Knowledge Organiser: Year 4 - States of Matter

Careers connected to States of Matter: Chemical Engineer, Pharmacologist, Pharmaceutical pharmacist, Chemist.

Lesson Sequence

1. Compare and group the 3 states of matter

2. Explore how particles behave in solids, liquids and gases

3. Investigate melting points

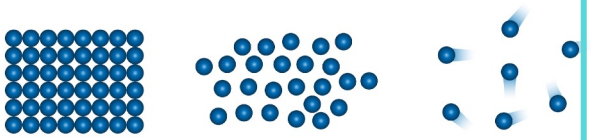
4. Explore freezing and boiling points

5. Explore evaporation and condensation

6. Understand the water cycle

States of matter

Everything in our universe is made of **matter**. There are 3 states of matter:

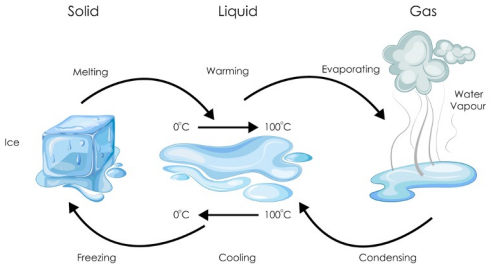


Solid **Liquid** **Gas**

Solid particles have **strong** bonds so solids have a fixed shape. **Liquid** particles have **weaker** bonds and more energy so liquids can change shape. **Gas** particles have **really weak** bonds so gases can spread out and move freely.

Changes of state

States of matter can change.
Substances can be **heated** or **cooled** to change from one state to another.



Ice **Water** **Water Vapour**

In water, the **melting** and **freezing point** is **0˚C** and the **boiling point** is **100 ˚C.**
Different substances have different melting, freezing and boiling points.

Condensation

When **water vapour (gas)** touches a **cold** surface, the particles **lose energy** and the bonds become **stronger**, turning the gas into a **liquid**.

Evaporation

Heating liquid water **increases** the particle's energy and the bonds become **weaker**, turning it into a **gas**. The **hotter** the temperature, the **faster** the rate of evaporation.

Knowledge Organiser: Year 4 - States of Matter

Before & After Test

Tick the correct statements.

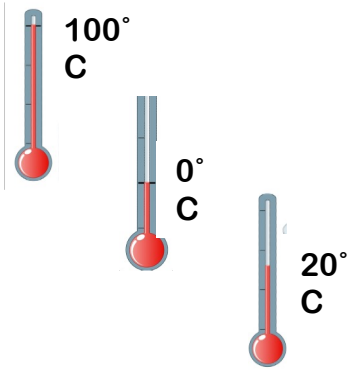
Gas particles have lots of energy.		There are strong particle bonds in liquids.	
Solids are a fixed shape.		Solid particles do not have much energy.	
Liquids cannot change shape.		Ice is a liquid.	
Gases cannot be squashed.		Helium is a solid.	

Draw lines to match the labels to the thermometers:

Room temperature

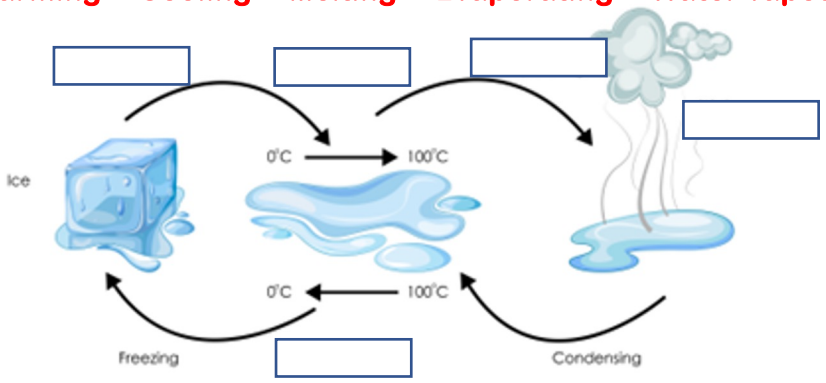
Boiling point of water

Freezing point of water



Add the following labels to the diagram:

Warming **Cooling** **Melting** **Evaporating** **Water vapour**



You have been asked to design an experiment to see whether temperature affects the rate of evaporation.
What is the **variable** you will **change**?

_____

What is condensation?

_____

_____

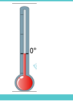
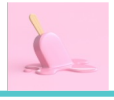
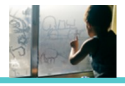
_____

_____

Unit Rocket Words: Year 4 - States of Matter

Careers connected to the human body: doctor, nurse, massage therapist, personal trainer, theatre technician

Rocket Words

	thermometer	an instrument that measures temperature in degrees Celsius (˚C) or Fahrenheit (˚F)
	melting point	the point where a solid melts and forms a liquid when heated
	freezing point	the point where a liquid freezes and forms a solid when cooled
	boiling point	the point where a liquid evaporates and forms a gas when heated
	solid	state of matter that holds its form and shape
	liquid	state of matter which flows and forms a pool
	gas	state of matter which flows, can spread out and can be squashed
	evaporation	the process where a liquid turns into a gas when heated
	particles	one very small part of matter
	condensation	the process where a gas forms a liquid when cooled
	water vapour	the name of water as a gas
	substance	the material, or matter, of which something is made