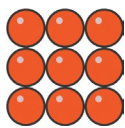




Atoms, Elements & Compounds



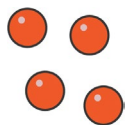
States of Matter



Solids: regular pattern, with all particles touching. Particles **vibrate** in their position.

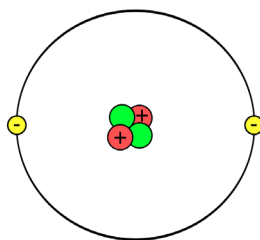


Liquids: irregular pattern, with all particles touching. Particles are touching and **can flow** around each other.



Gases: random pattern, with all particles spaced out. They **can be compressed**. Particles move at different speeds in different directions.

Structure of Atoms



An atom actually contains three much smaller particles.

Proton (positive)

Electron (negative)

Neutron (neutral)

There 118 different elements on the periodic table. This means there are 118 different types of atom.

All atoms have an overall neutral charge as they have the same number of protons and electrons.

Elements

- An **element** is a substance which is made up of only **one type of atom**.
- There are 118 different elements. They are all organised on the periodic table.
- Each element has its own unique formula, represented by either one capital letter, or a capital letter followed by a lower-case letter.
- For example, the formula for Oxygen is O. The formula for Iron is Fe.
- Another example: Potassium's formula is K, Sodium's formula is Na.

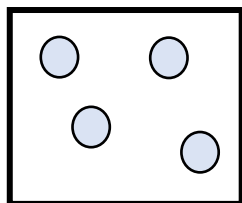
Compounds

- A **compound** is a substance made up of two or more elements which have **bonded together**.
- When elements bond together to make compounds their properties change.
- You can recognise a compound by the end of the second elements name changing.
- For example, Magnesium and Oxygen reacting together will make Magnesium Oxide.
- You can recognise the chemical formula for compounds by spotting capital letters next to each other.
- For example, in this formula MgOH, you can count three capital letters. So there are three elements bonded together (Mg = Magnesium, O = Oxygen, H = Hydrogen).

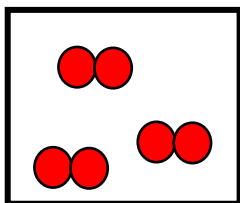
Mixtures

- A **mixture** is a substance where two or more different elements or compounds are **not** chemically bonded together.
- Mixtures can be separated using physical processes (such as evaporating salt water to separate salt and water).

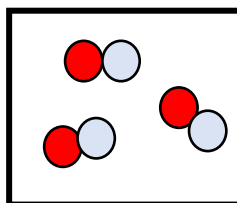
Particle Diagrams



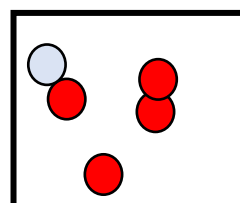
Element



Element



Compound



Mixtures

Molecules: a group of atoms together can be referred to as a molecule.

For example: O_2 is a molecule of oxygen, H_2O is a molecule of water.



CORE Questions



The following are core questions for this topic. Cover the answer section with a sheet of paper and try and quiz yourself. Only try learning 5 at a time, once you know them move on.

1	True or False. A particle is a tiny unit of matter.	TRUE
2	What are the three states of matter?	Solid, liquid and gas
3	Which state of matter is arranged in a regular pattern?	Solid
4	Which state of matter is arranged in a irregular pattern?	Liquid
5	Which state of matter is arranged in a random pattern?	Gas
6	Which state of matter vibrates?	Solid
7	Which states of matter flow?	Liquid and gas
8	True or False. Matter is a physical substance you can hold or contain.	TRUE
9	Name three particles found inside an atom.	Proton, neutron and electron.
10	Name the particle inside an atom which has a positive charge.	Proton
11	Name the particle inside an atom which has a negative charge.	Electron
12	Name the particle inside an atom which has no charge.	Neutron
13	Which two particles are found in the nucleus of an atom?	Proton and Neutron
14	Which particle is found on energy levels in an atom?	Electron
15	How many types of atoms are there?	118 (Elements from the periodic table)
16	State the definition of an element.	A substance which is made up of only one type of atom.
17	What does the periodic table show you?	All of the elements (118)
18	True or False. The majority of elements are non-metals.	FALSE
19	A student wrote the symbol for magnesium as MG. Explain why he is wrong.	It should be Mg. The first letter is always a captial, the second letter is lower case.
20	Use your perodic table to write the symbols for: Lithium, Sodium, Potassium, Oxygen, Hydrogen and Iron.	Lithium (Li), Sodium (Na), Potassium (K), Oxygen (O), Hydrogen (H) and Iron (Fe)
21	State the definition of a compound.	A substance made up of two or more elements, bonded together
22	State the definition of a mixture.	Two or more elements or compounds which can be separated
23	True or False. Air is an example of a compound.	False. Air is a mixture.
24	True or Flase. Oxygen is a compound.	Flase. Oxygen is an element
25	True or False. Magnesium Oxide is a compound.	True.
26	Name the compound formed when sodium reacts with oxygen.	Sodium Oxide
27	Name the compound formed when magnesium reacts with chlorine.	Magnesium Chloride
28	Use the periodic table. Name the elements in MgF2	Magnesium and Fluorine
29	Use the periodic table. Identify the elements in CaCO3	Calcium, Carbon and Oxygen
30	Use the periodic table. Identify the elements and the number of atoms for each element in CuCO3.	Copper - 1 atom, Carbon - 1 atom, Oxygen - 3 atoms
31	Use the periodic table. Identify the elements and the number of atoms for each element in H2O	Hydrogen - 2 atoms, Oxygen - 1 atom
32	Draw a particle diagram for a gas element.	One type of circle spread out.
33	Draw a particle diagram for a gas compound.	Two or more different coloured circles attached together and spread out.
34	Draw a particle digram for a mixture of gases.	Different coloured circles spread out but not touching.
35	True or False. Elements are pure substances but compounds are impure.	False. Elements and compounds are pure, mixtures are impure.
36	Give an example of an impure substance.	A mixture (or any mixture examples)