ADVENT TERM 2 – CYCLE A SCIENCE – Year 4 and Year 3 - Medium Term Planning – CHEMISTRY: STATES OF MATTER		
LESSON 1	**LESSON 2**	**LESSON 3**
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.
LEARNING INTENTION: **Year 3** To know that materials can be classed as a solid, liquid or gas. **Year 4** To know and give reasons why materials can be classed as a solid, liquid or gas. **Skills: Disciplinary Knowledge** **Year 3** Group and sort materials into solids, liquids or gases. **Year 4** Compare, group and sort materials into solids, liquids or gases to help answer questions. **Aim:** Develop scientific knowledge and conceptual understanding through the specific disciplines of chemistry.	**LEARNING INTENTION:** **Year 3** To know that particles make up all matter. **Year 4** To know and explain the different ways that particles make up all matter. **Skills: Disciplinary Knowledge** **Year 3** Use scientific vocabulary to answer questions. **Year 4** 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:** **Year 3** To know that some materials change state of matter when heat is added or removed. **Year 4** To know that some materials change state of matter when heat is added or removed. (Describe examples). **Skills: Disciplinary Knowledge** **Year 3** Observe that some materials change state when they are heated or cooled. **Year 4** 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

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**
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.
LEARNING INTENTION: **Year 3** To know that freezing, melting, evaporation and condensation are all reversible changes. **Year 4** To know and explain how freezing, melting, evaporation and condensation are all reversible changes. **Skills: Disciplinary Knowledge** **Year 3**	**LEARNING INTENTION:** **Year 3** To know that observations can be made regularly to identify changes over time. **Year 4** To know and document observations regularly to identify changes over time. **Skills: Disciplinary Knowledge** **Year 3**	**LEARNING INTENTION:** **Year 3** To know that a material's state depends upon the Earth's temperature. **Year 4** To know that a material's state depends upon the Earth's temperature. Give and describe examples. **Skills: Disciplinary Knowledge** **Year 3**

Take accurate measurements in standard units, using a range of equipment. **Year 4** Take accurate measurements in standard units, using a range of equipment including thermometers and data loggers. **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.	Make systematic, careful observations and comparisons, identifying changes and connections. **Year 4** Make systematic, careful observations and comparisons, identifying differences, similarities or 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.	Measure or research the temperature in degrees Celsius (˚C) at which materials change state. **Year 4** Measure or research the temperature in degrees Celsius (˚C) at which materials change state to help answer questions. **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
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.	**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.	**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: • 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.	• 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.	**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.		