

Changing states

Try the quiz:

http://www.bbc.co.uk/bitesize/ks2/science/materials/changing_states/read/1/

Introduction

Solids, liquids and gases are called the three states of matter. Materials can be changed from one state to another by heating or cooling.

Water can be observed as a liquid, a solid (ice), or a gas (water vapour) and moves around the environment in a process known as the water cycle.

States of matter

Solids, liquids and gases are called the three states of matter.

Materials can be changed from one state to another by heating or cooling.

Heating

- If ice (solid) is heated, it changes to water (liquid). This change is called **melting**.
- Water (liquid) can change to water vapour (gas). This is called **evaporation**.
- If water (liquid) is heated until it **boils**, it changes to water vapour (gas) very quickly. Water boils at 100°C

Cooling

- If water vapour (gas) is cooled, it changes to water (liquid). This change is called **condensing**.
- If water (liquid) is cooled, it changes to ice (solid). This change is called **freezing**. Water freezes at 0°C

Solids and liquids

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Heat melts a solid and turns it into a liquid. Cooling freezes a liquid into a solid.

Different solids melt at different temperatures, some high, some low. These are called their melting points.

Heating

Heat can change solids into liquids or gases.

- Most solids **melt** into liquid when they are heated.
- A liquid **evaporates** into a gas when it is heated.

Cooling

When we cool something we take heat away from it. Cooling changes a gas into a liquid, and a liquid into a solid.

- A gas **condenses** into a liquid when it is cooled.
- A liquid **freezes** into a solid when it is cooled.



Melting points

Different solids melt at different temperatures. Ice melts at 0 degrees Celcius (0°C). Chocolate melts at about 35°C. We say that chocolate has a higher **melting point** than ice.

Metals, like aluminium and iron, also melt when we heat them. They have very high melting points. They have to be very hot to melt.

Temperature

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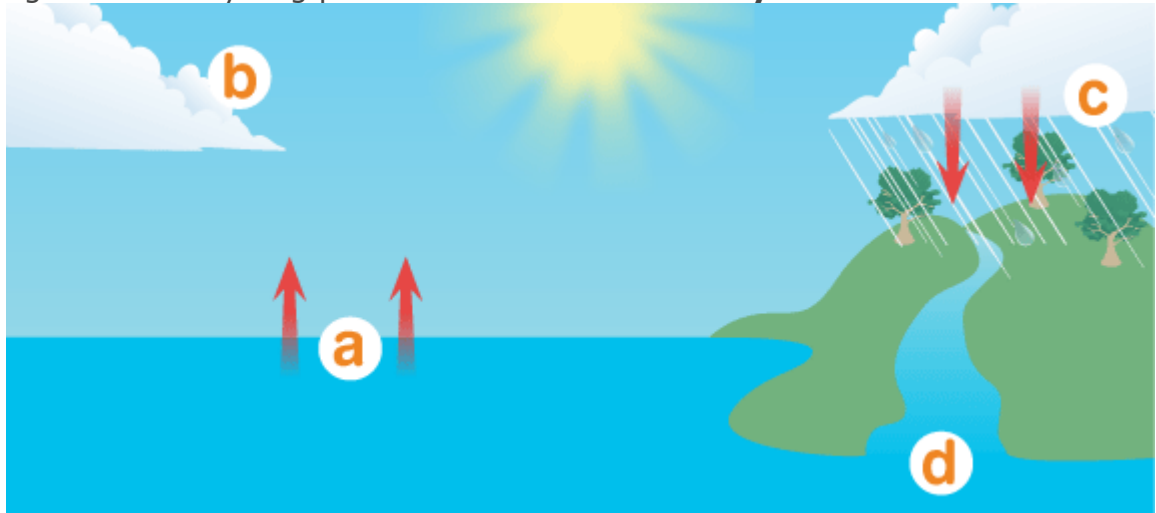
Temperature is a measure of how hot or cold things are. You need a **thermometer** to measure temperature.

Temperature is measured in **degrees Celsius** (°C).

- Ice melts at exactly 0°C.
- A hot bath is about 40°C
- Water boils at exactly 100°C

- **The water cycle**

- Water on the earth is constantly moving. It is recycled over and over again. This recycling process is called the **water cycle**.



- **a. Water evaporates into the air**
The sun heats up water on land, and in rivers, lakes and seas and turns it into water vapour. The water vapour rises into the air.
- **b. Water vapour condenses into clouds**
Water vapour in the air cools down and changes back into tiny drops of liquid water, forming clouds.
- **c. Water falls as rain**
The clouds get heavy and water falls back to the earth in the form of rain or snow.
- **d. Water returns to the sea**
Rain water runs over the land and collects in lakes or rivers, which take it back to the sea. The cycle starts all over again.