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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. |
| **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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| **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. |
| **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. |
| **Assessment**   Cumulative quiz. Retrieval practice. | | |