



Driving Question: See History Spring 1

Power Skill: See History Spring 1

National Curriculum Learning Objectives

- 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

solid

liquid

gas

evaporate

condense

water cycle

Key Learning

States of matter:

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

Properties of Solids:

- Solids stay in one place and can be held.
- Solids keep their shape -they do not flow like liquids.
- Solids always take up the same amount of space. They do not spread out like gases.
- Solids can be cut or shaped.
- Even though they can be poured, sugar, salt and flour are all solids. Each particle of salt, for example, keeps the same shape and volume.
- Examples of solids include ice, wood and plastic.



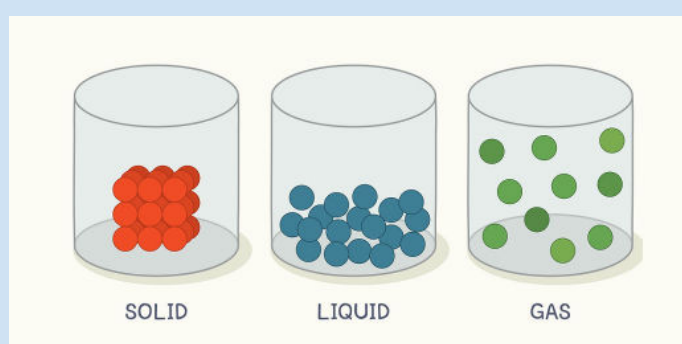
Properties of Liquids:

- Liquids can flow or be poured easily. They are not easy to hold.
- Liquids change their shape depending on the container they are in.
- Even when liquids change their shape, they always take up the same amount of space. Their volume stays the same.
- Examples of liquids include water, honey and milk.



Properties of Gases:

- Gases are often invisible.
- Gases do not have a fixed shape. They spread out and change their shape and volume to fill up whatever container they are in.
- Gases can be squashed.
- Examples of gases include steam, oxygen and helium.



Thinking Point

Is sand a solid or a liquid? How do you know?



Explore and Investigate

Investigating melting points: Heat different solids and measure the temperature of them when they begin to melt.

Water Cycle bag: Observe the water cycle by seeing evaporation and condensation happening within a plastic bag on a windowsill.

Resources:

Thermometers, tea lights, foil trays

Key Learning

Changing state:

Solids, liquids and gases can be changed from one state to another by heating or cooling. Heat melts a solid and turns it into a liquid. Cooling freezes a liquid into a solid.

Heating:

If ice (solid) is heated, it changes to water (liquid). This change is called melting. Different solids melt at different temperatures. Ice melts at 0 degrees Celsius (0°C). Chocolate melts at about 35°C . Therefore, we say that chocolate has a higher melting point than ice.



Cooling:

If water (liquid) is cooled to its freezing point (0°C), it changes to ice (solid). This change is called freezing. Different liquids freeze at different temperatures. Water freezes at 0°C .



Thinking Point

Can you think of something else which has a higher melting point than ice?



Liquids and gases can also be changed from one state to another by heating or cooling.

Evaporation:

If water (liquid) is heated, it changes to water vapour or steam, which is a gas. This change is called evaporation. This can happen at any temperature above freezing point (0°C), but is most obvious when water reaches its boiling point (100°C). When the temperature is higher, evaporation happens at a faster rate and is more obvious to observe.



Condensation:

If water vapour or steam (gas) is cooled down, it changes into water, which is a liquid. This change is called condensation. You can often see condensation happening on a cold morning. When the moisture (water vapour) in the air touches the cold glass on the windows, it condenses back in to liquid water.



Thinking Point

Can you think of other examples where you have seen evaporation or condensation?



Evaporation and condensation in the water cycle:

Earth has been recycling water for over 4 billion years!

The world's water moves between lakes, rivers, oceans, the atmosphere and the land in an ongoing cycle called the water cycle. As it goes through this continuous system, it can be a liquid (water), a gas (vapour) or a solid (ice). There are 3 main stages of the water cycle which continuously repeats:

Evaporation:

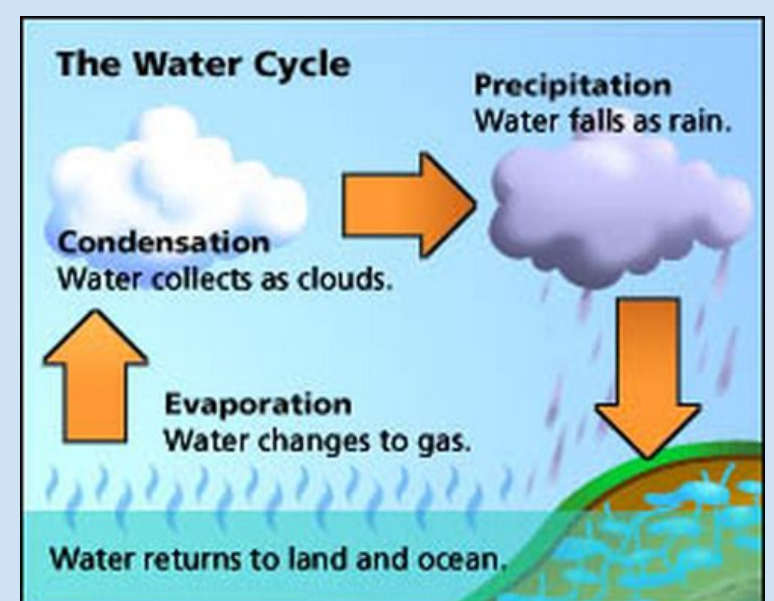
Energy from the Sun heats up the surface of the Earth, causing the temperature of the water in our rivers, lakes and oceans to rise. When this happens, some of the water evaporates into the air/atmosphere, turning into a gas called vapour.

Condensation:

As water vapour rises up high into the sky, it cools and turns back into a liquid, forming clouds. This process is called condensation. Air currents high up in the air move these clouds around the globe.

Precipitation:

When too much water has condensed, the water droplets in the clouds become too big and heavy for the air to hold them. Depending on the temperature and how quickly the vapour condenses or sometimes freezes, the vapour can turn to rain, sleet, hail or snow, a process known as precipitation.



Thinking Point

Do we ever drink 'new' water?

