



Key Vocabulary

1	Atom	The smallest unit of matter and part of which an element can be broken down into. Have a radius of approx 0.1nm. Have no overall charge. Approx 100 diff atoms.
2	Element	A substance made up of only one type of atom, which cannot be chemically broken into other substances. Represented by unique symbols Eg: Na. Approx 100 different elements.
3	Compound	A substance made of two or more elements that have bonded chemically. These atoms are usually, but not always, joined in molecules. Can only be separated into elements by chemical reactions. The compound has different physical properties to the elements of which they are made.
4	Mixture	Two or more elements or compounds, not chemically bonded together. Can be separated by physical processes.
5	Mass number	The sum of the protons and neutrons in the nucleus
6	Atomic number	The number of protons in the atom. Number of protons = Number of electrons
7	Nucleus	The center of an atom, a region where protons and neutrons are located. The nucleus accounts for the atomic mass. Radius=less than 1/10000 ($1 \times 10^{-14}m$) of atom
8	Neutron	A subatomic particle that has no charge. Found in the nucleus.
9	Proton	A positively charged particle in an atom. The number of protons in the nucleus of an atom is the atomic number of an element.
10	Electron	A negatively charged particle in an atom.
11	Polymer	A substance made from large molecules made up of many repeating units (monomers). Can be natural eg: wool, cotton or synthetic eg: polyethene, nylon
12	Period	Rows of the periodic table of elements. These represent the number of energy levels for electrons in atoms of the elements. Eg: Na- period 3
13	Groups	Columns on the periodic table of elements, ordered according to the numbers of electrons in the outer shells of the atoms of each element Eg: Na- group 1- 1 electron in outer shell

The atom

1	The atom				<p>● Proton</p> <p>● Neutron</p> <p>● Electron</p>
2	Subatomic particles	Name of particle	Relative charge	Relative mass	
		Proton	+1	1	
		Neutron	0	1	
		Electron	-1	Very small	

3	Mass number (Total of protons + neutrons in)	
	Atomic number (number of protons = no of electrons)	

Noble gases (Group 0)

1	Noble gases names	Helium, Neon, Argon, Krypton, Xenon, Radon
2	Properties	Colourless, odourless, all non metals
3	Trends	<p>Boiling points increase down group (low mp/bp- gases at room temp)</p> <p>Density increases down group</p> <p>Unreactive- have a full outer shell of electrons</p>
4	Uses	Helium-Balloons, Neon-glowing light tubes/lasers (red), Argon-light bulbs, Krypton-laser eye surgery, Xenon-light tubes, Radon-radiotherapy

The periodic table

groups 0 to 7

Alkali metals

Transition metals

Halogens

Noble gases

periods 1 to 6

Organised into groups and periods. Elements in the same group follow the same trends in properties eg: mp, bp, reactivity. Groups allow scientists to make predictions about element properties. Metals are on the left and non-metals are on the right (separated by thick black ladder line)

Halogen (Group 7)

1	Halogen names	Fluorine, Chlorine, Bromine, Iodine, Astatine
2	Properties	Fluorine and Chlorine – Gases, Bromine-Liquid, Iodine and Astatine- Solids Don't conduct electricity
3	Trends	<p>Melting and boiling points increase as you move down the group (generally low mp/bp)</p> <p>Involved in displacement reactions</p> <p>Like to react with group 7 elements</p> <p>Relatively low mp's and bp's</p>
4	Reactions	<p>React in similar ways to each other. Eg:</p> <p>$iron + chlorine \rightarrow iron\ chloride$</p> <p>$iron + bromine \rightarrow iron\ bromide$</p>
5	Displacement reactions	<p>A more reactive halogen takes the place of a less reactive halogen. The most reactive are at the top of the group and least reactive at the bottom. If the most reactive halogen is on its own it will take the place of a less reactive halogen in a compound</p> <p>$calcium\ bromide + chlorine \rightarrow calcium\ chloride + bromine$</p>

Chemical formulae

1 Tell us how many atoms of each element are in the compound in relation to each other. The small number tells us the number of each element.

CH_4
carbon 4 hydrogens

CO_2
1 carbon 2 oxygens

2 Naming compounds

Always mention the metal first, then the non metal second.
The name of the metal does not change but the name of the non metal does change eg: Oxygen changes to oxide

Alkali metals (Group 1)

1	Alkali metals	Lithium, Sodium, Potassium, Rubidium, Caesium, Francium
2	Reactions	<p>Elements in group 1 react with water to form alkaline compounds. This is why they are called alkali metals.</p> <p>$lithium + water \rightarrow lithium\ hydroxide + hydrogen$</p> <p>$metal + water \rightarrow metal\ hydroxide + hydrogen$</p> <p>Very reactive with oxygen, water and chlorine (stored in oil so do not react with air)</p>
3	Properties and trends	<p>Soft, low density, shiny when freshly cut, good conductors of electricity and heat, low mp/bp</p> <p>More reactive down group, mp's/bp's decrease down group</p> <p>Lower melting and boiling point the further down the group</p>