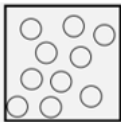


# Year 7 Science: Spring: Atoms, Elements and Compounds

## Elements

- All substances are composed of atoms
- Elements are made from only **one type of atom**.



e.g. this diagram shows an element because it is made from only one type of atom.

- There are about 100 different elements
- An atom is the smallest part of an element that can exist
- Elements have specific physical and chemical properties
- Physical properties** = state, appearance, smell, magnetic, etc.
- Chemical properties** = what it reacts with and how reactive it is

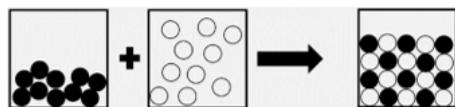
## Periodic Table

- Elements are organised in the Periodic Table
- The Periodic Table is organised into periods and groups
- Groups** are vertical columns
- Periods** are horizontal rows
- Elements in a group have similar chemical properties
- Metals** are on the left hand side of the 'staircase' and **non-metals** are on the right hand side of the 'staircase'.

## Compounds

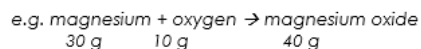
- Compounds are formed from elements by chemical reactions
- Chemical reactions always involve the production of one or more new substances

e.g. in the diagram below there are two elements that when they react together, make a new compound



liquid element    gas element    solid compound

- When two elements react to form a compound, the masses of the reacting elements is equal to the mass of the compound produced. This is the law of **conservation of mass**.



- A compound contains two or more elements chemically joined together in fixed proportions
- A compound has different properties from the elements it's composed
- Compounds can only be separated into elements by chemical reactions
- A **molecule** is two or more non-metal atoms chemically joined together – this can be an element (e.g. H<sub>2</sub>) or a compound (e.g. H<sub>2</sub>O)

## Hazard symbols



## Naming compounds

- There are rules to follow when naming compounds:
  - Usually the metal goes first and the non-metal goes second
  - If a metal and a non-metal react, the name of the non-metal ends in **-ide**
  - For some compounds, if there are a different number of atoms we add in '**mono**' for 1, '**di**' for 2 and '**tri**' for 3
  - If the compound names ends in **-ate** then it usually contains three elements, including a non-metal and oxygen

## Chemical formulae

- Each element is represented by a chemical symbol.
 

e.g. Iron = Fe, oxygen = O, magnesium = Mg, gold = Au
- The chemical formula of a molecule or compound tells you which elements and how many atoms of each are in one molecule
- The small subscript number after an element symbol is the number of atoms of that element are in one molecule
 

e.g. In HNO<sub>3</sub> there is 1 atom of hydrogen, 1 atom of nitrogen and 3 atoms of oxygen per molecule.