

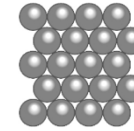
Topic: States of Matter
Year 4

What I should already know

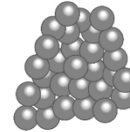
- the names of different types of materials including wood, plastic, glass, metal, water and rock
- name and sort a variety of everyday materials,
- the simple properties of a variety of everyday materials e.g. rough, smooth, transparent
- that materials are chosen for their properties for particular uses
- the shape of solid objects made from some materials can be changed by squashing, bending, twisting and stretching

Exploring the different states of matter

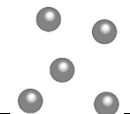
Solids hold their shape until force is applied and cannot be poured and some solids, like sand, act like a liquid because they can be poured but each grain is a solid. Particles in a solid are close together and cannot move, they can only vibrate.



Liquids can be poured and take the shape of the container they are in. Particles in a liquid are close together but can move around each other easily.



Gases can be poured, take the shape of the container and spread out as much as possible. Particles in a gas are spread out and can move quickly in all directions.

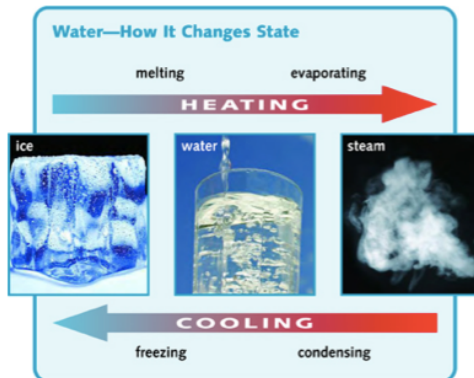


Vocabulary

states of matter	Materials can be one of three states: solids, liquids or gases.
substance	Any solid, liquid, powder or gas is a substance.
solid	A substance that stays the same shape whether it is in a container or not.
liquid	A substance that can flow and take on the shape of a container.
gas	A substance that has no fixed shape, like oxygen.
water vapour	Water that is in the form of a gas.
evaporation	The process of a liquid becoming a gas.
condensation	The process when water vapour in the air changes from a gas back into a liquid.
precipitation	Any rain, snow, sleet or hail that falls to earth.
particle	A very small piece of matter.
Celsius	A scale for measuring temperature, in which water freezes at 0 degrees.
boiling point	The temperature when water begins to boil (on Earth this is 100°C)
thermometer	A scientific instrument for measuring temperature.
viscous	A viscous liquid is thick and sticky.

Changing State

Any pure substance has characteristic temperatures at which it freezes (its **freezing point** which, for most materials, is the same temperature as its **melting point**) or boils (**boiling point**).



Pure water has a **freezing point** of 0°C and a **boiling point** of 100°C at normal atmospheric pressure. A **solid** heated to its melting point or a **liquid** heated to **boiling point** will show no further change in temperature (the heat energy is all used by the change of state). The levelling off of the time and temperature graph shows where the melting or **boiling point** is.

Evaporation, Condensation and the water cycle

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

Condensation is when water vapour has cooled down and turns into water droplets.

The Water Cycle

- Energy from the sun heats up the water in our rivers, lakes and oceans.
- Water **evaporates** into the air, turning into a **gas** called **vapour**.
- The **water vapour** rises up into the sky where it cools.
- The **water vapour** turns back into a **liquid**, forming clouds. This process is called **condensation**.
- Eventually the water droplets in the clouds become too heavy for the air to hold them.
- They fall back down to Earth as rain (or as snow or hail if cooled below freezing point), a process known as **precipitation**.
- The fallen **precipitation** is then collected in rivers that flow to the sea. This is called runoff.
- The water cycle then begins again as the sun heats the water.

