Key scientific ideas – particles

Particles can be of different sizes. This could explain how some chemicals can pass through membranes and others can’t.

|  |  |  |  |
| --- | --- | --- | --- |
|  | Solid | Liquid | Gas |
| Diagram |  |  |  |
| How are the particles arranged? | Fixed patten | Random | Random |
| How are the particles moving? | Vibrating on the spot | Moving over each other | Fast moving |
| How close are the particles? | Close | Close | Far apart |



The names of some compounds can tell you what elements are in them, for example compounds ending in:

 ....ate contain lots of oxygen

 ....ite contain some oxygen

 ....ide contain no oxygen (except for

 oxides and hydroxides)

Molecules are made of atoms joined together (bonded), for example, carbon dioxide.

**…and lots more**

Sodium chloride (NaCl)

Compounds can’t be separated easily.

Compounds have a fixed combination of different types of atoms.

There are just over 100 different elements.

Chlorine (CL2)

Sodium (Na)

Elements contain only one type of atom.

The particles nearest the flame begin to vibrate more.

**Conduction**

Gradually energy is transferred from particle to particle along the bar by vibration.

**This model can explain**

**Evaporation**

The fastest-moving particles escape from the surface of the liquid.

**Dissolving**

Particles from the solid break off and spread out amongst the particles of the liquid.

Carbon dioxide + Water

Natural gas + Oxygen
(Methane

Product

Reactants

**Chemical reactions**

**Conservation of mass. In a chemical reaction…**

Toaster

Reactants

Bread and oxygen

Product

Smoke and toast

Smoke

...there are the same number of particles at the end of the reaction as there were

at the beginning

...no particles get lost or destroyed ...

...the particles
are rearranged

in the reaction

...the products have the same mass as

the reactants

## Useful vocabulary

Particle Atom Displacement

Compressible Compound Equation

Diffusion Decompose Neutralisation

Expansion Element Product

Gas pressure Formula Reactant

Symbol Molecule Reactivity

 Mixture Salt

## Word equation

Methane + oxygen carbon dioxide + water

## Symbol equation

CH4 + 2O2 CO2 + 2H2O

Based upon an idea and approach developed by The Cams Hill Science Consortium