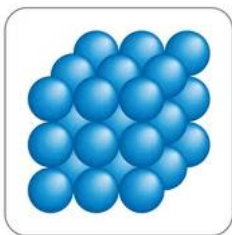




Important Information

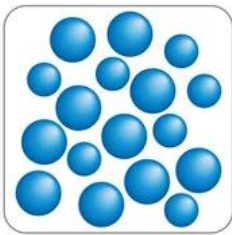
STATES OF MATTER

SOLIDS



- ✓ Particles in a solid are close together and cannot move.
- ✓ Solids stay in one place and they keep their shape.
- ✓ A solid can be held in your hand.
- ✓ Solids always take up the same amount of space and can be cut or shaped.
- X Solids do not flow like liquids and do not spread out like gases.

LIQUIDS



- ✓ Particles in a liquid are close together but can move around each other easily.
- ✓ Liquids flow and can be poured easily.
- ✓ Liquids change their shape depending on the container they are in.
- ✓ Even when liquids change shape, their volume remains the same.
- X Liquids are not easy to hold.

GASES



- ✓ Particles in a GAS are spread out and can move around very quickly in all directions.
- ✓ Gases are usually invisible.
- ✓ Gases can be squashed.
- ✓ Gases change their shape and volume to fill up whatever container they are in.
- X Gases do not keep their shape or always take up the same amount of space.

VOCABULARY

change – to make different, to alter in some way

collection - when water flows back into the sea.

condensation – when water vapour cools and turns into water (gas to liquid)

evaporation – when water is heated and turns into water vapour (liquid to gas)

freeze – when a liquid turns to a solid during the freezing process

gas – a state of matter which has no defined shape or volume

heat – when something is put at a hot temperature

liquid – a state of matter which flows freely but keeps the same volume

precipitation – liquid or solid particles which fall from a cloud as rain, sleet, hail or snow

solid – a state of matter which keeps its shape unless a force is applied

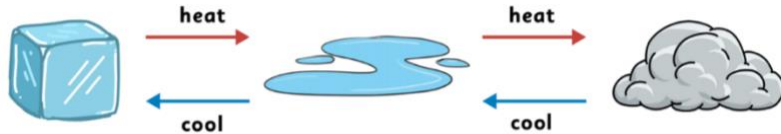
states of matter – all materials fall into one of 3 states. They are either a solid, liquid or a gas. Some materials can change from one state to another back again.

temperature – how hot or cold something is

water vapour – what is produced when water is boiled, turning water from a liquid to a gas

CHANGING STATE

When liquids reach a certain temperature, they change state into a solid or a gas. These temperatures are called the **boiling**, **melting** or **freezing** point.



If a solid is heated to its **melting point**, it melts and changes to a **liquid**. This is because the particles start to move faster and faster until they are able to move over and around each other.

When **freezing** occurs, the particles in the liquid begin to slow down as they get colder. They can then only vibrate gently on the spot, giving them a **solid** structure.

EVAPORATION

Evaporation occurs when water turns into water vapour. This happens very quickly when the water is hot, such as when in a kettle, but it can also happen slowly, like when a puddle evaporates on a warm summer's day.

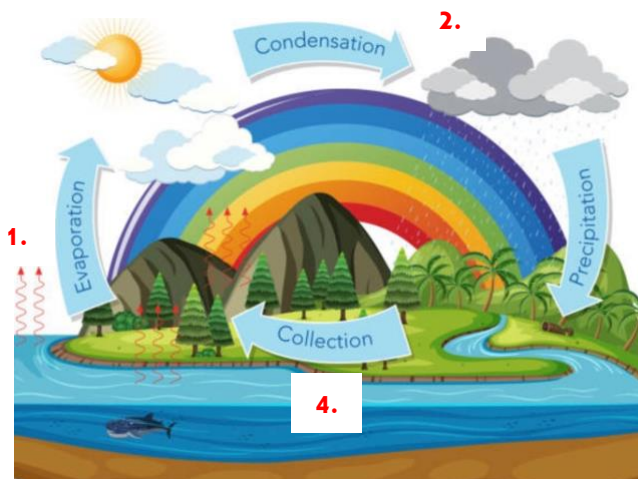


CONDENSATION



Condensation is when water vapour is cooled down and turns into water. You can see this when droplets of water form on a window. The **water vapour** in the air cools when it touches the cold surface.

THE WATER CYCLE



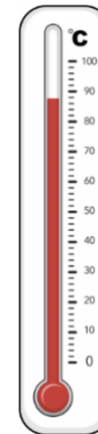
Condensation and **evaporation** occur within the **water cycle**.

The water cycle process:

1. Water from seas, rivers, lakes and puddles is **evaporated** by the sun's heat, turning it into **water vapour**.
2. This **water vapour** rises, then cools down to form water droplets in clouds (**condensation**).
3. When the **droplets** get too heavy, they fall back to the earth as rain, sleet, hail or snow (**precipitation**).
4. When water flows back into rivers, streams, and lakes and gets carried back to sea is the **collection**.

TEMPERATURE

Temperature is how hot or cold something is. We measure the temperature of a liquid by putting a thermometer into it and waiting for the coloured centre to stop moving. We then read the temperature off the thermometer in Celsius - $^{\circ}\text{C}$ - at the point where the coloured centre stops.



Progression of skills in Science: Working Scientifically

Year 4

Throughout the year, pupils will:

- ask relevant questions and use different types of scientific enquiries to answer them
- set up simple practical enquiries, comparative and fair tests
- make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment, including thermometers and data loggers
- record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables
- gather, record, classify and present data in a variety of ways to help in answering questions
- identify differences, similarities or changes related to simple scientific ideas and processes
- report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions
- use straightforward scientific evidence to answer questions or to support their findings
- use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions

Year 5

Throughout the year, pupils will:

- plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary
- take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate
- record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs
- identify scientific evidence that has been used to support or refute ideas or arguments
- report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations
- use test results to make predictions to set up further comparative and fair tests

States of Matter

Within this unit, children will be able 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 Question: After it rains, will puddles disappear? Explain your answer, using scientific reasoning.