



# States of Matter

## Science

### Properties of solids



- Solids can be held.
- They keep their shape and do not flow.
- They always take up the same amount of space.
- They cannot be compressed.

#### Examples



metal



wood



plastic

### Properties of liquids



- Liquids cannot be held easily.
- They flow and can be poured.
- They take the shape of the container they are in.
- They cannot be compressed.

#### Examples



water



oil



milk

### Properties of gases



- Gases cannot be held.
- They have no fixed shape and fill the available space in the container.
- They can be compressed.
- They are normally invisible.

#### Examples



air



helium

### Melting and Boiling Points

When solid water (ice) is heated to  $0^{\circ}\text{C}$ , it begins to melt. This is called its melting point. When liquid water is heated to  $100^{\circ}\text{C}$ , it begins to evaporate. This is called its boiling point.

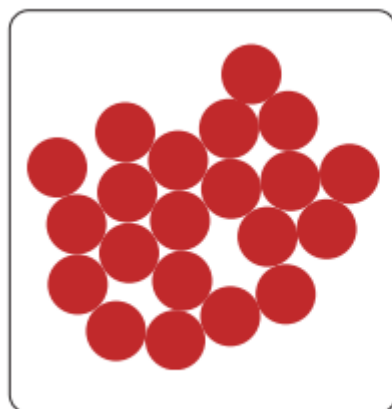
### Changing State

Materials can exist as solids, liquids or gases. Some materials change state when heat is added or removed. The processes involved in changing state are melting, freezing, evaporation and condensation.



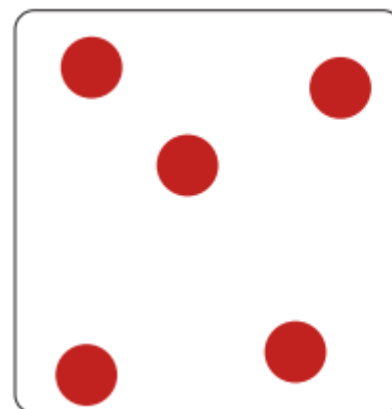
In a **solid**, the particles are close together, arranged in a regular pattern and cannot move around each other.

This arrangement means that solids keep their shape, always take up the same amount of space and cannot be compressed.



In a **liquid**, the particles are close together but arranged randomly, which means they can move around each other.

This arrangement means that liquids can flow, take the shape of the container and cannot be compressed.

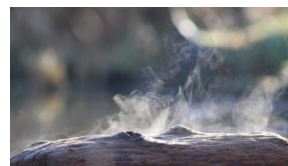


In a **gas**, the particles are far apart, randomly arranged and can freely move.

This arrangement means that gases have no fixed shape, fill any container and can be compressed.

## Glossary

Compress— To squash something.



Condensation— When a gas is cooled and changes into a liquid.

Evaporation—When a liquid is heated and changes into a gas.

Freezing—When a liquid is cooled and changes into a solid.

Irreversible— Incapable of being reversed back to its previous state.

Melting—When a solid is heated and changes into a liquid.



Reversible— Capable of being reversed back to its previous state.



Temperature—The measure of how cold or hot something is.

Variable— An object or condition that changes during an investigation.