YEAR 4 KNOWLEDGE ORGANISER

The Secret Science of Mixtures

Hook: Harry Potter World | **Class read:** Harry Potter – J. K. Rowling

How can heating and cooling change materials?

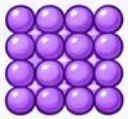
LEARNING THIS TERM

History:	Science:	PSHE / No Outsiders:	French:	Art:	RE:	Games:	PE:	Computing:	Music:
History of medicine	States of matter	Keeping safe	Classroom objects	Drawing – Power Prints	What did Jesus say about God's kingdom, and why is it good news?	Team and invasion games – attacking and defending	Copy and repeat movement skills	Programming A – repetition in shapes (LOGO); online safety	Percussion; Vivaldi – Winter

SOLID, LIQUID OR GAS?

SOLID

Keeps its own shape and volume. Particles are close together and vibrate in fixed positions.



Examples: ice, wood, metal.



LIQUID

Flows and takes the shape of its container. Keeps the same volume. Particles are close together and move past each other.



Example: water.



GAS

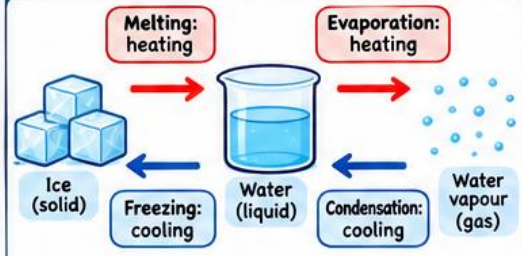
Spreads out to fill its container. Particles are far apart and move quickly in all directions.



Example: air.



CHANGING STATE





Pure water freezes at 0°C.



Pure water boils at 100°C at normal air pressure.

Evaporation can happen below boiling point. Water vapour is an invisible gas.

MIXTURE DETECTIVES

A mixture contains two or more substances.



Muesli: solids mixed together.



Oil and water: liquids that do not mix.



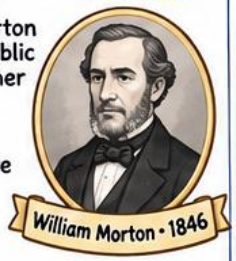
Salt and water: salt dissolves to form a solution.

Mixing and melting are different processes.

HISTORY OF MEDICINE

- Long ago, people used herbal mixtures to try to treat illnesses.
- Anaesthetics: prevent pain during medical procedures. Some cause a temporary loss of consciousness.
- In 1846, William Morton gave a successful public demonstration of ether anaesthesia during surgery.
- Modern medicines are carefully tested.





KEY VOCABULARY

Matter	anything that has mass and takes up space.
Particle	a tiny piece used in a model of matter.
Melting	a solid changing into a liquid.
Freezing	a liquid changing into a solid.
Evaporation	a liquid changing into a gas at its surface.
Condensation	a gas changing into a liquid.
Temperature	how hot or cold something is, measured in °C.
Anaesthetic	a medicine that prevents pain during a procedure.
Potion	a mixture believed in stories to have magical powers.

WE WILL BE ABLE TO...

- ✓ Group materials as solids, liquids or gases.
- ✓ Observe and describe changes caused by heating or cooling.
- ✓ Measure temperature in degrees Celsius.
- ✓ Explain melting, freezing, evaporation and condensation.

LEARNING LINKS

Before: Year 2 – The Marvellous Materials Lab: properties, mixing, melting and freezing.

Next: Year 5 – The Island of Scientific Secrets: dissolving, solutions, separating mixtures and reversible changes.



Think like a scientist: follow instructions, protect your eyes and never taste experiment mixtures.