

## Aldermoor Farm Primary School – Science Knowledge Organiser

Topic: States of Matter

Year: Four

Strand: Chemistry

### What should I already know?

\*Distinguish between an object and the material from which it is made.  
\*Compare and group together a variety of everyday materials on the basis of their simple physical properties.

### What will I know by the end of the unit?

#### Lessons 1 and 2 - What are solids, liquids and gases?

Materials can be grouped according to whether they are solids, liquids or gases. Solids stay in one place and can be held. Liquids move around (flow) easily and are difficult to hold. Gases spread out to fill the available space and cannot be held.



#### Lesson 3 – What is particle theory?

Particles make up all materials. The particles are close together and arranged in a regular pattern in a solid. In a liquid, the particles are close together but arranged randomly. In a gas, the particles are randomly arranged and far apart.



**Solid      Liquid      Gas**

#### Lesson 4 – How do materials change state?

The process of changing from a solid to liquid is called melting. The reverse process of changing from a liquid to a solid is called freezing. The process of changing from a liquid to a gas is called evaporation. The reverse process of changing from a gas to a liquid is called condensation.



#### Lesson 5 – What is the state of water at different temperatures?

When solid water (ice) is heated to 0°C, it begins to melt. This is called its melting point. When liquid water is cooled to 0°C, it begins to freeze. This called its freezing point.



When liquid water is heated to 100°C, it begins to evaporate. This is called its boiling point. When gaseous water (water vapour) is cooled to 100°C, it begins to condense. This is called its condensing point.

#### Lesson 6 - Do all materials have the same melting and boiling points?

On Earth, temperatures range from around -80°C at their lowest to around 50°C at their highest. All materials that change state have different temperatures at which they melt or boil. A material's state on Earth depends on Earth's temperature.



### Vocabulary

<b>temperature</b>	The measure of warmth or coldness of an object.
<b>solid</b>	A substance that stays the same shape whether it is in a container or not.
<b>liquid</b>	A substance that can flow and take the shape of a container.
<b>gas</b>	A substance that has no fixed shape.
<b>evaporation</b>	The process of turning from a liquid into a gas.
<b>condensation</b>	The process of turning from a gas into a liquid.
<b>melting</b>	The process of turning from a solid into a liquid.
<b>freezing</b>	The process from turning from a liquid into a solid.

### Where will my learning go next?

In Year 5: Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution. Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating. Demonstrate that dissolving, mixing and changes of state are reversible changes. explain that some changes result in the formation of new materials and that this kind of change is not usually reversible.

<u>Science Concepts</u>	 Processes	 Forces	 Our Planet
 Living Things	 Survival	 Materials	 Working Scientifically