

Solids, Liquids and Gases

SOLIDS:

- Stay in one place and you can hold them in your hand.
- Keep their shape. They do not flow like liquids.
- Always take up the same amount of space.
- Do not spread out like gases.
- Can be cut or shaped.

In a **solid**, the **particles** are closely packed together.



LIQUIDS:

- Can flow or be poured easily. They are not easy to hold.
- Change their shape depending on the container they are in.
- Even when liquids change their shape, they always take up the same amount of space. Their volume stays the same.

In a **liquid**, the **particles** are close together but free to move around.



GASES:

- Are often invisible.
- Do not keep their shape or always take up the same amount of space. They spread out and change their shape and volume to fill up whatever container they are in.
- Can be squashed.

In a **gas**, the **particles** are widely separated and can move freely.



Changing State

We can change **materials** from one state to another. We do this by **heating** or **cooling** the material.

Heating

Heat can change solids into **liquids** or **gases**.
Most solids **melt** into a liquid when they are heated.
A liquid **evaporates** into a gas when it is heated.

Cooling

When we **cool** something, we take heat away from it.
Cooling changes a gas into a liquid and a liquid into a solid. A gas **condenses** into a liquid when it is cooled.
A liquid **freezes** into a solid when it is cooled.



Different solids melt and freeze at **different temperatures**, some high, some low. These are called their **melting** or **freezing points**.

Different solids melt at different temperatures. Ice melts at 0 degrees Celcius (0°C). Metals, like aluminium and iron, also melt when we heat them. They have very high melting points. They have to be very hot to melt.

Temperature

Temperature is how hot or cold something is. Temperature is measured in degrees Celsius. This is shortened to °C.

We measure temperature with a **thermometer**.

Thermometers have a **scale** on the side so we can read the temperature.

The scale usually has a **line for each degree** but only multiples of 10 are written on.



Thermometers have a **liquid** in the bottom. When the liquid is **warmed**, it **expands** and rises in the glass tube.

When the **liquid cools**, it **contracts** and falls in the glass tube.

CAUTION

We need to be careful with thermometers! They are made from glass and will **break easily** if dropped or banged!

Key Vocabulary



CONDENSATION: Water vapour particles slow down, turn into water droplets and form clouds.



EVAPORATION: Water in oceans, lakes etc. is warmed up by the sun. The water particles move further apart until they become a gas (water vapour).



MELT: When a solid substance changes to a liquid due to heating.



PARTICLE: An extremely tiny piece of matter – everything in the universe is made up of particles.



PRECIPITATION: When enough water droplets group together in clouds, they fall to Earth as rain, snow, hail or sleet.



RUN-OFF: When water travels across land.



STATE: The structure or form of something (e.g. solid).



THERMOMETER: An instrument for measuring temperature.

The Water Cycle

