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| **ADVENT TERM  2****SCIENCE – Year 4 - Medium Term Planning – CHEMISTRY: STATES OF MATTER** |
| **LESSON  1**  | **LESSON  2**  | **LESSON  3**  |
| **LEARNING INTENTION:** To know that materials can be classed as a solid, liquid or gas.Skills: Group and sort materials into solids, liquids or gases.Aim: Develop scientific knowledge and conceptual understanding through the specific disciplines of chemistry. | **LEARNING INTENTION:** To know that particles make up all matter.Skills: Use scientific vocabulary to report and answer questions about their findings based on evidence collected.Aim:  Develop scientific knowledge and conceptual understanding through the specific disciplines of chemistry.  | **LEARNING INTENTION:** To know that some materials change state of matter when heat is added or removed.Skills: Observe and explain that some materials change state when they are heated or cooled.Aim: Develop understanding of the nature, processes and methods of science through different types of science enquiries that help them to answer scientific questions about the world around them. |
| **Key Vocabulary:** Solid, liquid, gas, state, matter, flow, pour, space, fixed, compressed, invisible, particle | **Key Vocabulary:** Matter, particles, close, far, arrangement, pattern, sold, liquid, gas | **Key Vocabulary:** Heat, cool, freeze, melt, evaporate, evaporation, condense, condensation, reversible |
| **Recap & retrieval:** | **Recall & retrieval:*** 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.
 | **Recall & retrieval:*** 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.
* All matter is made from tiny particles.
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| **Key Knowledge:** **Child:** * Solids stay in one place and can be held.
* Some solids can be squashed, bent, twisted and stretched.
* Liquids move around (flow) easily and are difficult to hold.
* Liquids take the shape of the container in which they are held.
* Gases spread out to fill the available space and cannot be held.

**Teacher:*** Examples of solids include wood, metal, plastic and clay.
* Examples of liquids include water, juice and milk.
* Examples of gases include oxygen, helium and carbon dioxide.
* Air is a mixture of gases.
 | **Key Knowledge:** **Child:** * All matter is made from tiny particles.
* In a solid, the particles are close together and arranged in a regular pattern.
* In a liquid, the particles are close together but arranged randomly.
* In a gas, the particles are randomly arranged and far apart.

**Teacher:*** Particles are single pieces of matter that are too small to be seen.
* The arrangement of particles in solids, liquids and gases explains their different properties.
 | **Key Knowledge:** **Child:*** Heating or cooling materials can bring about a change of state.
* This change of state can be reversible or irreversible.
* 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.

**Teacher:*** The temperature at which materials change state varies depending on the material.
* Water changes state from solid (ice) ⇌ liquid (water) at 0°C.
* Water changes state from liquid (water) ⇌ gas (water vapour) at 100°C.
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| **ADVENT TERM  2****SCIENCE – Year 4 - Medium Term Planning – CHEMISTRY: STATES OF MATTER** |
| **LESSON  4**  | **LESSON  5**  | **LESSON  6**  |
| **LEARNING INTENTION:** To know that freezing, melting, evaporation and condensation are all reversible changes.Skills: Take accurate measurements in standard units, using a range of equipment.Aim: Develop understanding of the nature, processes and methods of science through different types of science enquiries that help them to answer scientific questions about the world around them. | **LEARNING INTENTION:** To know that observations can be made regularly to identify changes over time.Skills: Make systematic, careful observations and comparisons, identifying changes and connections.Aim:  Develop understanding of the nature, processes and methods of science through different types of science enquiries that help them to answer scientific questions about the world around them. | **LEARNING INTENTION:** To know that a material’s state depends upon the Earth’s temperature.Skills: Measure or research the temperature in degrees Celsius (˚C) at which materials change state.Aim:  Develop understanding of the nature, processes and methods of science through different types of science enquiries that help them to answer scientific questions about the world around them.  |
| **Key Vocabulary:** Temperature, degrees, thermometer, melting point, freezing point, boiling point, condensing point, evaporation, condensation | **Key Vocabulary:** Data, line, line graph, curved, steep, flat, straight, shallow, observe, collect, record | **Key Vocabulary:** Liquid, gas, gaseous, water vapour, evaporation, melting point, boiling point |
| **Recall & retrieval:*** 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.
* All matter is made from tiny particles.
* 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.
 | **Recall & retrieval:*** 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.
* All matter is made from tiny particles.
* 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.
* When solid water (ice) is heated to 0°C, it begins to melt. This is called its melting point.
* When liquid water is heated to 100°C, it begins to evaporate. This is called its boiling point.
 | **Recall & retrieval:*** 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.
* All matter is made from tiny particles.
* 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.
* When solid water (ice) is heated to 0°C, it begins to melt. This is called its melting point.
* When liquid water is heated to 100°C, it begins to evaporate. This is called its boiling point.
* Many line graphs show changes over time.
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| **Key Knowledge:** **Child:*** Temperature is a measure of how hot or cold something is.
* It is measured in degrees using an instrument called a thermometer.
* When solid water (ice) is heated to 0°C, it begins to melt. This is called its melting point.
* When liquid water is heated to 100°C, it begins to evaporate. This is called its boiling point.
* The temperature when a liquid begins to freeze is called its freezing point.

**Teacher:*** In the United Kingdom, temperature is measured in degrees Celsius.
* Freezing, melting, evaporation and condensation are all reversible changes.
* The temperature when a gas begins to condense is called its condensing point.
 | **Key Knowledge:** **Child:*** Observations can be made regularly to identify changes over time.
* Many line graphs show changes over time.
* Flat lines mean there is no change over time.
* The steeper the line, the faster the change.

**Teacher:*** An observation involves looking closely at objects, materials and living things.
* A line graph is a way of displaying data that shows a relationship between two things, or variables.
* The line can be straight or curved and have flat sections or slopes that are shallow or steep.
 | **Key Knowledge:** **Child:*** Different materials have different melting and boiling points.
* A material's state on Earth depends on Earth's temperature.
* Water is a liquid on Earth when the temperature is above 0°C and solid when the temperature is below 0°C.
* Water vapour forms as part of the water cycle, when the Sun heats liquid water so it evaporates from seas, oceans, rivers and lakes.

**Teacher:*** On Earth, temperatures range from around -80°C at their lowest to around 50°C at their highest.
* The coldest temperatures are found in the polar climate zones.
* The highest temperatures are found in the desert and tropical climate zones.
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| **Assessment**  Cumulative quiz. Retrieval practice. |