



A solid keeps its shape and has a fixed volume. A liquid has a fixed volume but changes in shape to fit the container. A liquid can be poured and keeps a level, horizontal surface. A gas fills all available space; it has no fixed shape or volume. Granular and powdery solids like sand can be confused with liquids because they can be poured, but when poured they form a heap and they do not keep a level surface when tipped. Each individual grain demonstrates the properties of a solid.

Melting is a state change from solid to liquid. Freezing is a state change from liquid to solid. The freezing point of water is 0oC. Boiling is a change of state from liquid to gas that happens when a liquid is heated to a specific temperature and bubbles of the gas can be seen in the liquid. Water boils when it is heated to 100oC. Evaporation is the same state change as boiling (liquid to gas), but it happens slowly at lower temperatures and only at the surface of the liquid. Evaporation happens more quickly if the temperature is higher, the liquid is spread out or it is windy. Condensation is the change back from a gas to a liquid caused by cooling.

Water at the surface of seas or rivers evaporates into water vapour (a gas). This rises, cools and condenses back into a liquid forming clouds. When too much water has condensed, the water droplets in the cloud get too heavy and fall back down as rain, snow, sleet and drain back into rivers etc. This is known as precipitation. This is the water cycle.

### Knowledge I already have

In Year 1, I learnt to:

- Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock.
- Describe the simple physical properties of a variety of everyday materials.

- Compare and group together a variety of everyday materials on the basis of their simple physical properties.

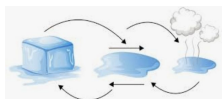
In Year 2, I learnt to:

- Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.
- Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.

### New Knowledge

By the end of this unit, I will:

- 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.

### Future Knowledge

In Year 5, I will:

- Compare and group together everyday materials on the basis of their properties: hardness, solubility, transparency, conductivity (electrical and thermal), response to magnets.
- Know some materials will dissolve in liquid to form a solution; describe how to recover a substance in solution.
- Use knowledge of solids, liquids and gases to decide how mixtures might be separated: filtering, sieving, evaporating.
- Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials
- Demonstrate that dissolving, mixing and changes of state are reversible changes.
- Explain that some changes result in the formation of new materials (usually irreversible)

### Scientific Enquiry

*Identify and Classifying:*

- Materials, explaining why they are solids, liquids and gases.

*Making Observations:*

- Observe a range of materials melting and give melting points.

- Observe water evaporating and condensing.

*Comparative and Fair Testing:*

- Investigate how to melt ice more quickly.
- Explore changing the rate of evaporation e.g. handprints on paper towels, liquid in containers.

*Research using secondary sources:*

- Use secondary sources to find out about the water cycle.

boiling point

Temperature at which a liquid becomes a gas.

condensation



A process where a gas changes to a liquid.

evaporation

A process where a liquid changes to a gas.

freezing point

Temperature at which a liquid becomes a solid.

gas



Fills all available space; has no fixed space or volume.

liquid



Fixed volume; changes shape to fit the container.

melting point

Temperature at which a solid becomes a liquid.

solid



Keeps its shape; fixed volume.