

# SUBJECT: Science

## UNIT: Y7 Elements



### Key Vocabulary

#### **Reactant**

The chemical present at the start of a reaction. Reactants appear on the left of a chemical equation, before the arrow  $\rightarrow$ .

#### **Product**

A chemical which is made in a chemical reaction. Products are written on the right of a chemical equation, after the arrow ( $\rightarrow$ ).

#### **Chemical Reactions**

When chemical bonds are broken and made between atoms, so that new substances (compounds or elements) are made.

#### **Substance**

Matter made of a fixed ratio of atoms with characteristic properties.

### Word Equations

- *Reactants* always go first in word equations, and the names of the reactants are separated using + symbols.
- After the reactants, there is an arrow,  $\rightarrow$ , to show that the chemical reaction has taken place.
- The *products* are written after the arrow, separated by + symbols.
- Words like *powder*, *solution* or *gas*, are **not** included in word equations.

### Elements

Atoms are the building blocks of everything. Atoms can form strong bonds with each other, making *molecules*.

A pure substance made from only one type of atom is called an element. Elements are listed on the periodic table. Elements can combine to make compounds.

### Atoms

Atoms are the building blocks of all matter. Everything is made of atoms - even yourself.

Atoms are the smallest particle of an *element*, which are far too small to see.

### Elements

An element is a pure substance which is made from only one type of atom. Everything in the universe contains the atoms of one or more elements. The atoms in one element are all the same as each other, but they are different from the atoms of any other elements. There are 118 different elements. They are listed on the *periodic table*. Examples of elements include oxygen, hydrogen and carbon.

### Chemical Formula

Elements are represented by letters from the alphabet. These letters are also known as symbols. The symbol for an element is either a single capital letter or a capital letter followed by a lower case letter.

A compound is a substance that contains atoms of two or more different elements.

The elements are chemically bonded together in a specific *ratio* of atoms.

The formula of a compound shows how many atoms of each element are bonded together. The formula is made up of symbols and numbers.

The numbers are written as **subscript**, which means they are smaller than the symbol, and slightly lower down. For example, the formula for water is  $\text{H}_2\text{O}$ .

### Ambitious Vocabulary

Molecule, Periodic Table, Elements

### Compounds

Molecules are made when two or more atoms chemically bond together. Atoms from different elements can combine. When the atoms are from different elements, the molecule can also be called a compound. Water is made of molecules. Each water molecule is made from two hydrogen atoms chemically bonded to one oxygen atom. This means that the chemical formula of water is  $\text{H}_2\text{O}$ . Carbon dioxide is made of molecules of a carbon atom bonded to two oxygen atoms ( $\text{CO}_2$ ).

### RFM

The relative formula mass of a substance made up of *molecules* is the sum of the relative atomic masses of the atoms in the numbers shown in the *formula*.

Relative formula mass has the symbol,  $M_r$ . To calculate the  $M_r$  for a substance:

1. work out how many atoms of each element there are in the chemical formula
2. add together the  $A_r$  values for all the atoms of each element present

For example, the formula for carbon dioxide is  $\text{CO}_2$ . It consists of one carbon atom ( $A_r = 12$ ) and two oxygen atoms ( $A_r = 16$ ):

$$M_r \text{ of } \text{CO}_2 = 12 + 16 + 16 = 44$$