States of Matter

Key Knowledge

You will learn:

That:

- Materials can be one of three states: solid, liquid or gas.
- Different materials have different melting points

How to:

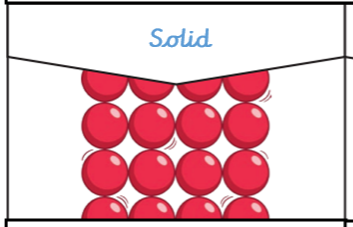
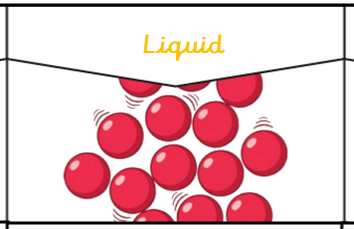
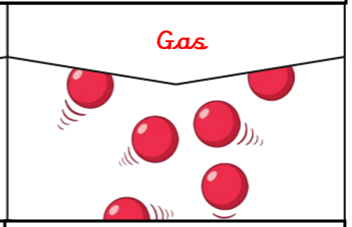
- Group materials according to their state e.g. solid, liquid or gas.
- Explain the particle structure of solids, liquids and gases.
- Use temperature to change the state of a substance such as chocolate, butter, cream.
- Watch and record evaporation over a period of time, for example, a puddle in the playground or washing on a line, and investigate the effect of temperature on washing drying or snowmen melting.
- Use data (tables, graphs) to show the effects of temperature on states of matter.
- Present what you know about the water cycle using a variety of skills using appropriate vocabulary (The Water Cycle Knowledge Organiser).

Key Vocabulary

Condensation	The process of turning a gas into a liquid.
Evaporation	The process of turning a liquid into a gas.
Freeze	Liquid turns to a solid during the freezing process.
Gas	Gases can spread out to completely fill the container or room they are in. They do not have any fixed shape but they do have a mass.
Irreversible change	When materials cannot be changed back to how they were before.
Liquid	Liquids take the shape of their container. They can change shape but do not change the amount of space they take up. They can flow or be poured.
Materials	The substance used to make something e.g. wood, plastic, metal etc.
Melting	When a solid changes to a liquid.
Mixture	A substance in which two or more substances are mixed but not chemically joined together.
Particle	Is the smallest possible unit of matter.
Precipitation	Liquid or solid particles that fall from a cloud as rain, sleet, hail or snow.
Reversible change	When materials can be changed back to how they were before the reaction took place.
Temperature	The amount of heat in something.
Solid	These are materials that keep their shape unless a force is applied to them. They can be hard, soft or even squashy. Solids take up the same amount of space no matter what has happened to them.
State of matter	Materials can be one of 3 states: solids, liquids or gases. Some materials can change from one state to another and back again.
Water vapour	This is water that takes the form of a gas.

Key Knowledge

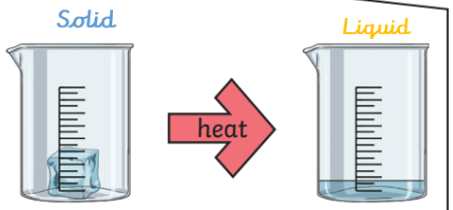
There are three states of matter

Solid	Liquid	Gas
		
Particles in a solid are close together and cannot move. They can only vibrate.	Particles in a liquid 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.

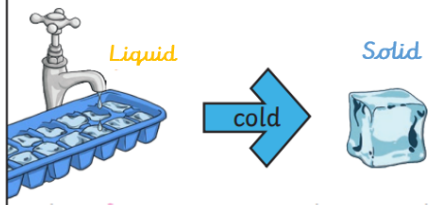
Changing States

The organisation of **particles** is different depending on what **state** the **material** is in.

When water and other liquids reach a certain temperature, they change state into a solid, liquid or gas. The temperatures that these changes happen are called boiling, melting or freezing point.



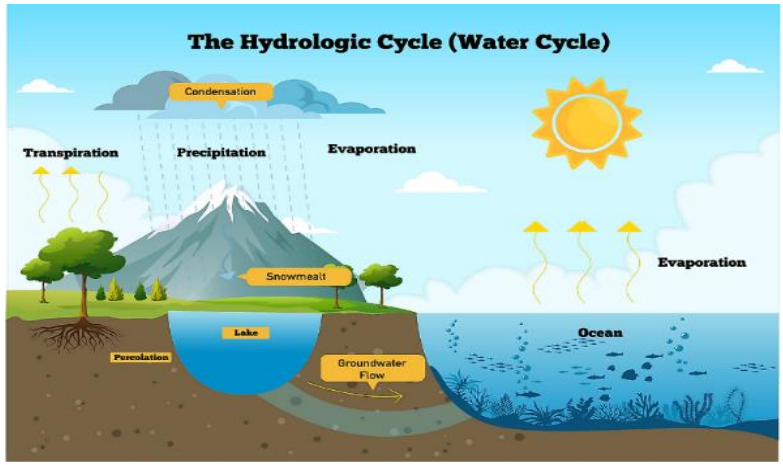
If a solid is heated to its melting point, it melts and changes to a liquid. This is because the particles start to move faster and faster until they are able to move over and around each other.



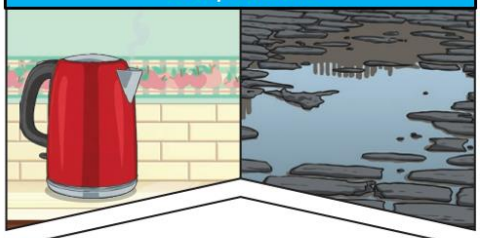
When freezing occurs, the particles in the liquid begin to slow down as they get colder and colder. They can then only gently vibrate on the spot, giving them a solid structure.

The Water Cycle

Changing **states** have a role to play in **the water cycle**. All the water on earth is constantly being recycled. See your Water Cycle Geography organiser for more.



Evaporation



Evaporation occurs when water turns into **water vapour**. This happens very quickly when the water is hot, like a kettle, but it can also happen slowly like a puddle evaporating in the warm

Condensation

Condensation is when **water vapour** is cooled down and turns into water. You can see this when droplets of water form on a window. The **water vapour** in the air cools when it touches the cold surface.

What you should already know...

In Year 1 you: grouped everyday materials based on their simple physical properties.

In Year 2 you: explored how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching

In Year 3 you: compared and grouped rocks by appearance and physical properties.