Meden School Curriculum Planning							
Subject	Chemistry	**Year Group**	7	**Sequence No.**	2	**Topic**	Physical and chemical change

Retrieval	Core Knowledge	Student Thinking
What do teachers need **retrieve** from students before they start teaching **new content**?	What **specific ambitious knowledge** do teachers need teach students in this sequence of learning?	What real life examples can be applied to this sequence of learning to **development of our students thinking, encouraging them to see the inequalities around them** and 'do something about them!'
KS2 Year 4 States of matter. There are three states of matter; solid, liquid and gases. **KS2 Year 4 Condensation and evaporation.** To change between the different states of matter, condensation and evaporation are used. Melting and dissolving are also processes used. **KS2 Years 5/6 Separating mixtures.** Different processes can be used to separate mixtures such as filtering, sieving and evaporation.	**L1: States of matter.** Each state of matter has specific **properties**. Solids do **not move**, have a **fixed shape** and **volume** and do **not flow** like liquids. They can be held. Liquids can **flow** or be poured easily. They will match the space of the container they are in as they do **not have a definite shape** but they do have a **fixed volume**. Gases will fill the shape of any container as they do **not have a fixed shape or volume**. They can **flow easily**. **L2: Particle model.** The particle model is used to explain how the particles in solids, liquids and gases are arranged. In a solid, the particles are **close together**, arranged in **layers** and **cannot move around**. In a liquid, the particles are arranged **randomly**, **close together** and can move a little bit over each other. In gases, the particles are **spread out** far apart from each other, have lots of **energy** and can move around easily. A g**as** is the only state that **can be compressed**, solids and liquids cannot be. **L3: Melting.** To change between states, energy is required. When a solid is **heated**, the particles gain more energy, they **vibrate** and eventually are able to **break free** from their fixed positions. This is **melting**. We call the **melting point** the temperature at which a solid melts to become a liquid and different substances have different melting points. The term melting point is also used to describe the temperature at which **a liquid freezes to become a solid**. Task is an investigation into the melting point of stearic acid. **L4: Evaporation.** Evaporation is the change of state between a liquid and a gas. The liquid has changed into a **gas at the surface of a liquid**. When heating a liquid, the particles gain **more energy**, this then means they **move faster** which **weakens the forces** holding them together. The liquid turns into a gas at its **boiling point**, when the particles have enough energy to break free of the forces holding them	

	together. Boiling point is also used to describe the temperature at which a **gas will become a liquid**. Factors that may affect the speed of evaporation include **temperature, wind speed, surface area and solvent** used. Melting point and boiling point data can be used to determine what state a substance is at a specific temperature. **L5: Condensation.** When gas particles such as water vapour hit a **cold surface**, they **condense back into a liquid**. The particles start to move **closer together**. On a **dry** day there is only a **little water vapour** in the air where as on a **damp day** there are a **lot of water vapour particles** in the air. **Solar stills** can be used in certain environments, such as the desert, to extract water from urine in order to drink. Lesson main task is to build own solar still. **L6: Freezing**. **Freezing point** is sometimes the term given to the temperature when a **liquid turns into a solid** (also known as the melting point). When a substance freezes, the **particles move closer together** as they don't have enough energy to overcome the **forces of attraction** between them, during this process energy is **given out**. We use antifreeze in our cars and rock salt on icy roads because it lowers the freezing point of water which means it takes longer for the water to turn into a solid. **Sublimation** is also a **rare change of state** which describes when a **solid turns straight into a gas** (or vice versa), it doesn't change into a liquid first. **L7: GPA.** Students complete a GPA task which collates all the key knowledge from previous lessons on the processes involved in changing state and what is happening to the particles. **L8: Heating and cooling curves.** Heating and cooling curves can be used to show **visually the energy changes** that happen when a substance changes state. Heating and cooling curves are a graph which has **temperature on the y axis** and **time on the x axis**. Flat parts to the graphs show the point at which the substance is melting/boiling or condensing/freezing. In a **heating** curve, the **flat** parts indicate where **energy is being used to weaken the forces** holding the particles together where as in a **cooling** curve, the flat parts indicate where the **forces are being strengthened**.	Why do some countries still have trouble accessing clean water to drink, cook or clean with?
KS2 Years 5/6 Reversible reactions. Some reactions are not reversible as new materials have been made but some changes such as dissolving, mixing and changing between states of matter are reversible.	**L9: Chemical reactions.** There are several indications that we might observe which tells us a chemical reaction has occurred. These include a **colour change, a change in temperature, bubbles of gas being produced and light being produced**. Task for the lesson is different practicals showing the different ways we can tell if a chemical reaction has occurred. **L10: Chemical and physical reactions.** Chemical reactions involve the **formation of new substances**. The products of the reaction cannot be changed back into the reactants, what they started off as. They are	

	irreversible. **Physical** reactions are **reversible**. No new substances are formed but there will be a change in appearance. In chemical reactions, the particles are **rearranged**. We start off with substances called **reactants** and end up with **products** being formed. **Word equations** are used to represent what is happening to reactants in a chemical reaction and what is formed at the end of it. We use **+** symbols and **arrow** symbols in these equations. **L11: Revision** **L12: EOTT/GPA**	