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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) |