



# AQA GCSE Combined Science: Trilogy

## Topic Checklists

### 5.1 Atomic Structure and the Periodic Table

#### 5.1.1 A Simple Model of the Atom, Symbols, Relative Atomic Mass, Electronic Charge and Isotopes

Topic	Success Criteria	Progress		
Atoms, Elements and Compounds	I can give a definition for the term 'atom'.			
	I can give a definition for the term 'element'.			
	I can identify an element from its chemical symbol using the periodic table.			
	I can use the names and symbols of the first 20 elements, the elements in Groups 1 and 7 and other key elements.			
	I can give a definition for the term 'compound'.			
	I can explain how compounds are formed.			
	I can name compounds from given formulae or symbol equations.			
	I can write word equations for given chemical reactions.			
	I can write formulae and balanced symbol equations for given chemical reactions.			
(HT only) I can write balanced half equations and ionic equations where appropriate.				
Mixtures	I can give a definition for the term 'mixture'.			
	I can describe the physical processes used to separate mixtures.			
	I can explain how each process works to separate a mixture.			
	I can give examples of mixtures that can be separated by each of the processes.			
	I can suggest suitable separation and purification techniques for mixtures when given appropriate information.			
I can safely use a range of equipment to separate chemical mixtures.				

Topic	Success Criteria	Progress		
The Development of the Model of the Atom	I can describe what atoms were thought to be like before the discovery of the electron.			
	I can describe the difference between the plum pudding model of the atom and the nuclear model of the atom.			
	I can describe how the results from the alpha particle scattering experiment led to the nuclear model.			
	I can describe how Niels Bohr adapted the nuclear model.			
	I can describe how developments in scientific methods led to the discovery of protons and neutrons.			
Relative Electrical Charges of Subatomic Particles	I can state the relative electrical charge of a proton.			
	I can state the relative electrical charge of a neutron.			
	I can state the relative electrical charge of an electron.			
	I can explain why atoms have no overall electrical charge.			
	I can describe how the number of protons in an element relates to its atomic number.			
	I can use the nuclear model to describe atoms.			
Size and Mass of Atoms	I can state the radius of an atom.			
	I can describe how the radius of a nucleus compares to the radius of an atom.			
	I can state the relative mass of a proton.			
	I can state the relative mass of a neutron.			
	I can state the relative mass of an electron.			
	I can describe how the number of protons and neutrons in an atom relate to its mass number.			
	I can give a definition for the term 'isotope'.			
	I can identify the atomic number and mass number of an atom of an element using the periodic table.			
	I can calculate the number of protons, neutrons and electrons in an atom or ion, given its atomic number and mass number.			
	I can relate the size and scale of atoms to objects in the physical world.			



Topic	Success Criteria	Progress		
Relative Atomic Mass	I can explain how relative atomic mass is calculated based on the abundance of the isotopes of the element.			
	I can calculate the relative atomic mass of an element given the percentage abundance of its isotopes.			
Electronic Structure	I can represent the electronic structures of the first 20 elements of the periodic table in numerical form.			
	I can represent the electronic structures of the first 20 elements of the periodic table as a diagram.			



**5.1.2 The Periodic Table**

<b>Topic</b>	<b>Success Criteria</b>	<b>Progress</b>		
The Periodic Table	I can describe how elements are arranged in the periodic table.			
	I can explain why elements in the same group of the periodic table have similar chemical properties.			
	I can explain how the position of an element in the periodic table is related to the arrangement of electrons in its atoms and hence to its atomic number.			
	I can predict possible reactions and probable reactivity of elements from their positions in the periodic table.			
Development of the Periodic Table	I can describe how scientists attempted to classify the elements before the discovery of protons, neutrons and electrons.			
	I can describe some of the problems with early periodic tables.			
	I can explain how Mendeleev overcame some of the problems with early periodic tables.			
Metals and Non-Metals	I can state the charge of ions formed by elements that are metals.			
	I can state the charge of ions formed by elements that are non-metals.			
	I can describe where metals are found on the periodic table.			
	I can describe where non-metals are found on the periodic table.			
	I can explain the differences between metals and non-metals on the basis of their characteristic physical and chemical properties.			
	I can explain how the atomic structure of metals and non-metals relates to their position in the periodic table.			
	I can explain how the reactions of elements are related to the arrangement of electrons in their atoms and hence to their atomic number.			



Topic	Success Criteria	Progress		
Group 0	I can recall the general name for the elements in Group 0 of the periodic table.			
	I can state the number of electrons in the outer shell of the noble gases (excluding helium).			
	I can describe how helium differs from the other elements in the group.			
	I can explain why the noble gases are unreactive and do not easily form molecules.			
	I can describe how the boiling points of the noble gases change as you go down the group.			
	I can explain how the properties of the noble gases depend on the outer shell of electrons of the atoms.			
	I can predict properties from given trends down the group.			
Group 1	I can recall the general name of the elements in Group 1 of the periodic table.			
	I can state the number of electrons in the outer shell of the alkali metals.			
	I can describe the reactions of the first three alkali metals with oxygen.			
	I can describe the reactions of the first three alkali metals with chlorine.			
	I can describe the reactions of the first three alkali metals with water.			
	I can describe how the reactivity of the alkali metals changes as you go down the group.			
	I can explain how the properties of the alkali metals depend on the outer shell of electrons of the atoms.			
I can predict properties from given trends down the group.				



Topic	Success Criteria	Progress		
Group 7	I can recall the general name for the elements in Group 7 of the periodic table.			
	I can state the number of electrons in the outer shell of the halogens.			
	I can describe the nature of the compounds formed when chlorine, bromine and iodine react with metals.			
	I can describe the nature of the compounds formed when chlorine, bromine and iodine react with non-metals.			
	I can describe how the relative molecular mass, melting point and boiling point of the halogens change as you go down the group.			
	I can describe how the reactivity of the halogens changes as you go down the group.			
	I can describe what happens when a more reactive halogen reacts with an aqueous solution of a salt containing a less reactive halogen.			
	I can explain how the properties of the halogens depend on the outer shell of electrons of the atoms.			
	I can predict properties from given trends down the group.			