I can explain the limits of LCAs.	☐
	I can carry out an LCA for shopping bags made from plastic or paper with support.	☐	I can carry out LCAs for different products when data is supplied.	☐	I can evaluate products in detail using LCAs.	☐
C12.6 Reduce, reuse, and recycle	I can list some products that can be reused or recycled.	☐	I can explain the importance of reusing and recycling products.	☐	I can evaluate the environmental, economic, and social impacts of reusing and recycling products.	☐
	I can describe how metal can be reused and recycled.	☐	I can explain why some recycling can be difficult.	☐	I can evaluate ways of reducing the use of limited resources.	☐
	I can describe how glass can be reused and recycled.	☐	I can evaluate ways of reducing the use of limited resources when information is given.	☐	I can suggest ways of minimising the environmental impact of exploiting raw materials.	☐