

Science Knowledge Organiser - Year 4

Unit: What are the states of matter and how do they behave?

Key Vocabulary:

condense	When a gas condenses , it turns into a liquid.
evaporate	When a liquid evaporates , it turns into a gas.
freeze	Liquid turns to a solid when it freezes .
gas	A gas is a state of matter that has no fixed shape and no fixed volume.
liquid	A liquid is a state of matter between solid and gas.
melt	When a solid changes to a liquid, it melts .
precipitation	Liquid or solid particles that fall from a cloud as rain, sleet, hail or snow are known as precipitation .
solid	A solid is a material that keeps its shape, unless a force is applied to it.
states of matter	Materials can be one of the three states of matter : solids, liquids or gases.
viscous	A material that is viscous has a thick, sticky consistency.
water vapour	Water vapour is water that takes the form of a gas, when it is boiled.

Science Skills:

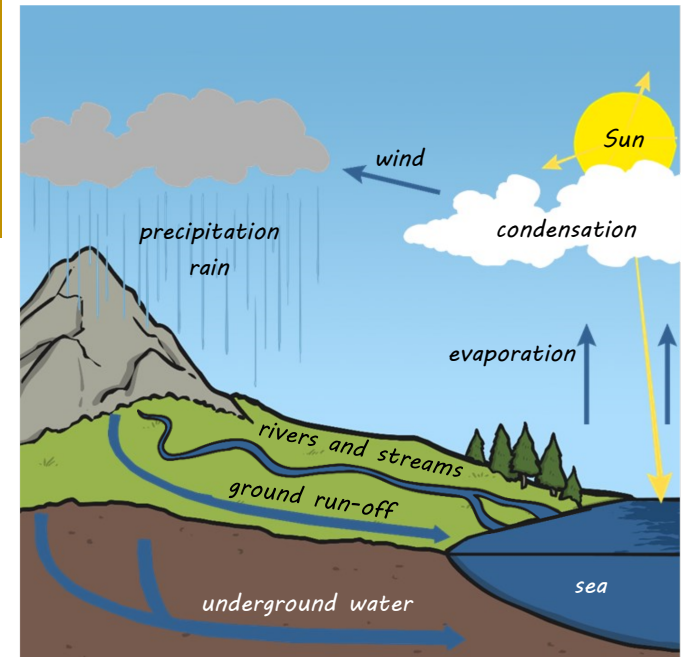
- Compare and group materials together, according to whether they are solids, liquids or gases.
- Observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C).
- Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.
- Make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.
- Set up simple practical enquiries, comparative and fair tests.
- Gather, record, classify and present data in a variety of ways to help in answering questions.
- Use straightforward scientific evidence to answer questions or to support my findings.

1. Water from lakes, puddles, rivers and seas is **evaporated** by the Sun's heat, turning it into **water vapour**.
2. This **water vapour** rises, then cools down to form water droplets in clouds (**condensation**).
3. When the droplets get too heavy, they fall back down to Earth as **precipitation**.

Key Facts:

- **Solids** can be hard, soft or even squashy. They take up the same amount of space no matter what has happened to them.
- **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.
- **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.
- Some materials can change from one **state of matter** to another and back again.

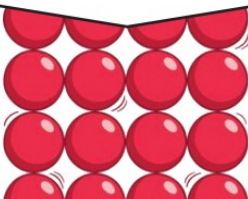
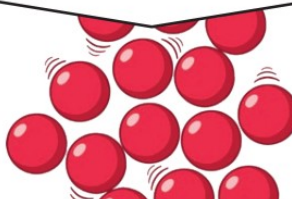
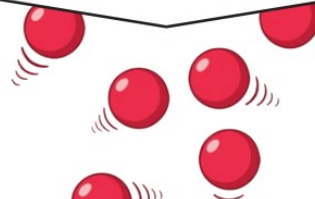
The Water Cycle




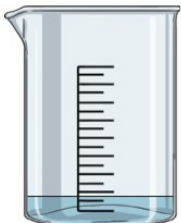


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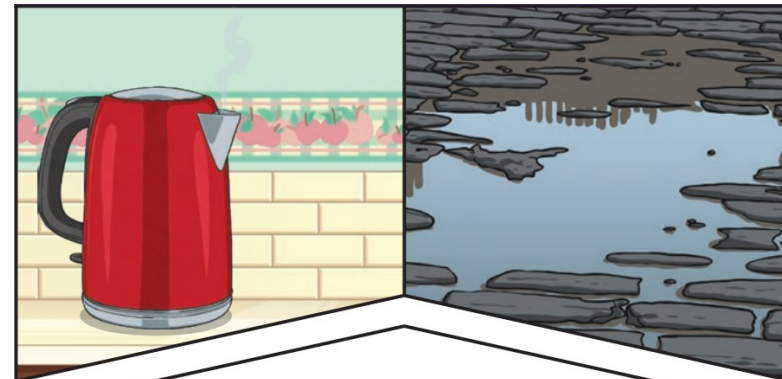
States of Matter

solid	liquid	gas
		
<p>Particles in a solid are close together and cannot move. They can only vibrate.</p>	<p>Particles in a liquid are close together but can move around each other easily.</p>	<p>Particles in a gas are spread out and can move around very quickly in all directions.</p>

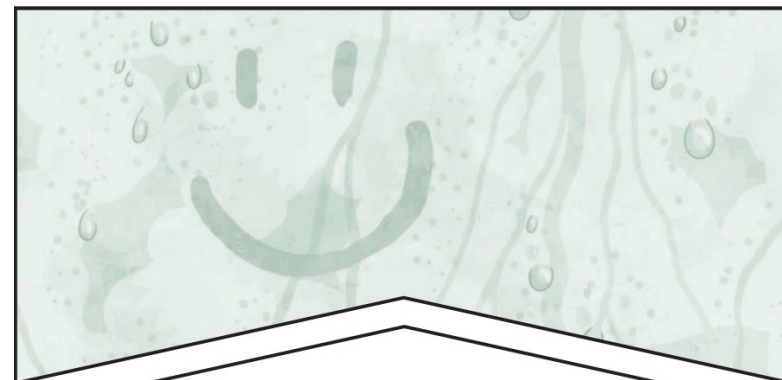
When water and other **liquids** reach a certain temperature, they change state into a **solid** or a **gas**. The temperature that these changes happen at are called the boiling, **melting** or **freezing** point.

<p>solid</p>  <p>heat →</p> <p>liquid</p>  <p>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.</p>	<p>liquid</p>  <p>cold →</p> <p>solid</p>  <p>When freezing occurs, the particles in the liquid begin to slow down as they get colder and colder. They can then only move gently on the spot, giving them a solid structure.</p>
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Condensation and Evaporation



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



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.