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|  | **Half term points** | | | | | |
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| **AUTUMN 1** | **AUTUMN 2** | **SPRING 1** | **SPRING 2** | **SUMMER 1** | **SUMMER 2** |
| **Atoms, bonding, and moles**  **Mini assessment:** Draw the electronic structure and write the electron configuration for the first 20 elements in the periodic table. Given a number of examples (eg. Sodium chlorine, fluorine, oxygen, magnesium oxide) identify whether the bonding is covalent or ionic and draw the bond. | | **Chemical reactions, energy changes, and moles**  **Mini assessment:** Calculation practice:  **Separate and combined higher only:** calculating limiting reactants. Aluminium reacts with iron oxide, Fe2O3, to give iron metal and aluminium oxide, Al2O3. a. Write a balanced equation b. 32g of iron oxide reacted with 16.2g of aluminium, what is the limiting reactant?  Describe and explain how positive and negative ions become neutral atoms in electrolysis **and** complete several half equation examples  **Combined foundation only:**  A student had a solution of sodium chloride with a conc of 93.6 g/dm3. calculate the mass of sodium chloride dissolved in 25cm3 of the solution.  Describe and explain how positive and negative ions become neutral atoms in electrolysis. | | **Rates of Reaction**  **Mini assessment:** Required Practical write up: How does concentration effect the rate of a reaction?  Aim, method, results, conclusion and analysis  Extended response: Describe how the size of hydrocarbon effects the viscosity, volatility and boiling point. How is this utilised in fractional distillation of crude oil? | |
| **Key skills and knowledge assessed:**   * Show electronic configurations in the form 2.8.1 and as diagrams. * Explain the links between an element’s position in the periodic table and its electronic configuration. * Predict the electronic configurations of the elements hydrogen to calcium. Describe how the periodic table is arranged (in terms of elements in groups of similar properties). * Recognise/draw/interpret diagrams * Translate from data to a representation with a model. * Use models in explanations, or match features of a model to the data from experiments of observations that the model describes of explains. * Describe how the different types of bonds and structures are formed. * Describe the basic differences between covalent, simple molecules and giant covalent structures. * Explain how covalent bonds are formed. * Visualise and represent 2D and 3D forms including two-dimensional representations of 3D objects. | | **Key skills and knowledge assessed:**   * Calculate the number of moles of particles in each mass of a certain substance and vice versa. [H] * Explain that the mass of a product formed in a reaction is controlled by the mass of reactant that is not in excess. [H] * Be able to calculate concentrations of solutions and being able to express these in grams per decimetre squared. * Understand how the mass of a solute and the volume of a solution is related to the concentration of the solution. * Use ratios, fractions, and percentages. * Use SI units and IUPAC chemical nomenclature unless inappropriate. * Use an appropriate number of significant figures in calculations. * Describe the movement of ions in electrolysis. * Describe what happens when a given displacement reaction occurs. * Explain how oxidation and reduction happen during electrolysis * Describe/suggest/select the technique, instrument, apparatus, or material that should be used for a particular purpose and explain why. * Suggest a hypothesis to explain given observations of data. | | **Key skills and knowledge assessed:**   * Rate of reaction is dependent upon the concentration of reactants and this can speed up or slow down a reaction. * Use observations to decide whether a chemical reaction has taken place. * Describe how fractions separate in fractional distillation * Explain how the properties of a substance depend on the bonding and arrangement of atoms (in terms of strength and number of bonds only). | |
| **Meaningful homeworks:**  Students to produce a table with the protons, neutrons and electrons for the first 20 elements. Research 3 compounds that use ionic bonding and 3 that use covalent bonding. Explain what an ionic bond is and what a covalent bond is. Following this, complete the GCSE Pod and exam style questions. | | **Meaningful homeworks:**  Research what electrolysis is and why it is used. Students to give an overview of the process and reasons to why it is necessary. Higher: Write a guide to explain how to calculate limiting reactants.  Foundation: Write a guide to explain how to calculate mass of dissolved solids in a solution. . Following this, complete the GCSE Pod and exam style questions. | | **Meaningful homeworks:**  Research four ways in which rate of reaction can be changed, pick one and write a method to describe how you would investigate it. Research the properties of long and short chain hydrocarbons. Following this, complete the GCSE Pod and exam style questions. | |