

## 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.

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

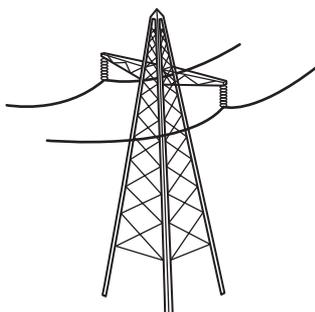
## Metals and non-metals

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.

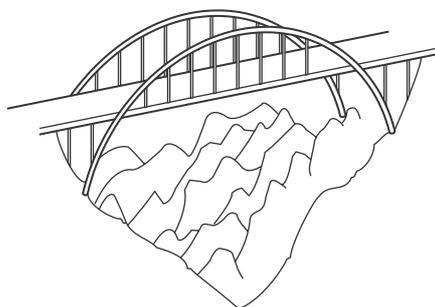
Metals	Non-metals
Good <b>conductors</b> of heat and electricity	Poor <b>conductors</b> of heat and electricity
<b>Shiny</b>	Dull
<b>Solids</b> with a <b>high melting point</b> (except for mercury)	Most are solids or gases
Found on the left-hand side of the <b>Periodic Table</b>	Found on the right-hand side of the <b>Periodic Table</b>
Three metals are <b>magnetic</b>	No non-metals are magnetic
Metals can burn to form alkaline oxides	Non-metals can burn to form acidic compounds
Flexible	Brittle

## Using metals

Metals and non-metals have different uses because of their different properties.



Aluminium is used for power lines because it is light and it is a good conductor of electricity



Iron and steel are used for bridges because they are strong and cheap



Gold is used for jewellery because it does not corrode and looks nice

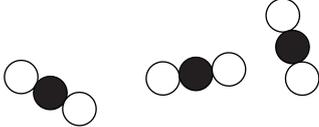
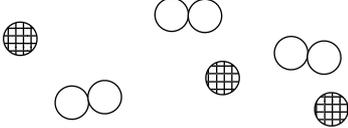
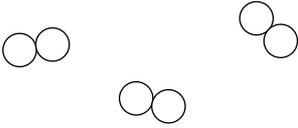
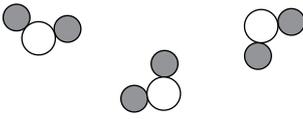
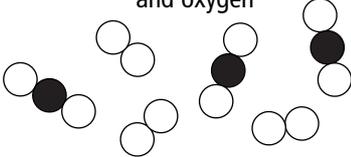
## Compounds

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

Elements and compounds can also be mixed together. A **mixture** is usually easier to separate than the elements in a compound. Soil, air, river water and sea water are examples of mixtures that occur naturally. Pure water, common salt and carbon dioxide are examples of compounds.

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  $O_2$ .

Elements	Compounds	Mixtures
<p>Atoms of helium (He)</p> 	<p>Molecules of carbon dioxide (<math>CO_2</math>)</p> 	<p>A mixture of helium and oxygen</p> 
<p>Molecules of oxygen (<math>O_2</math>)</p> 	<p>Molecules of water (<math>H_2O</math>)</p> 	<p>A mixture of carbon dioxide and oxygen</p> 
<p>A lump of carbon (C)</p> 	<p>A lump of sodium chloride (NaCl)</p> 