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| **Subject** | **Y8 Chemistry Threshold Concepts – Autumn Term** | **How to support students’ learning** |
| The periodic table, elements and groups | **Development of the Periodic table 1**   * Define a property * List the names of the Scientists who contributed to the development of the Periodic table including their ideas * Recall the key ideas that Mendeleev contributed to the development of the Periodic table * Locate groups and periods on the Periodic table and split into metals and non-metals * Name and state the position of the subatomic particles   **Development of the Periodic table 2**   * Name and state the position of the subatomic particles * Recall the charge and mass of PEN * State the number of PEN in an atom using the Periodic table * Draw the electron configuration of an atom * State the relationship between an atoms electron configuration and the group and period it is in   **Chemical reactions**   * State the number of electrons in an elements outer shell using the Periodic table * Define a chemical reaction * Recall the difference between a chemical and physical change and suggest indicators or a chemical reaction * Recall that chemical reactions occur so that atoms can become more stable * Define an ion * Determine the charge on an ion using the Periodic table * Determine the charge on ions using the Periodic table * Determine the formula of ionic compounds   **Understanding equations**   * Identify reactants and products * State that in a chemical reaction atoms are rearranged and no atoms are gained or lost * Recall the formula of common elements and compounds * Determine the formula of ionic compounds * Write balanced symbol equations   Interpret balanced symbol equations in terms of ratios  **Elements and groups (group 2)**   * Describe patterns in the properties of the group 2 elements * Write word and balanced equations for the reactions of the group 2 elements with water * Relate reactivity to electron configuration   Predict reactivity of other elements in group 2 and group 1 metals  **Group 7 displacement reactions**   * Describe patterns in the properties of the group 7 elements * Write word and balanced equations for the displacement reactions of the halogens * Relate reactivity to electron configuration   Predict reactivity of other elements in group 7  **Group 0**   * Describe the physical properties of the group 0 elements * From data presented in bar charts, describe patterns in the melting and boiling points of the Group 0 elements. * Use patterns to predict properties of group 0 elements. * Use electron configuration to predict and explain the reactivity of the group 0 elements | Encourage your child to watch this video about the development of the periodic table [Development of the Periodic Table - GCSE Chemistry - YouTube](https://www.youtube.com/watch?v=cYU7EsqWLcU)  Encourage your child to visit BBC bitesize to learn about the electronic structure of atoms  [Electronic configurations and the periodic table - The periodic table - Edexcel - GCSE Combined Science Revision - Edexcel - BBC Bitesize](https://www.bbc.co.uk/bitesize/guides/z36cfcw/revision/4)  Encourage your child to watch this video on atoms and ions [GCSE Chemistry - Atoms & Ions #1 - YouTube](https://www.youtube.com/watch?v=fN8kH9Vvqo0)  Encourage your child to watch this video on chemical equations [GCSE Chemistry - Balancing Chemical Equations #4 - YouTube](https://www.youtube.com/watch?v=qquOFYOpdl0)  Encourage your child to read the information on BBC bitesize on trends in the periodic table [Patterns and trends in the periodic table - Periodicity - Higher Chemistry Revision - BBC Bitesize](https://www.bbc.co.uk/bitesize/guides/zxc99j6/revision/6) |
| **Subject** | **Year 8 Chemistry Threshold Concepts – Spring Term** | **How to support students’ learning** |
| Reactions of metals | **Acids and metals**   * State that metals react with acids to form salts and hydrogen gas * Recall indicators of a chemical reaction * Represent reactions using word and balanced symbol equations * Use patterns in reactions to make predictions about other reactions * Carry out and recall the test for hydrogen gas   **Acids and metal oxides**   * State that acids react with metal oxides to produce a salt and water * Recall indicators of a chemical reaction * Represent reactions using word and balanced symbol equations   **Making salts**   * State that when an acid is added to an alkali, neutralisation takes place, and a salt and water is produced * Describe how to obtain a neutral solution from an acid and an alkali * Represent reactions using word and balanced symbol equations   **Acids and metal carbonates**   * State that acids react with metal carbonates to produce a salt, carbon dioxide and water * Recall indicators of a chemical reaction * Carry out and recall the test for carbon dioxide gas * Represent reactions using word and balanced symbol equations   **Making and naming salts**   * Represent reactions using word and balanced symbol equations * Recall the rules for naming salts * Plan a method to prepare a solid sample of a names salt   **The reactivity series**   * Using observations, identify an order of reactivity of metals * Use the reactivity series to make s sensible prediction about a reaction * Write word and balanced symbol equations   **Metal ores and mining**   * Link the reactivity of a metal to its use * Define an ore * Give an example of a native metal * Suggest a method of extraction for a