Year 4

Science

States of Matter

Key Knowledge

Materials ca be grouped into 3 categories: solids, liquids and gases.

Solids
- Solids stay in one place and can be held.
- Most solids keep their shape. They do not flow like liquids. Some solids like sand or salt can be poured.
- Solids always take up the same amount of space. They do not spread out like gases.

Liquids
- Liquids can **flow** or be **poured** easily. They are not easy to hold.
- Liquids change their shape depending on the container they are in.

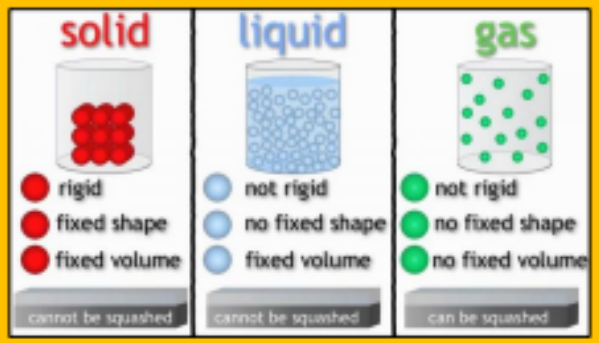
Gases
- Gases are often invisible.
- Gases do not keep their shape. They spread out and change their shape and volume to fill up whatever container they are in.

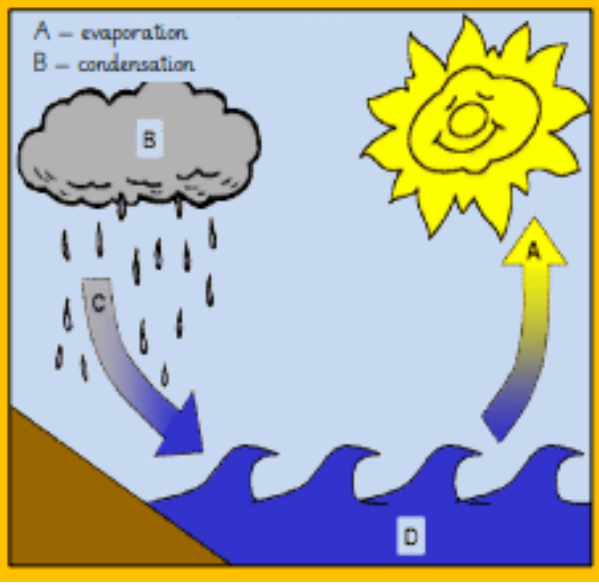
What does **changes of state** mean?
It is when a material changes from one material type to another.

What	Explanation	Name of process	Example
Solid to Liquid	When a solid **melts** it changes to a liquid.	Melting	When an ice cube melts.
Liquid to Gas	A liquid **evaporates** into a gas when it is heated	Evaporation	When water on a fence is warmed up and turns to steam.
Gas to Liquid	When a gas it cooled it **condenses** into a liquid.	Condensation	When steam from the shower cools on the mirror it turns to water.
Liquid to Solid	When a liquid **freezes** it turns into a solid.	Freezing	When the water in a pond freezes, it turns to ice.

Key Vocabulary and Phrases

Temperature	The measure of warmth or coldness of an object.
Celsius	The common scale in the UK for measuring temperature.
Boils	To become so hot (100°C) that water bubbles and then turns into a gas.
Container	Something which holds things inside, like a box, jar or tub.





Temperatures

Boiling	Water boils at exactly 100°C (A hot bath is about 40°C)
Melting	Different solids melt at different temperatures: Ice melts at 0 degrees Celcius (0°C). (Chocolate melts at about 35°C)
Freezing	Water freezes at 0 degrees Celcius (0°C).
Evaporation and Condensation	Water can evaporate and condense at any temperature. But, the warmer it is the faster the evaporation takes place.

Year 4 — Science — Working Scientifically – States of Matter

Key Vocabulary and Phrases	
ask questions	Use the question words **What, where, when why, how**
compare and contrast	Look at two or more objects and describe similarities (what is the same) and differences (what is different)
Diagram/ model	A labelled picture or a 3D representation of the real item
record data	Drawings, scientific diagrams, photos, classification keys, tables, bar graphs and line graph, writing and numbers are ways to show what I have found out.
reporting and presenting findings	Giving reasons, explaining causes and relationships, explaining results and trusting its accuracy

How I could record my findings

Pictures
For EXPLORING

Use this if you want to tell the story of what you did or what you observed. e.g. bread going mouldy

Line Graph
For FAIR TESTING

Use this if you have continuous (numerical) data for both axes e.g. mass on an elastic band & how long it is or are measuring over time

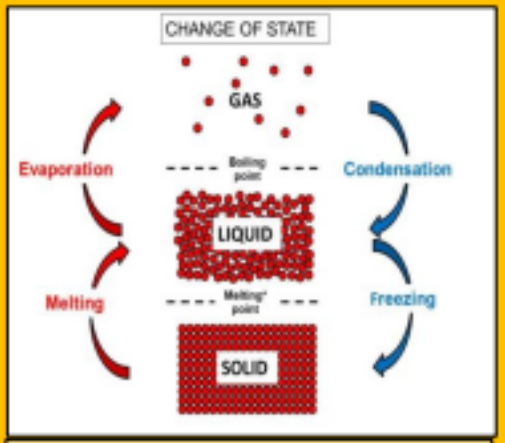
Table
For FAIR TESTING/PATTERN SEEKING

What I Change	What I measure

Use this to record your information. You can transfer it into some of the other forms as well. It could be all numerical or words

What I could investigate

What effect does temperature have on changing state?



Do all liquids evaporate? What liquid will evaporate more quickly?

Equipment I could use

A thermometer to measure temperature

A variety of liquids to evaporate

Fridge to vary temperature

Ice to change state

Stopwatch to record time taken

A camera, pencil and paper to record findings