Sholing Junior School - Science

Topic: States of Matter | Year: 4 | Strand: Chemistry

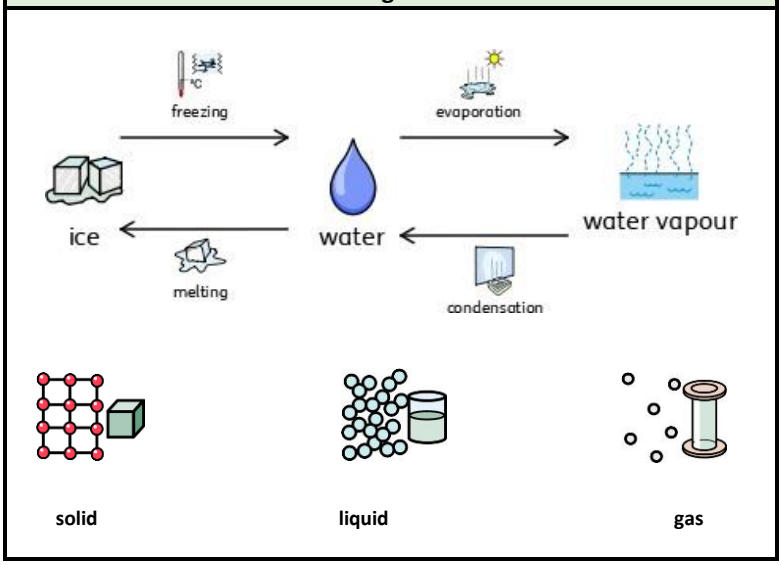
What should I already know?

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

Vocabulary

condensation	Small drops of water which form when **water vapour** or steam touches a cold **surface**, such as a window
cooling	Lowering the **temperature** of something
evaporation	To turn from liquid into gas; pass away in the form of **vapour**.
freezing	If a **liquid** or a substance containing a **liquid freezes**, it becomes **solid** because of low **temperatures**
freezing point	The **freezing point** of a particular substance is the **temperature** at which it **freezes**. The **freezing point** of water is 0°C.
gas	A form of matter that is neither **liquid** nor **solid**. A **gas** rapidly spreads out when it is warmed and contracts when it is **cooled**.
heating	Raising the **temperature** of something
liquid	In a form that flows easily and is neither a **solid** nor a **gas**.
melting	To change from a **solid** to a **liquid** state through heat or pressure
melting point	The **melting point** of a particular substance is the **temperature** at which it **melts**.
particles	A tiny amount or small piece
precipitation	Rain, snow, sleet, dew, etc, formed by **condensation** of **water vapour** 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 **liquid** or a **gas**
temperature	A measure of how hot or cold something is
vibrations	When something **vibrates,** it shakes with repeated small, quick movements
water cycle	The **process** by which water on the earth **evaporates**, then **condenses** in the atmosphere, and then returns to earth in the form of **precipitation**.
water vapour	Water in the **gaseous** state, esp when due to **evaporation** at a **temperature** below the boiling point

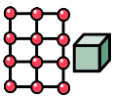
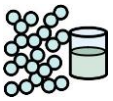
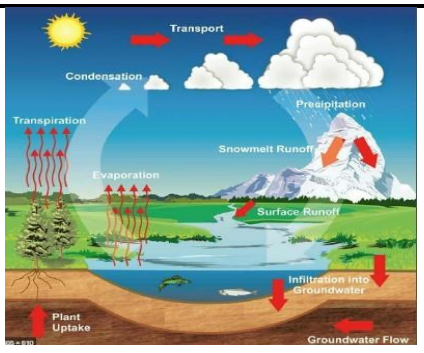
Diagram



What will I know by the end of the unit?

I will:

- **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.**

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 of 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.
What is the **water cycle?**	

Investigate!

We will explore a variety of everyday materials and develop simple descriptions of the states of matter (solids hold their shape; liquids form a pool not a pile; gases escape from an unsealed container). We will observe water as a solid, a liquid and a gas and will note the changes to water when it is heated or cooled.

We will work scientifically by: grouping and classifying a variety of different materials; exploring the effect of temperature on substances such as chocolate, butter, cream (for example, to make food such as chocolate crispy cakes and ice-cream for a party). We might research the temperature at which materials change state, 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.