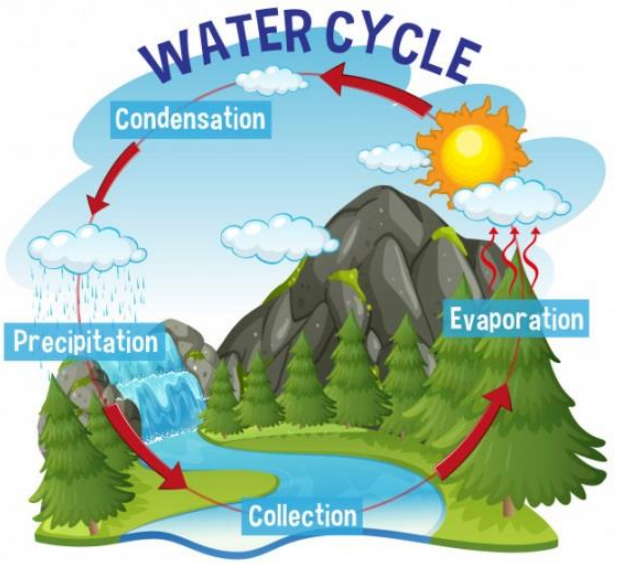
Year Four Knowledge Organiser: States of matter. Where do we observe changes of state?

National Curriculum Specification

Pupils should be taught to:

- 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.



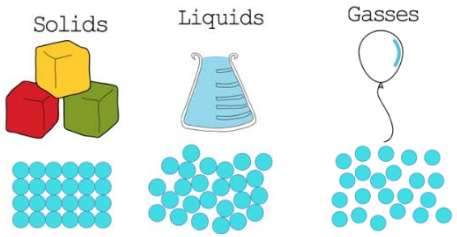
Key Vocabulary	
Particles	Tiny amounts of matter. (what materials are made from). They are too small to be seen with our eyes. Particles are arranged and behave differently in solids, liquids and gasses.
Solid	Having a firm shape or form that can be measured in length, width, and height; not like a liquid or a gas.
Liquid	In a form that flows easily and is neither a solid nor a gas.
Gas	A form of matter that is neither liquid nor solid. A gas rapidly spreads out when it is warmed and contracts when it is cooled.
Condensation	Small drops of water which form when water vapour or steam touches a cold surface, such as a window.
Evaporation	To turn from liquid into gas; pass away in the form of vapour.
Precipitation	Rain, snow, sleet, dew, etc, formed by condensation of water vapour in the atmosphere.
Melting	To change from a solid to a liquid state through heat or pressure.
Freezing	If a liquid or a substance containing a liquid freezes, it becomes solid because of low temperatures.
Water vapour	Water in the gaseous state due to evaporation.

Talking points for home!

Compare the melting points of different foods in your home.

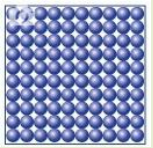
Can you observe any changes in states of matter in your home? (eg: cooking, taking a shower…)

Why do puddles disappear after it rains?



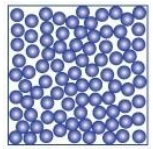
Key Facts

Solids



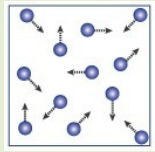
- In the **solid** state, the material holds its shape.
- Solids have vibrating particles which are closely packed in and form a regular pattern.
- This explains the fixed shape of a solid and why it can't poured.
- Solids always take up the same amount of space.

Liquids



- In the **liquid** state, the material holds the shape of the container it is in.
- This means that liquids can change shape, depending on the container.
- Liquids have particles which are close together but random.
- Liquid particles can move over each other.
- Liquids can be poured.

Gasses



- In the **gas** state, particles can escape from open containers.
- Gases have particles which are spread out and move in all directions.

What happens to the particles in water when it is heated or cooled?

- When water (in its liquid form) is heated, the particles start to move faster and faster until they have enough energy to move about more freely. The water has **evaporated** into a water vapour.
- When water is cooled, the particles start to slow down until a solid structure (ice) is formed. The water has **frozen**.
- The temperature at which water turns to ice is called the **freezing point**. This happens at 0o C.