Meden School Curriculum Planning							
Subject	Chemistry	**Year Group**	12	**Sequence No.**		**Topic**	3.2.1 - 3 Periodicity, Grps 2 & 7

Retrieval	Core Knowledge	Student Thinking
What do teachers need to **retrieve** from students before they start teaching **new content**?	What **specific ambitious knowledge** do teachers need to 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!'
GCSE Chemistry C1, Groups 1 and 7, A level Chemistry 3.1.1, atomic structure, including s,p,d sub-shells	**3.2.1.1 Classification** An element is classified as s, p, d or f block according to its position in the Periodic Table, which is determined by its proton number. **3.2.1.2 Physical Properties of Period 3 elements** The trends in atomic radius, first ionisation energy and melting point of the elements Na–Ar The reasons for these trends in terms of the structure of and bonding in the elements. Students should be able to: • explain the trends in atomic radius and first ionisation energy • explain the melting point of the elements in terms of their structure and bonding. **3.2.2 Group, The alkaline earth metals** The trends in atomic radius, first ionisation energy and melting point of the elements Mg–Ba Students should be able to: • explain the trends in atomic radius and first ionisation energy • explain the melting point of the elements in terms of their structure and bonding. The reactions of the elements Mg–Ba with water. The use of magnesium in the extraction of titanium from $TiCl_4$ The relative solubilities of the hydroxides of the elements Mg–Ba in water. $Mg(OH)_2$ is sparingly soluble.	The historical development of the Periodic Table and models of atomic structure provide good examples of how scientific ideas and explanations develop over time. Research opportunity Students could investigate the use of $BaSO_4$ in medicine.

	The use of Mg(OH)2 in medicine and of Ca(OH)2 in agriculture. The use of CaO or CaCO3 to remove SO2 from flue gases. The relative solubilities of the sulfates of the elements Mg–Ba in water. BaSO4 is insoluble. The use of acidified BaCl2 solution to test for sulfate ions. The use of BaSO4 in medicine. Students should be able to explain why BaCl2 solution is used to test for sulfate ions and why it is acidified. Students could test the reactions of Mg–Ba with water and Mg with steam and record their results. Students could test the solubility of Group 2 hydroxides by mixing solutions of soluble Group 2 salts with sodium hydroxide and record their results. Students could test the solubility of Group 2 sulfates by mixing solutions of soluble Group 2 salts with sulfuric acid and record their results. Students could test for sulfate ions using acidified barium chloride and record their results. **3.2.3.1 Group 7, Trends in Properties** The trends in electronegativity and boiling point of the halogens. Students should be able to: • explain the trend in electronegativity • explain the trend in the boiling point of the elements in terms of their structure and bonding. The trend in oxidising ability of the halogens down the group, including displacement reactions of halide ions in aqueous solution. The trend in reducing ability of the halide ions, including the reactions of solid sodium halides with concentrated sulfuric acid. The use of acidified silver nitrate solution to identify and distinguish between halide ions. The trend in solubility of the silver halides in ammonia. Students should be able to explain why: • silver nitrate solution is used to identify halide ions • the silver nitrate solution is acidified • ammonia solution is added. Students could carry out test-tube reactions of solutions of the halogens (Cl2, Br2, I2) with solutions containing their halide ions (eg KCl, KBr, KI).	

	Students could record observations from reactions of NaCl, NaBr and NaI with concentrated sulfuric acid. Students could carry out tests for halide ions using acidified silver nitrate, including the use of ammonia to distinguish the silver halides formed. **3.2.3.2 Uses of Chlorine and Chlorates** The reaction of chlorine with water to form chloride ions and chlorate(I) ions. The reaction of chlorine with water to form chloride ions and oxygen. Appreciate that society assesses the advantages and disadvantages when deciding if chemicals should be added to water supplies. The use of chlorine in water treatment. Appreciate that the benefits to health of water treatment by chlorine outweigh its toxic effects. The reaction of chlorine with cold, dilute, aqueous NaOH and uses of the solution formed. **Required practical 4** Carry out simple test-tube reactions to identify: Cations: Group 2 and Ammonium Ion Anions: Group 7 Halides, sulfate ions, carbonate ions, hydroxide ions	Research opportunity Students could investigate the treatment of drinking water with chlorine. Students could investigate the addition of sodium fluoride to water supplies. Compare the uses across the world. Consider the inequalities in the access to drinkable water across the world