

KS3 Science

Year 7 – Matter

Additional keywords:

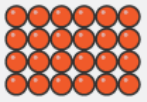


Sublime – change from a solid directly to a gas.

Solubility – Maximum mass of solute that dissolves in a certain volume of solvent.

States of Matter – SOLID

LIQUID

GAS

State	Solid	Liquid	Gas
Diagram			
Arrangement of particles	Regular arrangement	Randomly arranged	Randomly arranged
Movement of particles	Vibrate about a fixed position	Move around each other	Move quickly in all directions
Closeness of particles	Very close	Close	Far apart

[Video link](#)

The particles should be the same in all 3 diagrams.

Density

1 kg of a gas has a larger volume than 1 kg of a solid.
There is empty space between particles in a gas, but in a solid, they are tightly packed together.

$$\text{Density} = \text{Mass} / \text{Volume}$$

... so the density of the gas is much smaller than the density of the solid.

[Video link](#)

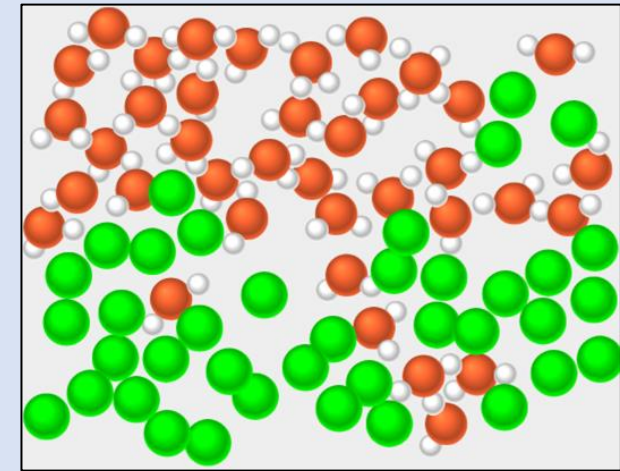
Dissolving

When the particles in a solid spread out in a liquid.

We call the liquid the SOLVENT



We call the solid the SOLUTE



We call the mixture of the solid and the liquid a SOLUTION.

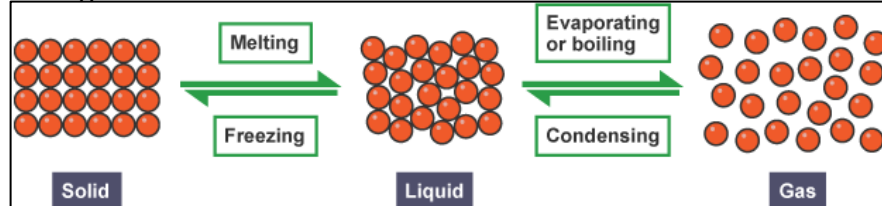
A solid that will dissolve in a liquid is called SOLUBLE.

A solid that will not dissolve in a liquid is called INSOLUBLE.

[Video link](#)

[Animation link](#)

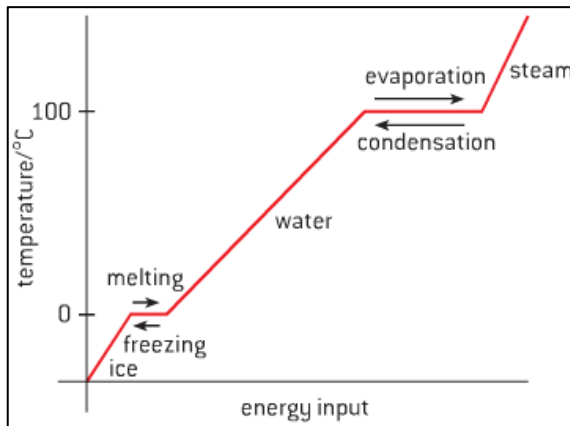
Changes of State



As a substance is heated it gains energy.

When the particles gain enough energy they overcome the forces between them.

Whilst a change of state is happening the temperature of the substance does not change. (flat line on graph)



[Video link](#)

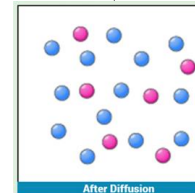
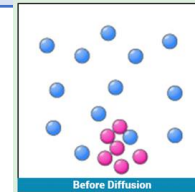
Diffusion

Particles in a liquid or a gas spread out from an area of high concentration to an area of low concentration until the concentrations are equal.

The higher the concentration gradient the faster the net diffusion.

The higher the temperature the faster the net diffusion.

If the particles that are spreading are water molecules we call this process osmosis.



