AQA GCSE Chemistry
Student checklist

C3

Name _____ Class _____ Date _____

Structure and bonding

Lesson	Aiming for 4		Aiming for 6		Aiming for 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.	☐	I can evaluate a model, explaining its limitations. (H)	☐
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.	☐				
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.	☐

AQA GCSE Chemistry

Student checklist

C3

Name _____ Class _____ Date _____

	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 H_2, Cl_2, O_2, N_2, HCl, H_2O, NH_3, and CH_4.	☐	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.	☐
C3.6 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.	☐

AQA GCSE Chemistry

Student checklist

C3

Name _____ Class _____ Date _____

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.	☐
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 Bonding in metals	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.	☐

AQA GCSE Chemistry

Student checklist

C3

Name _____ Class _____ Date _____

C3.11 Nanoparticles	I can state a definition of nanoscience.	☐	I can describe the size of nanoparticles.	☐	I can classify a particle as coarse, fine, or nanoparticles based on their size.	☐
	I can describe how surface area to volume increases as particle size reduces.	☐	I can explain why surface area to volume ratio increases as particle size decrease.	☐	I can quantitatively explain the relationship between surface area to volume ratio and particle size and its effect on properties.	☐
	I can recognise that the negative indices in standard form used in nanoscience are very small numbers.	☐	I can convert lengths into standard form.	☐	I can convert standard form into a variety of length units.	☐
C3.12 Applications of nanoscience	I can state that nanoparticles can be used in sun cream.	☐	I can list the advantages and disadvantages of using nanoparticles.	☐	I can evaluate the use of nanoparticles in their applications, including sun cream.	☐
	I can list a variety of uses of nanoparticles.	☐	I can explain why nanoparticles can have new applications.	☐	I can decide and justify in detail why nanotechnology research should continue.	☐

Lesson	Aiming for 4	Aiming for 6	Aiming for 8

AQA GCSE Chemistry

Student checklist

C3

Name _____ Class _____ Date _____

C15.1 Rusting	I can define the term corrosion.	☐	I can describe an experiment to investigate the conditions required for rusting to occur.	☐	I can explain in detail why corrosion is a problem.	☐
	I can state what is required for iron to rust.	☐	I can, with the help of equations, describe the process of rusting.	☐	I can write balanced equations to describe rusting and identify species that are oxidised and reduced.	☐
	I can list some ways to prevent rusting.	☐	I can explain how different corrosion prevention techniques work.	☐	I can evaluate rust prevention techniques and suggest which is best for a specific purpose.	☐
C15.2 Useful alloys	I can state the difference between a metal before and after being alloyed.	☐	I can explain in detail why pure metals are often alloyed before they are used.	☐	I can explain the term carat.	☐
	I can state the elements in steel and bronze.	☐	I can describe how different amounts of carbon affect the properties of iron.	☐	I can use data on the properties of unfamiliar alloys to explain a suitable alloy for a given purpose.	☐
	I can list some common examples of alloys and their uses.	☐	I can identify an appropriate purpose for an alloy when given data on its properties.	☐	I can evaluate an alloy in terms of its properties and uses.	☐
	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.	☐
		☐		☐		☐
		☐		☐		☐

Name Class Date

	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.	
C14.3 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.	☐

Lesson	Aiming for 4	Aiming for 6		Aiming for 8	
C14.4 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	☐
		I can explain the need for new ways of extracting metals (in particular copper).	☐	I can evaluate biological methods of metal extraction.	☐

AQA GCSE Chemistry

Student checklist

C3

Name _____ Class _____ Date _____

Lesson	Aiming for 4		Aiming for 6		Aiming for 8	
					equations.	
C7.5 Chemical cells and batteries	I can describe a battery.	☐	I can interpret data from an electrochemical cell to determine the reactivity of the metals involved.	☐	I can explain why the reactions in an electrochemical cell are redox reactions and determine which species is oxidised or reduced in an electrochemical cell.	☐
	I can give an example of a non-rechargeable battery.	☐	I can explain why non-rechargeable batteries stop working.	☐	I can evaluate the use of non-rechargeable batteries.	☐
C7.6 Fuels cells	I can describe a hydrogen fuel cell.	☐	I can explain how a hydrogen fuel cell produces electricity.	☐	I can describe the reactions in fuel cells using balanced symbol and half equations.	☐
	I can state some uses for hydrogen fuel cells.	☐	I can list the advantages and disadvantages of hydrogen fuel cells.	☐	I can evaluate the use of hydrogen fuel cells instead of rechargeable cells and batteries.	☐
	I can state that hydrogen fuel cells could be an alternative to rechargeable cells and batteries.	☐	I can explain why hydrogen fuel cells are an alternative to rechargeable cells and batteries.	☐	I can determine and explain which species is oxidised and which is reduced in a hydrogen fuel cell	☐

AQA GCSE Chemistry

Student checklist

C3

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

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.	☐

AQA GCSE Chemistry

Student checklist

C3

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

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	☐
			I can plan and carry out an electrolysis investigation.	☐	I can explain the classification of the reactions at each electrode as oxidation or reduction.	☐

	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.	☐

AQA GCSE Chemistry

Student checklist

C3

Name _____ Class _____ Date _____

C5.1 The reactivity series	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.	☐	I can describe displacement reactions using an ionic equation. (H)	☐
	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.	☐	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. (H)	☐
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.	☐

Lesson	Aiming for 4	Aiming for 6	Aiming for 8

AQA GCSE Chemistry

Student checklist

C3

Name _____ Class _____ Date _____

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.	☐
C4.4 Yield of a chemical reaction	I can state the definition of theoretical yield, actual yield, and percentage yield.	☐	I can calculate percentage yield when the actual yield is given and the mass of the limiting reactant is given.	☐	I can calculate the percentage yield using a variety of units and conversions.	☐
	I can calculate percentage yield when actual yield and theoretical yield are given.	☐	I can list reasons why actual yield is often lower than theoretical yield.	☐	I can justify why percentage yield can never be above 100%.	☐
	I can calculate the formula mass of substances when the formula is given.	☐	I can calculate the atom economy for a given chemical reaction.	☐	I can evaluate different reactions to decide the best production method of a chemical.	☐

AQA GCSE Chemistry

Student checklist

C3

Name _____ Class _____ Date _____

C4.5 Atom economy	I can recognise a covalent compound from its formula, name, or diagram showing bonds.	☐	I can explain why using reactions with high atom economy is important.	☐	I can explain why the sum of the formula masses of the reactants is the same as the sum of the formula masses of the products.	☐
	I can state a definition of atom economy.	☐				