metal using the reactivity series * Write word and symbol equations for reactions   **Displacement reactions**   * Use the reactivity series to predict whether a reaction will happen or not * Recall indicators of a chemical reaction * Write word and symbol equations for reactions | Encourage your child to read this information about metals reacting with acids [What is an acid and metal reaction? - BBC Bitesize](https://www.bbc.co.uk/bitesize/topics/zn6hvcw/articles/zvfxxbk)    Encourage your child to watch this video about making and naming salts [Making Salts - YouTube](https://www.youtube.com/watch?v=mKnLhMYu1K4)  Encourage your child to watch this video about the reactivity series [Reactivity Series of Metals | Environmental | Chemistry | FuseSchool - YouTube](https://www.youtube.com/watch?v=TGPPPFczOj0)  Encourage your child to read this page on BBC bitesize about the extraction of metals from their ores [Extracting iron and copper - Reactions of metals - AQA - GCSE Chemistry (Single Science) Revision - AQA - BBC Bitesize](https://www.bbc.co.uk/bitesize/guides/zsm7v9q/revision/3) |
| **Subject** | **Year 8 Chemistry Threshold Concepts – Summer Term** | **How to support students’ learning** |
| Energetics and rates | **Rate of reaction**   * Recall key features of a chemical reaction * Define rate of reaction * Define the activation energy * Identify variables * Suggest methods to measure the rate of a chemical reaction   **Rate graphs**   * Recall the factors that affect the rate of reaction * explain the factors that effect the rate of reaction using the collision theory * identify anomalous results and describe why they are anomalous * draw a suitable graph to represent results * use a graph to describe the relationship between variables   **Concentration**   * State how changing the concentration effects the rate of a chemical reaction * Explain how changing the concentration effects the rate using the collision theory   **Surface area**   * State how changing the surface area effects the rate of a chemical reaction * Explain how changing the surface effects the rate using the collision theory * describe how the surface area of a solid can be increased * calculate the surface area and volume of a simple cube * explain how increasing the surface area increases the rate of reaction   **Catalysts**   * Define a catalyst. * Describe the role of a catalyst * define activation energy * Explain how a catalyst works and explain why they are useful in industrial processes.   **Exothermic and endothermic reactions**   * Define endothermic and exothermic reactions * List examples of endothermic and exothermic reactions * Predict if a reaction is endothermic or exothermic given appropriate data * State that bond breaking absorbs energy and bond making releases energy * Explain whether a reaction will be exothermic or endothermic using bond energy data   **Oxidation reactions – metal and non-metal oxides**   * Define an oxidation reaction * Write word and balanced equations for oxidation reactions * Predict the pH of oxidation reactions   **Complete and incomplete combustion**   * Predict the products of a combustion reaction * State the differences between complete and incomplete combustion * Classify thermal decomposition as endothermic or exothermic * Compare the pros and cons of fuels in terms of their products of combustion * Recall the environmental pollutants from burning fuels and their environmental affects   **Thermal decomposition**   * Define thermal decomposition * Classify thermal decomposition as endothermic or exothermic * Write word and balanced symbol equations for thermal decomposition reactions * Explain observations about changes in mass in a thermal decomposition reaction * Investigate the rate of thermal decomposition of different metal carbonates * Calculate missing masses in conservation of mass calculations | Encourage your child to complete the online learning about chemical and physical changes  [What is the difference between physical and chemical changes? (thenational.academy)](https://classroom.thenational.academy/lessons/what-is-the-difference-between-physical-and-chemical-changes-64upcr)  Encourage your child to watch this video on how to calculate the rate of a reaction using a graph [GCSE Chemistry - How to Calculate the Rate of Reaction - Measuring Rate of Reaction #48 - YouTube](https://www.youtube.com/watch?v=GCR5xeduq2o)  Encourage your child to visit BBC bitesize to learn about the factors that can affect the rate of a chemical reaction [Rate of reaction - Rates of reaction - AQA - GCSE Combined Science Revision - AQA Trilogy - BBC Bitesize](https://www.bbc.co.uk/bitesize/guides/zpkp7p3/revision/1)  Encourage your child to read about a catalyst and what a catalyst can do to a reaction  [Catalysts - Rates of reaction - AQA - GCSE Combined Science Revision - AQA Trilogy - BBC Bitesize](https://www.bbc.co.uk/bitesize/guides/zpkp7p3/revision/5)  Encourage your child to watch this video on exothermic and endothermic reactions [GCSE Chemistry - Exothermic and Endothermic Reactions #43 - YouTube](https://www.youtube.com/watch?v=dstRL5xB0Sk)  Encourage your child to read about combustion  [Combustion of hydrocarbon fuels - Polluting the atmosphere - AQA - GCSE Chemistry (Single Science) Revision - AQA - BBC Bitesize](https://www.bbc.co.uk/bitesize/guides/zxy4xfr/revision/5)  Encourage your child to watch this video on thermal decomposition reactions  [Thermal Decomposition - YouTube](https://www.youtube.com/watch?v=fwukX8Ec-Pg) |