Chemistry - Bonding, Structure & the properties of matter-Checklist

4.2.1 Chemical bonds, ionic, covalent and metallic	Taught	Practiced	Mastered
Define 'electrostatic forces of attraction'. Extended writing: describe why atoms bond in order to obtain a noble gas configuration/full outer level of electrons. Describe/draw the structure of common atoms and suggest how they could bond to obtain a full outer level of electrons.			
Tabulate common atoms and state the charges of the ions formed. Grade 9: explain an example of ionic bonding including detail on electron transfer, group numbers of the atoms involved and the use of correct terms, eg cation and anion.			
Extended writing: describe the bonding in the sodium chloride lattice using the correct terms, eg electrostatic forces of attraction.			
Extended writing: describe the difference between simple covalent substances and giant covalent substances. Grade 9: explain an example of covalent bonding including detail on electron transfer, group numbers of the atoms involved and the use of correct terminology.			
Define 'delocalised electrons'.			

4.2.2 How bonding and structure are related to the properties of substances	Taught	Practiced	Mastered
Extended writing: describe the properties of matter in a solid, liquid and gas. Define melting point and boiling point. Grade 9: explain the differences in changes of state in terms of intermolecular forces of attraction between a short molecule ie methane and a longer molecule ie pentane.			
Describe balanced symbol equations including the states of matter.			
Extended writing: describe the electrical conductivity of ionic substances. Extended writing: explain why solid ionic substances do not conduct electricity but dissolved or molten ionic substances do conduct electricity. Grade 9: explain how ionic substances dissolve in water. Extended writing: explain why sodium chloride is difficult to melt.			
Extended writing: describe melting points and boiling points of covalent substances. Extended writing: explain why the melting point and boiling point increases as the size of the molecule does in terms of intermolecular forces. Extended writing: explain why covalent substances do not conduct electricity. Grade 9: explain why pure water does not conduct electricity but tap water does conduct electricity.			
Extended writing: explain how ethene polymerises.			
Extended writing: describe the structure of diamond, silicon dioxide and graphite. Extended writing: explain how covalent substances boil.			
Extended writing: describe melting points and boiling points of metallic substances. Extended writing: explain why the melting point and boiling point of metallic substances are high. Extended writing: describe the structure of metal alloys.			
Extended writing: explain why metallic substances conduct electricity.			

4.2.3 Structure and bonding of carbon	**Taught**	**Practiced**	**Mastered**
Extended writing: link the properties of diamond to the structure.			
Extended writing: link the properties of graphite to the structure. Extended writing: explain why graphite conducts electricity.			
Extended writing: link the properties of graphene to the structure. Extended writing: describe the history of fullerenes.			

4.2.4 Bulk and surface properties of matter including nanoparticles	Taught	Practiced	Mastered
Extended writing: describe the history of nanoscience.			
Extended writing: link the uses of nanoparticles to their properties. Extended writing: evaluate the use of nanoparticles in applications, eg sun cream.			