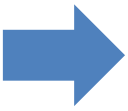
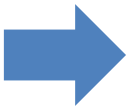
YEAR: 11 **SUBJECT: Science (Double Award) Chemistry**

Knowledge Focus: 5.1 Structre and bonding, 5.2 Acids, bases and salts, 5.3 Metals and their extraction.

Skills, knowledge and understanding to be developed in this Learning Plan:	**Key terms to be learned in this LP:**
Describe and explain the properties of substances. How to write accurate symbol equations for reactions. Identifying the products of reactions. Identify and explain reactions of substances. Perform accurate practicals to obtain high quality products. Explain the stages of a practical.	Acid Base Oxidation Reduction Electrolysis

***Weeks 1 - 2 Learning Objectives*: 5.1 Structure and bonding** Properties of metals and non-metals. Bonding found within metals. Use electron structure to form covalent bonds using shared pairs of electrons. Properties of giant and simple ionic structures and how these relate to their uses. Properties and uses of carbon allotropes. Properties and uses of nanoparticles including silver and titanium.	***Objective assessments:*** Be able to: Describe the properties of metals and non-metals. Explain how the properties of metals make them appropriate for certain jobs. Link the properties of metals to their structure. Draw diagrams to show covalent and ionic bonding. Describe and explain the properties of nanoparticles and link this to their uses.	**Homework/Gwaith cartref:** **1) Drawing diagrams showing different bonding types.** Set: Due: **2) 6-mark QER describing the properties and uses of metals.** Set: Due:
***Week 3 Learning Objectives:* 5.2 Acids, bases and salts** Define acids, bases, and salts in terms of pH. Describe acids and bases in terms of ions present (H^+ or OH^-). Write neutralization reactions to make water as a product. **Neutralisation as the reaction of H^+ and OH^- ions (HT only).**	***Objective assessments:*** Be able to: Determine the pH of a substance. Identify acids and bases using the pH scale. Formulate accurate symbol and word equations for neutralisations reactions. Explain how neutralization reactions work in terms of reacting ions.	**Homework/Gwaith cartref:** **Forming compounds using common ions.** Set: Due:
Weeks 4-5 Learning Objectives:* 5.2 Acids, bases and salts.** ***Preparation of insoluble and soluble crystals from carbonate *** ***Preparation of salts through titrations Naming salts based on acids and metal compounds being reacted. Reactions of metals compounds with acids (metal oxides, hydroxides and carbonates). Tests used to identify carbonate (CO_3^{2-}) and sulphate ions (SO_4^{2-}). ***Specified practical***	***Objective assessments:*** Be able to: Prepare quality salt crystals using filtration and evaporation. Prepare quality crystals using titrations. Test salt solutions for pH. Write word and symbol equations for metal/acid reactions. Perform chemical tests to identify carbonate and sulphate ions within a compound. Assessment: 5.1 & 5.2 End of Topic	**Homework/Gwaith cartref:** **Acid/metal reaction questions.** Set: Due:

Week 6 Learning Objectives: **5.3 Metals and their extraction.** Which ores are metals extracted from. Relative reactivity of metals as demonstrated in displacement reactions. Unreactive metals being found in their native form. Reduction and oxidation in terms of gaining or losing oxygen. The industrial extraction of iron in the blast furnace including equations at each step. Reactants and products involved in the extraction of iron in the blast furnace.		***Objective assessments:*** Be able to: Describe why some metals are found as ores and some are found native. Identify the relative reactivity of metals based on displacement reactions. Identify oxidation and reduction reactions in terms of gaining or losing oxygen. Explain how the blast furnace uses metal reactivity to extract iron from its ore.	**Homework/Gwaith cartref:** Set: Due:
Week 7 Learning Objectives: **5.3 Metals and their extraction.** The electrolysis of lead bromide and aluminium oxide. Oxidation and reduction in terms of losing and gaining electrons. Identify the reactions at the anode and cathode during electrolysis. The factors that need to be considered when building and electrolysis plant including; transport, workforce, materials and electricity available.		***Objective assessments:*** Be able to: Describe the process of electrolysis. Identifying the factors affecting the sustainability of extracting metals. Write ionic equations to explain the reactions happening at the anode and cathode.	**Homework/Gwaith cartref:** Set: Due: