| | Year 10 Chemistry | | | | | |
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| | Autumn Term 1 | Autumn Term 2 | Spring Term 1 | Spring Term 2 | Summer Term 1 | Summer Term 2 |
| **BIG Q**<br>Content<br>*(max 5)*<br><br>Please log into Seneca to support your child to understand this learning | ***How does the organisation of elements in the periodic table help us make sense of the physical and chemical properties of elements?***<br>Describe the structure of the atom and understand how elements, compounds and mixtures are different.<br>Explain how models of atomic structure and the development of the periodic table provide examples of how scientific ideas and explanations change over time.<br>Calculate the number of and describe the arrangement of subatomic particles in atoms of isotopes and ions.<br>Predict and explain the reactions and properties of elements in Groups 1, 7 and 0. | ***How do scientists use their knowledge of structure and bonding to explain the properties of a substance and to engineer new materials with desirable properties?***<br>Describe how the three different types of bonds (metallic, ionic and covalent) are formed.<br>Predict the states of substances at given temperatures and identify state symbols.<br>Describe the structure formed by metals and when atoms form covalent bonds and use this to explain the properties of metals and alloys.<br>Describe the structure formed by ionic compounds and use this to explain their properties. | ***How do scientists and manufacturers determine the precise amounts of reactants needed to produce a specific quantity of product?***<br>Use the law of conservation of mass to calculate masses of products and reactants.<br>Construct balanced symbol equations.<br>Explain why repeated chemical measurements produce a range of values.<br>Calculate concentration and use this to compare concentrated and dilute solutions,<br>Calculate the mass of product formed in grams or amount in moles from given masses of reactants (HT only). | ***How does knowing about different chemical changes mean that scientists can predict exactly what new substances will be formed so they can go on to develop a wide range of different materials and processes?***<br>Use the reactivity series to determine a method to extract a given metal from its ore.<br>Explain what the pH scale shows us and describe methods to measure pH.<br>Write equations to represent the reactions of acids (with metals and bases).<br>Describe a method to produce a soluble salt.<br>Compare strong and weak acids and describe oxidation and reduction in terms of electrons (HT only). | ***How can electricity be used to separate a compound into its elements?***<br>Predict the products of the electrolysis of molten compounds.<br>Describe how aluminium is extracted from its ore.<br>Predict the products of the electrolysis of solutions.<br>Describe observations of the electrolysis of aqueous solutions.<br>Represent the reactions at electrodes using half equations (HT only). | ***How does our knowledge of energy changes in reactions help scientists design new products?***<br>Distinguish between exothermic and endothermic reactions.<br>Evaluate uses and applications of exothermic and endothermic reactions.<br>Construct reaction profiles.<br>Use reaction profiles to identify reactions as exothermic or endothermic.<br>Explain what activation energy is. |
| Vocabulary<br>*(max 10)*<br><br>Please use your child's knowledge notes to help them learn these words | Atom<br>Alkali metals<br>Compound<br>Element<br>Halogens<br>Ion<br>Isotope<br>Noble gases<br>Plum pudding model<br>Periodic table | Alloy<br>Covalent bond<br>Delocalised electrons<br>Fullerene<br>Intermolecular forces<br>Small molecule<br>Giant ionic lattice<br>Ionic bond<br>Metallic bond<br>Polymer | Anomalous result<br>Concentration<br>Conservation of mass<br>Relative atomic mass ($A_r$)<br>Relative formula mass ($M_r$)<br>Thermal decomposition<br>Uncertainty<br>Avogadro constant (HT only)<br>Limiting reactant (HT only)<br>Mole (HT only) | Acid<br>Alkali<br>Base<br>Displacement reaction<br>Metal ore<br>Neutralisation<br>Oxidation<br>Reactivity series<br>Reduction<br>Salt | Anode<br>Aqueous<br>Cathode<br>Electrode<br>Electrolysis<br>Electrolyte<br>Solution<br>Half Equation (HT Only)<br>Oxidation (HT Only)<br>Reduction (HT Only) | Activation Energy<br>Control Variable<br>Dependent Variable<br>Endothermic<br>Exothermic<br>Independent Variable<br>Overall Energy Change<br>Reaction Profile<br>Bond energy (HT only) |
| Catholic Link | Life and Dignity of the Human Person: Every human has inherent value, just as every atom has a unique identity. | Call to Family, Community, and Participation: Lone atoms are unstable on their own. They "participate" in bonding to achieve stability. | Solidarity: The total mass of the universe is constant and shared by every living thing. | Call to Family, Community, and Participation: We rely on a shared water supply. Keeping water at a neutral pH ensures collective safety | The Dignity of Work: Industrial workers have a right to fair wages, regulated hours, and union representation. | Life and Dignity of the Human Person: Chemical reactions provide essential warmth and cook food. |
| Careers Link | Particle Physicist, Nuclear Physicist, Organic Chemist | Materials Chemist, Material Engineer, Mechanical Engineer | Chemical Engineer, Analytical Chemist, Organic Chemist | Organic Chemist, Medicinal Chemist, Industrial Chemist | Materials Engineer, Electrical Engineer, Materials Chemist | Renewable Energy Scientist, Chemistry Researcher |

Ways to enrich the Y10 Chemistry curriculum at home:

- Use this simulation for further your understanding of the alpha scattering investigation https://phet.colorado.edu/sims/html/rutherford-scattering/latest/rutherford-scattering_all.html
- Explore the Royal Society of Chemistry interactive periodic table https://periodic-table.rsc.org/
- Use the online simulators to recap the required practicals for paper 1: https://www.focuselearning.co.uk/programmes/?programme=rp-chemistry&frompack=20