

Subject	Y9 Chemistry Threshold Concepts – Autumn Term	How to support students' learning
Atomic structure and the periodic table	<p>Atoms, elements and compounds</p> <p>Use the names and symbols of the first 20 elements in the periodic table, the elements in Groups 1 and 7, and other elements in this specification</p> <ul style="list-style-type: none"> • Name compounds of these elements from given formulae or symbol equations • Write word equations for the reactions in this specification • Write formulae and balanced chemical equations for the reactions in this specification <p>(HT only) Write balanced half equations and ionic equations where appropriate</p> <p>Mixtures</p> <ul style="list-style-type: none"> • Describe, explain and give examples of the specified processes of separation • Suggest suitable separation and purification techniques for mixtures when given appropriate information <p>The development of the model of the atom</p> <ul style="list-style-type: none"> • Why the new evidence from the scattering experiment led to a change in the atomic model • The difference between the plum pudding model of the atom and the nuclear model of the atom <p>Relative electrical charges of subatomic particles</p> <ul style="list-style-type: none"> • Students should be able to use the nuclear model to describe atoms 	<p>Encourage your child to watch this video on atoms and ions GCSE Chemistry - Atoms & Ions #1 - YouTube</p> <p>And this video on compounds, molecules and mixtures GCSE Chemistry - Differences Between Compounds, Molecules & Mixtures #3 - YouTube</p> <p>Encourage your child to visit BBC bitesize to learn about the changes to the atomic model Developing the atom - Models of the atom - AQA - GCSE Physics (Single Science) Revision - AQA - BBC Bitesize</p>

	<p>Size and mass of atoms</p> <ul style="list-style-type: none">• Students should be able to calculate the numbers of protons, neutrons and electrons in an atom or ion, given its atomic number and mass number• Students should be able to relate size and scale of atoms to objects in the physical world <p>Relative atomic mass</p> <ul style="list-style-type: none">• Students should be able to calculate the relative atomic mass of an element given the percentage abundance of its isotopes <p>Electronic structure</p> <ul style="list-style-type: none">• Students should be able to represent the electronic structures of the first twenty elements of the periodic table in both forms (number and diagram) <p>The Periodic table</p> <ul style="list-style-type: none">• Explain how the position of an element in the periodic table is related to the arrangement of electrons in its atoms and hence to its atomic number• Predict possible reactions and probable reactivity of elements from their positions in the periodic table <p>Development of the Periodic table</p> <ul style="list-style-type: none">• Students should be able to describe the steps in the development of the periodic table	<p>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</p> <p>Encourage your child to watch this video about the development of the periodic table Development of the Periodic Table - GCSE Chemistry - YouTube</p>
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	<p>Metals and non metals</p> <ul style="list-style-type: none"> • Explain the differences between metals and non-metals on the basis of their characteristic physical and chemical properties • Explain how the atomic structure of metals and non-metals relates to their position in the periodic table • Explain how the reactions of elements are related to the arrangement of electrons in their atoms and hence to their atomic number <p>Group 0</p> <ul style="list-style-type: none"> • Explain how properties of the elements in Group 0 depend on the outer shell of electrons of the atoms • Predict properties from given trends down the group <ul style="list-style-type: none"> • Explain how properties of the elements in Group 1 depend on the outer shell of electrons of the atoms • Predict properties from given trends down the group <p>Group 7</p> <ul style="list-style-type: none"> • Explain how properties of the elements in Group 7 depend on the outer shell of electrons of the atoms • Predict properties from given trends down the group 	<p>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</p>
<p>Reactions of metals</p>	<p>Metal oxides</p> <ul style="list-style-type: none"> • Explain reduction and oxidation in terms of loss or gain of oxygen. 	<ul style="list-style-type: none"> • Encourage your child to watch this video on the reactivity series and the reactivity of metals with water and oxygen GCSE Chemistry - Reactivity Series of Metals & Displacement Reactions #37 - YouTube

The reactivity series

- Recall and describe the reactions, if any, of potassium, sodium, lithium, calcium, magnesium, zinc, iron and copper with water or dilute acids and where appropriate, to place these metals in order of reactivity
- Explain how the reactivity of metals with water or dilute acids is related to the tendency of the metal to form its positive ion
- Deduce an order of reactivity of metals based on experimental results.

Extraction of metals and reduction

- Interpret or evaluate specific metal extraction processes when given appropriate information
- Identify the substances which are oxidised or reduced in terms of gain or loss of oxygen.

Oxidation and reduction in terms of electrons (HT only)

- ***Write ionic equations for displacement reactions***
- ***Identify in a given reaction, symbol equation or half equation which species are oxidised and which are reduced.***

- 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](#)

Encourage your child to watch this video on how to write ionic equations for oxidation and reduction reactions [Ionic Equations - GCSE Chemistry Revision - YouTube](#)