Birch Copse Primary School – Knowledge Organiser

Science Topic:	States of Matter	Year 4	Term: Summer

What should I already know and when did I learn this?

- I can distinguish between an object and the material from which it is made. (Y1 - Materials)
- I know a variety of everyday materials, including wood, plastic, glass, metal, water, and rock. (Y1 - Materials)
- I know the simple physical properties of a variety of everyday materials. (Y1 - Materials)
- I have compared and grouped together everyday materials on the basis of physical properties. (Y1 - Materials)
- I know the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. (Y2 - Materials)
- I know the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. (Y2 - Materials)

What will I know by the end of the unit?

- I can compare and group materials together, according to whether they are solids, liquids or gases.
- I can 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).
- I can identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.

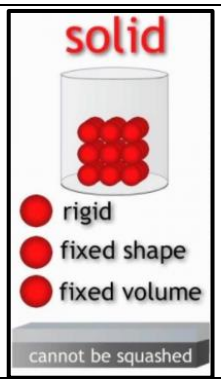
Key Vocabulary

States of matter	Any solid, liquid or gas that exists in the universe.	Particles	An extremely small unit of matter.
Solid	Solid particles are very close together, meaning they hold their shape.	Water Cycle	The process of water being recycled over and over again.
Liquid	Liquids flow and take the shape of the container. Particles are more loosely packed than solids and can move around each other.	Water Vapour	This is water that takes the form of a gas. When water is boiled, it evaporates into a water vapour.
Gas	Gas particles are further apart than solid or liquid particles and they are free to move around.	Evaporation	The process of liquid heating and changing into a gas.
Freezing	Liquid becomes solid when the freezing. Water freezes at 0°C.	Condensation	When gas cools and changes into a liquid.
Melting	When a solid changes to a liquid. Different solids melt at different temperatures. Ice melts at 0°C.	Solidify	To turn a liquid into a solid.
Boiling	Water boils at exactly 100 degrees Celsius (100°C).	Precipitation	Liquid or solid particles that fall from a cloud as rain, sleet, hail or snow.

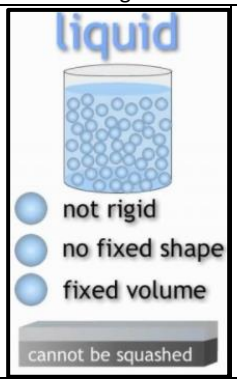
Key Knowledge – States of Matter

There are three states of matter. All materials can be put into one of these three categories.

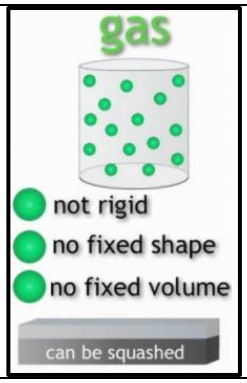
Solids stay in one place and can be held. They do not flow like liquid (some solids like sand or salt can be poured). Solids always take up the same amount of space. They do not spread out like gases.

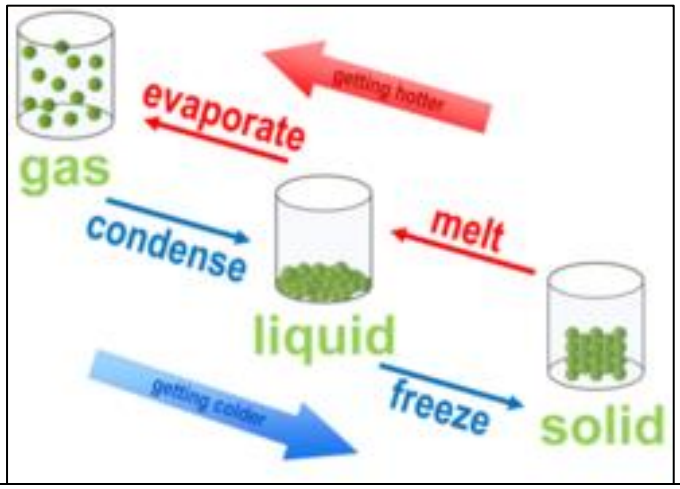


Liquids can flow or be poured easily. They are not easy to hold. Liquids can change their shape depending on the container they are in.



Gases are often invisible. Gases do keep their shape. They spread out and change their shape and volume to fill up whatever container they are in.





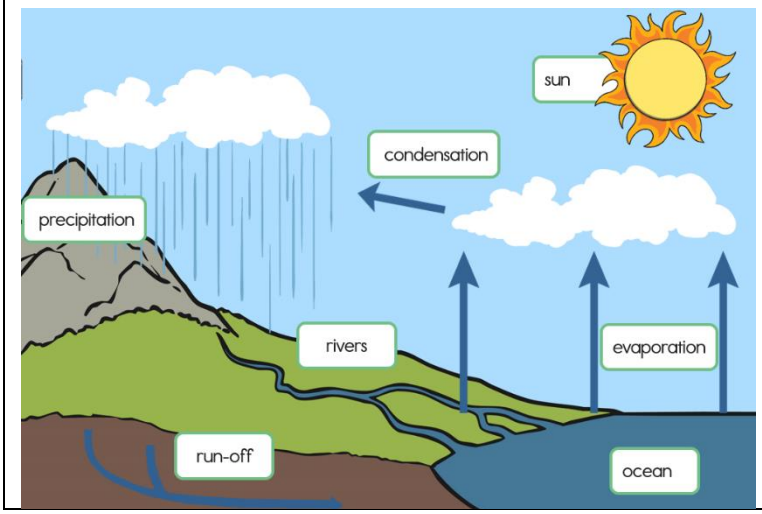
Some materials change state when they are heated or cooled and some of these changes can be reversed.

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. Everyday examples of evaporation: washing drying, water boiling, puddles evaporating on a hot day.

Condensation is when water vapour is cooled down and turns into water. The water vapour in the air cools when it touches the cold surface. Everyday examples of condensation: water droplets forming inside windows or on a cold glass.

Key Knowledge – The Water Cycle

Condensation and evaporation both happen within the water cycle.



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 to the earth as rain, sleet, hail or snow (precipitation).

Investigate

- Name properties of solids, liquids and gases.
- Give everyday examples of melting and freezing.
- Give everyday examples of evaporation and condensation.
- Using data, explain what affects how quickly a solid melts.
- Explain why there is condensation on the inside of a hot water cup but on the outside of the icy water cup.
- From data, explain how to speed up or slow down evaporation.
- Present learning about the water cycle in a range of ways e.g. diagrams, explanation text, story of a water droplet.