

SMRP Knowledge Organiser for Year 4 'States of Matter'



Science knowledge

Materials are all made up of solids, liquids and gases. These are called **states of matter**. They are all made out of particles which are so small that they can't be seen with the human eye.

Particles in a solid are very close together and cannot move. They only vibrate.

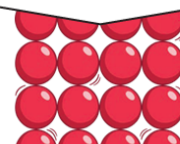
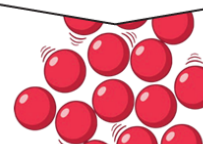
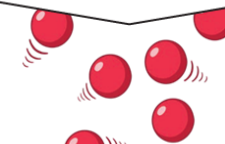
Liquid particles are close together but can move around each other easily.

Particles in a **gas** are spread out and can move around very quickly in all directions.

Matter can change from one state to another if heated or cooled. If ice (a solid) is heated it changes to water (a liquid). This change is called MELTING. If water is heated, it changes to steam (a gas).

Water from lakes, puddles, rivers and seas is evaporated by the sun's heat, turning it into water vapour. This water vapour rises, then cools down to form water droplets in clouds, this change is called condensation. When the droplets get too heavy, they fall back to the earth as rain, sleet, hail or snow.

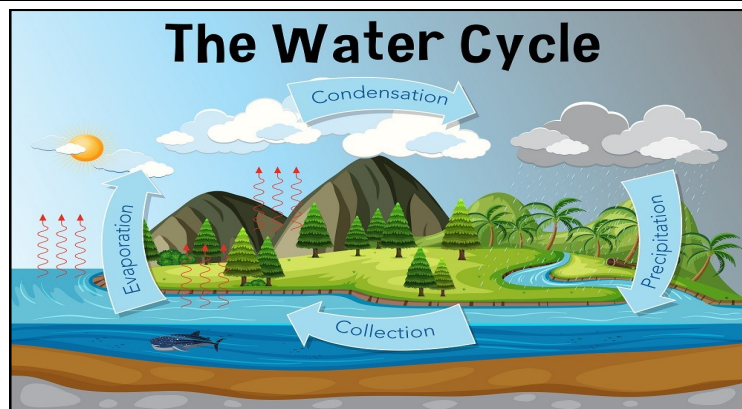
The Earth's **water cycle** began about 3.8 billion years ago and is something that happens continually.

Solid	Liquid	Gas
		
Particles in a solid are close together.	Particles in a liquid are able to move easily.	Particles in a gas can move in different directions.

This diagram shows the formation of particles in solids, liquids, and gases

Word	Definition
solid	When a material is in a solid state, it will hold its shape.
liquid	When a material is in a liquid state, it is able to flow freely.
gas	When a material is in a gas state, it is able to spread out and move in all directions.
heating	Raising temperature of something
freezing point	The freezing point of a particular substance is the temperature at which it freezes. The freezing point of water is 0°C.
temperature	A measure of how hot or cold something is.
particles	Particles are what materials are made from. They are so small that we cannot see them with our eyes.
evaporation	When a liquid changes state into a gas.
condensation	When a gas changes state into a liquid.
precipitation	liquid or solid particles that fall from a cloud as rain, sleet, hail or snow.
collection	This is when water that falls from the clouds as rain, snow, hail or sleet, collects in the oceans, rivers, lakes and streams.

This diagram shows the 4 stages of the water cycle.



A **material** can **change** from the gas **state** to the liquid **state** by condensing. Condensing happens at any temperature below the boiling point, but happens most readily at cold temperatures. These processes are linked in the water cycle .