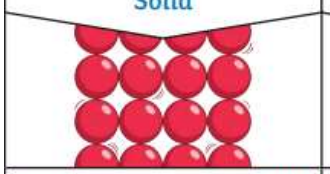
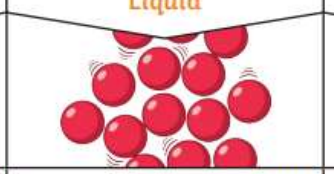
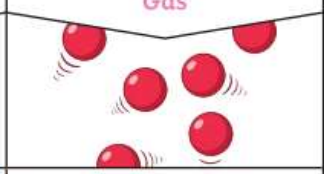
Science – States of Matter

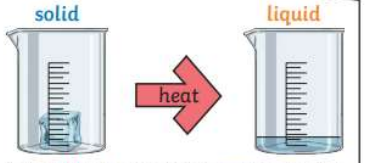
States of matter

There are three states of matter.

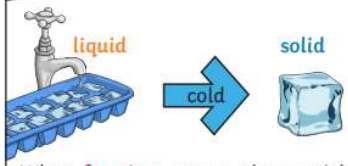
Solid	Liquid	Gas
		
Particles in a **solid** are close together and cannot move. They can only vibrate.	Particles in a **liquid** are close together but can move around each other easily.	Particles in a **gas** are spread out and can move around very quickly in all directions.

Changing state

When water and other **liquids** reach a certain temperature, they change state into a **solid** or a **gas**. The temperatures that these changes happen at are called the boiling, **melting** or **freezing** point.



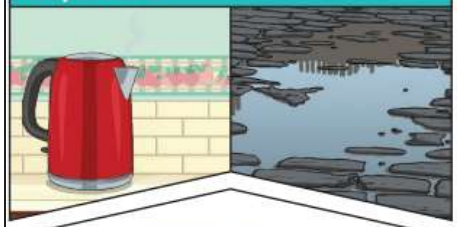
If a **solid** is heated to its **melting** point, it **melts** and changes to a **liquid**. This is because the particles start to move faster and faster until they are able to move over and around each other.



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

Evaporation and Condensation

Evaporation



Evaporation occurs when water turns into **water vapour**. This happens very quickly when the water is hot, like in a kettle, but it can also happen slowly, like a puddle **evaporating** in the warm air.

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.

Key Vocabulary

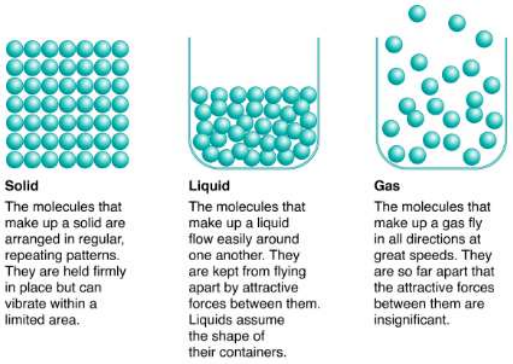
Solid	Materials that keep their shape unless a force is applies to them. They take up the same amount of space no matter what has happened to them.
Liquid	Take the shape of their container. They can change shape but not the amount of space they take up. They can flow or be poured.
Gas	Gases can spread out to fill the container they are in. They do not have a fixed shape.
Evaporation	When a liquid is heated and becomes a gas.
Condensation	When a gas is cooled and becomes a liquid.
Particles	A tiny piece of matter. Everything in the universe is made of particles.
Water Cycle	The movement of water around the Earth.
Freezing	When a liquid is cooled and it becomes a solid.
Heating	Applying heat. A solid becomes a liquid and a liquid becomes a gas.
Temperature	The measure of the warmth or coldness of an object or material.
Celcius	A measure of temperature.

States of Matter – Skills – Working Scientifically

National Curriculum

Identifying differences, similarities or changes related to simple scientific ideas and processes.
Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.
Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables.
Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.
Setting up simple practical enquiries, comparative and fair tests.

Diagram



Table

Table 1

Week	Total grass height (inches)		
	Trial A	Trial B	Trial C
0	0.50	0.50	0.50
1	1.26	1.01	0.94
2	2.21	1.48	1.13
3	3.52	2.03	1.20

Key Vocabulary

classify	To arrange a group of people/organisms or things into classes or categories.
compare	Note similarities and differences between different things e.g. compare different types of materials
diagram	A drawn and annotated representation of how an experiment has been set up.
measuring (temperature)	Use a thermometer to record the exact temperature of a material.
observation	Spotting patterns and changes over time.
data	Information that has been collected.
fair test	A test that controls all but one variable when attempting to answer a scientific question.