Meden School Curriculum Planning							
Subject	Chemistry	**Year Group**	9	**Sequence No.**	13	**Topic**	Periodic table

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!'
KS3: Year 8 – Atomic structure Atoms are small particles that make up everything, they are made of protons, neutrons, and electrons. Elements can be written as symbols. The periodic table contains all known elements. Year 8 – Chemical tests Ions are formed when atoms lose or gain electrons. Ions are charged particles. Metals always lose electrons and form positive ions, non-metals always gain electrons and form negative ions. Year 8 – Reactivity of metals Displacement reactions occur when one element replaces another in a reaction. The more reactive element can displace a less reactive one.	**L1: Electronic structure.** Electrons are found in shells, electrons shells with lowest energy always fill up first. The shells closest to the nucleus have the lowest energy. The first shell can have a maximum of 2 electrons, the second and third shells can have a maximum of 8 electrons each. Electron structure can be presented as dot and cross diagrams or as the electron numbers per shell separated by commas. **L2: Electronic structure and the periodic table.** Elements in the same group have the same number of electrons in the **outer shell**. Elements in the same period have the same number of electron shells. Elements in the same group in the same way. The number of electrons in the outer shell and the distance the outer shell is from the nucleus affect how reactive an element is. **L3: Group 0.** Group 0 contains the **noble gases**, these are **inert** elements. In a chemical reaction electrons are **shared** or **transferred**. Noble gases have a full outer shell so do not need to share or transfer electrons. The **reactivity** of an element depends on how easily it can get a full outer shell of electrons. Group 1 elements need to lose 1 electron to have a full outer shell, group 7 elements need to gain 1 electron to have a full outer shell. Group 0 elements are all gases at room temperature, they are very hard to detect because of their unreactiveness. Nobles gases are used in neon bulbs and as food preservatives. **L4: Forming ions.** An **ion** is formed when an atom loses or gains electrons. Atoms become ions in order to have a stable outer shell. An ion is a charged particle. **Metals** always lose electrons so will form positive ions. **Non-metals** always gain electrons so will form negative ions. When ions are drawn they are surrounded by square brackets and the charge is written at the top right. **L5: Group 1. Group 1 elements** are silvery solids, that have to be stored in oil. They have a very low density. They are soft metals with a low **melting point**. Group 1 elements are very reactive with water.	In the universe, helium is 2nd most abundant element. On Earth it is relatively rare, and one of the few elements that escapes gravity and leaks away into space. Helium is used I the manufacture of semiconductors and for MRI scanners so a shortage could have big impacts. Is it right to use helium for party balloons if it is so limited?

	When they react with water they produce a **metal hydroxide** and **hydrogen.** Reactivity increases down group 1, melting point and boiling point decrease down the group. Relative atomic mass increases down the group. Alkali metals burst into flames and form metal chlorides when heated and added to chlorine. They react with oxygen to form metal oxides. Lithium reacts to form lithium oxide. Sodium reacts to form a mixture of sodium oxide and sodium peroxide, potassium reacts to form a mixture of potassium peroxide and potassium superoxide. **L6: GPA Boiling and melting point analysis.** Graph drawing lesson. Boiling points increase down group 0 because the atoms get larger. The atoms have more electrons, the atoms have more **intermolecular forces** between them. More energy is needed to break these intermolecular forces. **L7: Reactivity of group 1.** Reactivity increases down group 1. Down group 1 the outer electrons gets further from the nucleus, meaning the **electrostatic force** to the nucleus is weaker. The outer electron is easier to lose if the electrostatic force is weaker, making the element more reactive. **L8: Reactivity of group 7.** Elements in group 7 are called **Halogens**. They are all non-metals, they all have coloured **vapours**. They have 7 electrons in the outer shell. Halogens exist in pairs of atoms, **diatomic molecules**. Reactivity decreases down the group, melting and boiling points increase down the group. Relative atomic mass increases down the group. As you go down the group the outer shell is further from the nucleus, meaning the electrostatic forces are weaker. This makes it harder for electrons to be gained, making the elements less reactive down the group. Halogens can undergo **displacement reactions**. The more reactive halogen will displace a less reactive halogen.	