

Atoms and elements

Elements

An **element** is a simple substance that cannot be split into anything simpler by chemical reactions. **Atoms** are the smallest particles of an element that can exist. Atoms of one element are all the same, and are different from atoms of all the other elements.

There are over 100 different elements. All the elements are shown in the **Periodic Table**. Each element has a **chemical symbol**, which is usually one or two letters. A symbol is written with the first letter as a capital, and the second letter is small.

carbon	C	oxygen	O
nitrogen	N	hydrogen	H
gold	Au	silver	Ag
copper	Cu	aluminium	Al

Metals and non-metals

The **properties** of a substance are the words that we use to describe it, or measurements that we can make on it. **Metals** and **non-metals** have different properties.

Metals	Non-metals
good conductors of heat and electricity	poor conductors of heat and electricity
shiny	dull
solids with a high melting point (except for mercury)	most are solids or gases
found on the left-hand side of the Periodic Table	found on the right-hand side of the Periodic Table
three metals are magnetic	no non-metals are magnetic
metals can burn to form alkaline oxides	non-metals can burn to form acidic oxides
flexible	brittle

Compounds

Elements can join together to make compounds. The name of the compound tells you the elements that are in it. Compounds made from two elements always have a name which ends in '**-ide**'.

These elements join together to make these compounds
carbon, oxygen	carbon dioxide
sodium, chlorine	sodium chloride
magnesium, oxygen	magnesium oxide

A chemical formula tells you the name and number of atoms in a compound. The smallest particle of many compounds is called a **molecule**. Molecules are made up of atoms. Some elements are also made of molecules. For example, a molecule of oxygen contains two oxygen atoms joined together. The formula is O₂.

Elements	Compounds	Mixtures
atoms of helium (He) 	molecules of carbon dioxide (CO ₂) 	a mixture of helium and oxygen
molecules of oxygen (O ₂) 	molecules of water (H ₂ O) 	a mixture of carbon dioxide and oxygen
a lump of carbon (C) 	a lump of sodium chloride (NaCl) 	a lump of bronze (an alloy of copper and tin)