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| Parklands Primary School |
| **Topic-States of matter** | Year 4 | Strand - Chemistry |
| What should I already Know? | What will I know at the end of the unit? |
| * Why some materials are used for certain purposes because of their **properties**
* The **water cycle,** and the **processes** of **evaporation, condensation** and **precipitation.**
 | 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.**
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| condensation | small drops of water which form when **water vapour** or steamtouches 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 0oC. |
| 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 **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. |

 | 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.
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| 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.
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| 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.
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| What happens to the **particles** in waterwhen 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 0oC.
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| 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).
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| Question 1: The particles in a solid: | Start ofunit: | End ofunit: |  | Question 6: Name the process thatdescribes the change from water to ice. | Start of unit: | End of unit: |
| are closely packed together andvibrate |  |  |  |
| 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 7: Write solid, liquid or gas to label each part of the diagram. | Start of unit: | End of unit: |
|  |  |  |  |
| Question 2: The particles in a liquid (tick two): | Start ofunit: | End ofunit: |
| are closely packed together andvibrate |  |  |
| 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 ofunit: | End ofunit: |  | Question 8: Match these changes to thescientific name for the process. | Start ofunit: | End ofunit: |
| are closely packed together andvibrate |  |  |   |  |  |
| move freely over each other within acontainer in which they are held |  |  |
| can be poured |  |  |
| are very spread out and can escapean open container |  |  |
|  |
| Question 4: Match the states to their particle structure: | Start of unit: | End ofunit: |  | 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: |
|  |  |  | 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 |  |  |
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| Question 5: What is the freezingpoint of water? | Start ofunit: | End ofunit: | . | Question 10: Explain why puddles get smaller after it has rained | Start of unit: | End of unit: |
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