

KS3 Chemistry – Atoms, Elements, Compounds – Learning Objectives

	Beginning	Developing	Secure	Embedding	Extending	Excelling	
Periodic Table	Recall that the Periodic Table shows the names of all chemical elements. Know the names and symbols of some common elements.	Understand that an atom of an element is different from the atoms of any other element. Describe the properties that distinguish elements as metals or non-metals.	Recognise that the elements are arranged in the Periodic Table in order of increasing atomic number, and that trends in reactivity can be found in the groups (columns).	Describe the trends in reactivity shown by the groups of the Periodic Table. Evaluate earlier versions of the Periodic Table, identifying the reasons for the arrangements and the limitations; discuss why Mendeleev's table was the most successful.		-	
Compounds & Mixtures	Describe some differences between atoms of an element, compounds and mixtures. Recognise that molecules may be an element or a compound.	Explain the differences between atoms, compounds and mixtures, in terms of particles. Describe how substances in a mixture behave as if they were on their own, but properties of their compound may be different. Know how to name compounds correctly from a formula, and how to identify the elements present from a compound's name.		-	-	-	
Phys / Chem Changes	-	State that physical changes are easy to reverse, and may involve a change of state. State that chemical changes form new compounds, and cannot easily be reversed. Give some examples of chemical and physical changes.		Describe physical and chemical changes in terms of energy supplied / released to the substance.		-	
Conserving Mass	-	Recall that in all chemical changes, no additional mass is gained, and no mass is lost.	Explain that the mass of products in a reaction may increase if something has been gained from outside the reaction container (eg. oxygen from the air is needed for burning). Explain that the mass of products in a reaction may decrease if something is lost from the container (eg. releasing a gas).		Give examples of chemical reactions where mass is gained, lost, or stays the same.		-
Burning Metals	-	-	Apply previous knowledge of elements and compounds, chemical changes and conservation of mass to a simple chemical reaction. Form a word equation (or unbalanced symbol equation) to show the reactants and products in a reaction.		Complete an accurately balanced symbol equation for a reaction.		-
Atomic Structure	Recall that atoms are made from protons, neutrons and electrons; the number of protons determines the element.	Recall the structure of the atom – protons and neutrons in the nucleus, and electrons orbiting in shells.	Use atomic number and mass number to identify how many protons, neutrons and electrons are present in an atom.	Demonstrate how electrons are correctly arranged in shells orbiting the nucleus, for the first twenty elements. Determine the electronic structure for the first twenty elements using the numeric format.		-	
Valency	-	-	-	Identify the valencies of metals and non-metals using their group numbers. Determine simple formulae for compounds using valencies.	Understand how positive and negative ions are formed, by losing or gaining electrons from the outer shell. Determine more complicated formulae for compounds using valencies (this may include the use of complex ions, for which the symbols are provided).		

* Objectives covering more than one grade are assessed based on the level of scientific detail and language used by the learner.