[Video link](#)

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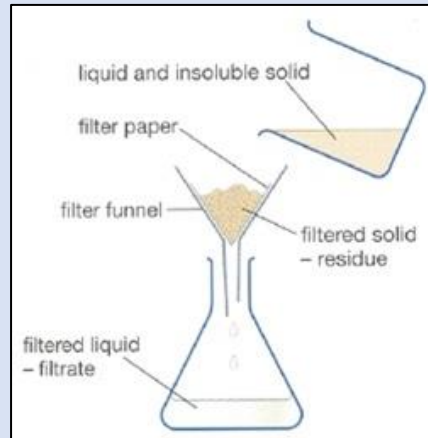
Additional keywords:

Gas pressure – caused by collisions of particles with the walls of a container

Filtration

Separates an insoluble solid from a liquid.

The solid pieces are too big to fit through the holes in the filter paper.

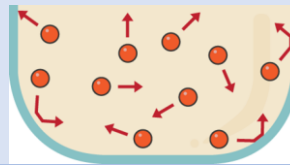


[Video link](#)

Gas Pressure

When gas particles hit the walls of their container they cause pressure.

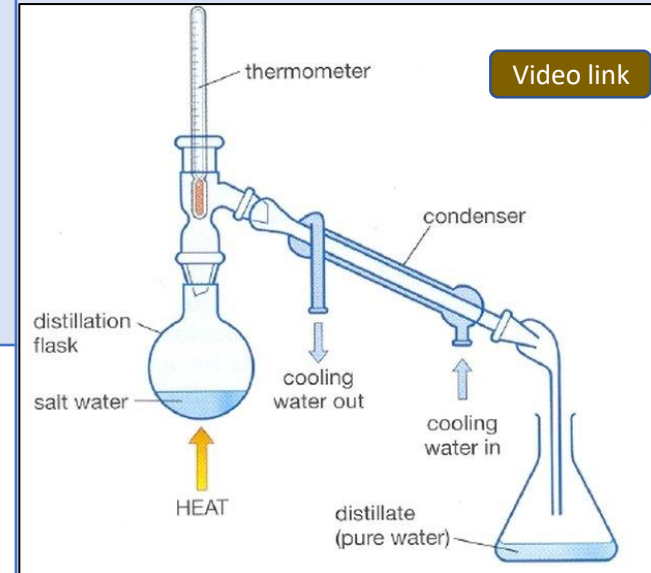
If temperature is increased, the particles in a gas move faster & hit the walls of the container more often. This causes the pressure to rise.



[Video link](#)

Distillation

Separating substances with different boiling points.



Chromatography

Method

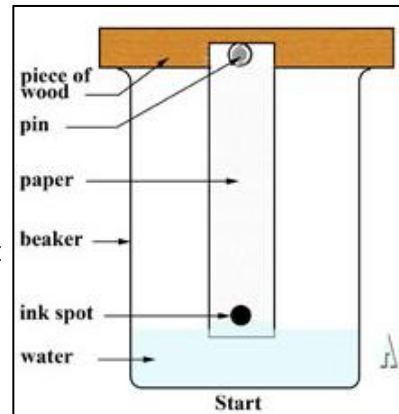
Draw pencil line.

Put dot of colour on line.

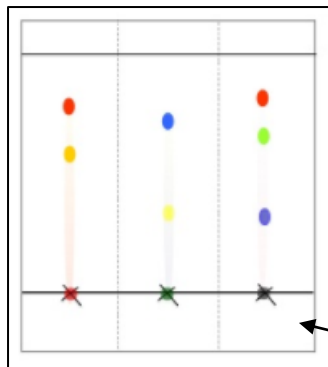
Hang bottom edge (below dot) in the water.

Leave until water soak up to almost the top of the paper..

Compare with known substances.



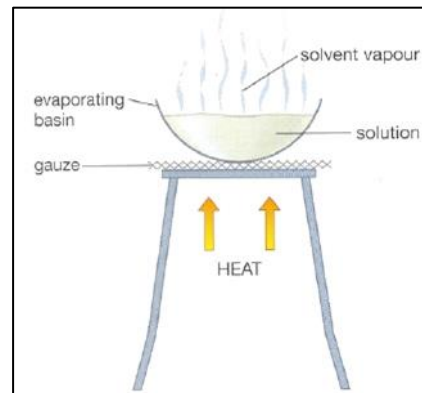
Different colours contain different mixtures of inks. The different inks move at different speeds up the paper. This is because of different solubility.



[Video link](#)

Evaporation

Separating a soluble solid from a liquid.



Crystallisation

Heat until almost all the water has evaporated.

Leave for the remaining water to evaporate slowly to form crystals.

[Video link](#)

Salt water mixture is heated.

At 100°C water boils and the particles gain enough energy to become a gas (water vapour).

Boiling point of salt is 1413°C so it does not boil and stays in the flask.

Water vapour rises and travels past the thermometer into the condenser.

Thermometer checks the temperature to identify the gas.

Condenser cools the water vapour so that it condenses back to liquid water.