




What should I already know?

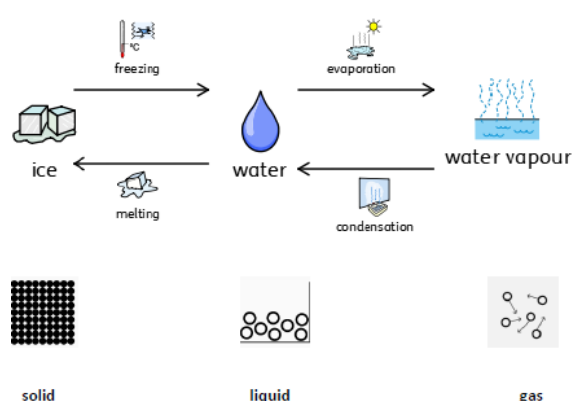
- Why some materials are used for certain purposes because of their **properties**
- The **water cycle**, and the **processes** of **evaporation**, **condensation** and **precipitation**.

What will I know at the end of the unit?

- What is a particle?**
- **Particles** are what materials are made from.
  - They are so small that we cannot see them with our eyes.
  - The **properties** of a substance depend on what its particles are like, how they move and how they are arranged
  - Particles behave differently in solids, liquids and **gases**.
- What is a solid?**
- 
- In the **solid** state, the material holds its shape.
  - **Solids** have **vibrating particles** which are closely packed in and form a regular pattern.
  - This explains the fixed shape of a solid and why it can't be poured.
  - **Solids** always take up the same amount space.
- What is a liquid?**
- 
- In the **liquid** state, the material holds the shape of the container it is in.
  - This means that **liquids** can change shape, depending on the container.
  - **Liquids** have **particles** which are close together but random.
  - **Liquid particles** can move over each other.
  - **Liquids** can be poured.
- What is a gas?**
- 
- In the **gas** state, **particles** can escape from open containers.
  - **Gases** have **particles** which are spread out and move in all directions.
- What happens to the particles in water when it is heated or cooled?**
- When water (in its **liquid** form) is **heated**, the particles start to move faster and faster until they have enough energy to move about more freely. The water has **evaporated** into a **water vapour**.
  - When water is **cooled**, the particles start to slow down until a solid structure (ice) is formed. The water has **frozen**.
  - The **temperature** at which water turns to ice is called the **freezing point**. This happens at 0°C.

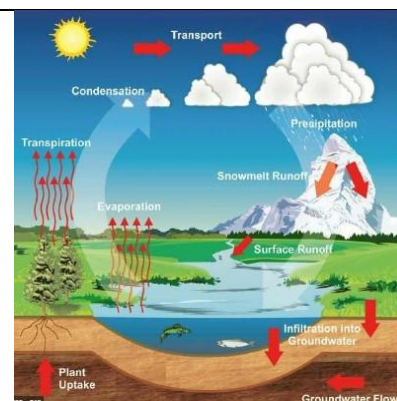
condensation	small drops of water which form when <b>water vapour</b> or steam touches a cold <b>surface</b> , such as a window
cooling	lowering the <b>temperature</b> of something
evaporation	to turn from liquid into gas; pass away in the form of <b>vapour</b> .
freezing	If a <b>liquid</b> or a substance containing a <b>liquid freezes</b> , it becomes <b>solid</b> because of low <b>temperatures</b>
freezing point	The <b>freezing point</b> of a particular substance is the <b>temperature</b> at which it <b>freezes</b> . The <b>freezing point</b> of water is 0°C.
gas	a form of matter that is neither <b>liquid</b> nor <b>solid</b> . A <b>gas</b> rapidly spreads out when it is warmed and contracts when it is <b>cooled</b> .
heating	raising the <b>temperature</b> of something
liquid	in a form that flows easily and is neither a <b>solid</b> nor a <b>gas</b> .
melting	to change from a <b>solid</b> to a <b>liquid</b> state through heat or pressure
melting point	The <b>melting point</b> of a particular substance is the <b>temperature</b> at which it <b>melts</b> .
particles	a tiny amount or small piece
precipitation	rain, snow, sleet, dew, etc, formed by <b>condensation</b> of <b>water vapour</b> in the atmosphere
process	a series of actions used to produce something or reach a goal.
properties	the ways in which an object behaves
solid	having a firm shape or form that can be measured in length, width, and height; not like a <b>liquid</b> or <b>gas</b>
temperature	a measure of how hot or cold something is
vibrations	when something <b>vibrates</b> , it shakes with repeated small, quick movements
water cycle	the <b>process</b> by which water on the earth <b>evaporates</b> , then <b>condenses</b> in the atmosphere, and then returns to earth in the form of <b>precipitation</b> .
Water vapour	Water in the gaseous state, esp when due to evaporation at a temperature below the boiling point.

