Changing States of Matter







Year 4 Science

Week beginning Monday 8th March 2021

Everything is made up of tiny particles.

The properties of a substance depend on what its particles are like, how they move and how they are arranged.

The particles in a substance are the same whether it's in the solid, liquid or gas state, but their arrangement and movement change.



How do solids, liquids and gases differ?

Most substances can exist in three states: solid, liquid and gas. The particles of a substance are the same in each state, but their arrangement and movement change. This explains the different behaviour of a substance in its three states.

Solids

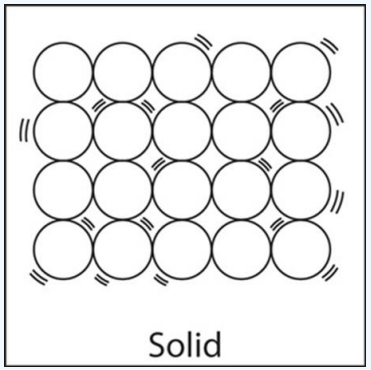
In the solid state the vibrating particles form a regular pattern. This explains the fixed shape of a solid and why it can't be compressed or poured.

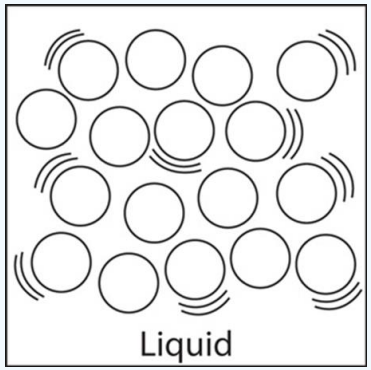
Liquids

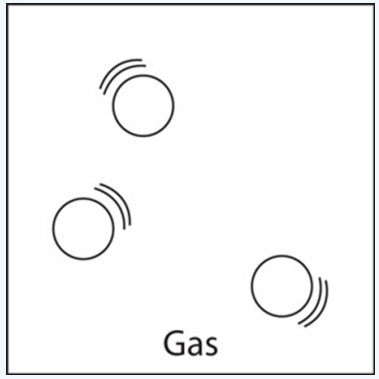
In a liquid the particles still touch their neighbours but they move around, sliding over each other. This is why you can pour, but not compress, a liquid.

Gases

In the gas state, widely-spaced particles move around randomly. This explains why you can compress gases and why they flow.







Boiling

Boiling is the term used to describe **liquid** turning to **gas** at a higher temperature than evaporation.

Different **liquids** boil at different temperatures.

You can see steam rising from boiling water as it is a mixture of water vapour and small droplets of water that make it visible.



What is the boiling point of water?

Condensation

Condensation is the scientific term for when a **gas** turns into a **liquid**.



You can see this happening in hot rooms when the water vapour in the air touches cold glass of a mirror or window.

The water vapour cools and turns into water droplets that make the glass look misty and cloudy.

Freezing

Freezing occurs when a **liquid** is made very cold and becomes a **solid**. When water is put into a freezer, it will become ice. Different elements and compounds have different freezing points.





At what temperature does water freeze?

Melting

Melting happens when a **solid** turns into a **liquid** from being heated.
Different solids melt at different temperatures.





Solidifying

Solidifying is when a **liquid** becomes a **solid**.

Some **liquids** do not need to be cold to solidify.

Chocolate is solid at room temperature. It does not need to be frozen or chilled to become solid again.



Melting Chocolate

Melting chocolate

A square of chocolate on a paper plate in a warm place. It took this long to melt:

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A square of chocolate on aluminium foil in a warm place took this long to melt:

.....

White chocolate



My body temperature is: .....

I held a square of chocolate in my hand. It took this long to melt:

.....

I put a square of chocolate in the fridge for **2 hours**. Then I held it in my hand. It took this long to melt:

.....

Can **white** chocolate change from solid to liquid?

.....

Melting Chocolate

Milk chocolate



A square of chocolate on a paper plate in a warm place. It took this long to melt:

A square of chocolate on aluminium foil in a warm place took this long to melt:

My body temperature is:

I held a square of chocolate in my hand. It took this long to melt:

I put a square of chocolate in the fridge for **2 hours**. Then I held it in my hand. It took this long to melt:

Can **milk** chocolate change from solid to liquid?

Dark chocolate



A square of chocolate on a paper plate in a warm place. It took this long to melt:

A square of chocolate on aluminium foil in a warm place took this long to melt:

My body temperature is:

I held a square of chocolate in my hand. It took this long to melt:

I put a square of chocolate in the fridge for **2 hours**. Then I held it in my hand. It took this long to melt:

Can **dark** chocolate change from solid to liquid?