Diagram



What is the water cycle?

(see separate knowledge organiser Geography - The Water Cycle)



Investigate





- Group materials according to their states.
- Explain the **particle** structure of **solids, liquids and gases**.
- Explore the effect of **temperature** on substances such as chocolate, butter, cream. Compare their **melting points** and place them in a table.
- Research the **temperature** at which materials change state, for example, when iron **melts** or when oxygen **condenses** into a **liquid**.
- Observe and record **evaporation** over a period of time, for example, a puddle in the playground or washing on a line, and investigate the effect of **temperature** on washing drying or snowmen melting.
- Analyse and interpret different forms of data (tables, graphs) to show the effects of **temperature** on states of matter.
- Present what you know about the water cycle using a variety of skills using appropriate vocabulary (The Water Cycle Knowledge Organiser).
- Observe **evaporation** and **condensation** in action by using bowls of water and mirrors /glass (The Water Cycle Knowledge Organiser).

Green Lane Primary

Topic-States of matter

Year 4

Strand - Chemistry

Question 1: The particles in a solid:	Start of unit:	End of unit:	Question 6: Name the process that describes the change from water to ice.	Start of unit:	End of unit:
are closely packed together and vibrate					
move freely over each other within a container in which they are held					
can be poured					
are very spread out and can escape an open container					
Question 2: The particles in a liquid (tick two):	Start of unit:	End of unit:	Question 7: Write solid, liquid or gas to label each part of the diagram.	Start of unit:	End of unit:
are closely packed together and vibrate					
move freely over each other within a container in which they are held					
can be poured					
are very spread out and can escape an open container					
Question 3: The particles in a gas:	Start of unit:	End of unit:	Question 8: Match these changes to the scientific name for the process.	Start of unit:	End of unit:
are closely packed together and vibrate			<div style="display: flex; flex-wrap: wrap; justify-content: space-around;"> <div style="border: 1px solid black; padding: 2px; margin: 5px;">ice turns to water</div> <div style="border: 1px solid black; padding: 2px; margin: 5px;">condensation</div> <div style="border: 1px solid black; padding: 2px; margin: 5px;">water turns to water vapour</div> <div style="border: 1px solid black; padding: 2px; margin: 5px;">evaporation</div> <div style="border: 1px solid black; padding: 2px; margin: 5px;">water vapour turns to water</div> <div style="border: 1px solid black; padding: 2px; margin: 5px;">melting</div> </div>		
move freely over each other within a container in which they are held					
can be poured					
are very spread out and can escape an open container					
Question 4: Match the states to their particle structure:	Start of unit:	End of unit:	Question 9: Solids, liquids and gases have different properties. Indicate using an S, L or G, which state these properties apply to.	Start of unit:	End of unit:
<div style="display: flex; justify-content: space-around;"> <div style="border: 1px solid black; padding: 5px; text-align: center;">solid</div>  </div>			keeps its own shape can be poured : flows easily through a pipe takes the shape of the container it is in Can escape from an open container		
<div style="display: flex; justify-content: space-around;"> <div style="border: 1px solid black; padding: 5px; text-align: center;">liquid</div>  </div>					
<div style="display: flex; justify-content: space-around;"> <div style="border: 1px solid black; padding: 5px; text-align: center;">gas</div>  </div>					
Question 5: What is the freezing point of water?	Start of unit:	End of unit:	Question 10: Explain why puddles get smaller after it has rained	Start of unit:	End of unit: