

## Summer Assessment Topics for Revision

Year : 13

Subject: Btec Pearson Chemistry Unit 1

In class assessment (Optional for subjects):

### Topics to revise for April Assessment

Unit	Topic Title
Understand the electronic structure of atoms:	<ul style="list-style-type: none"><li>• know that atoms have electron shells / energy levels which consist of subshells (s, p and d)</li><li>• know the number and type of subshells in the first four energy levels</li><li>• know how to place these subshells in order of increasing energy</li><li>• be able to write the electronic structure (configuration) of the first 36 elements of the periodic table using s, p and d subshell notation</li></ul>
Understand metallic bonding:	<ul style="list-style-type: none"><li>• be able to predict if a substance has metallic bonding from its name or symbol</li><li>• know that the structure of a metal is a lattice of positive metal ions surrounded by delocalised electrons</li><li>• know that metallic bonding is the electrostatic attraction between the nuclei of the positive metal ions and the delocalised electrons</li><li>• understand that delocalised electrons are formed by the loss and free movement of the outer shell electrons from the metal atoms</li><li>• understand that electrostatic attraction between positive ions and delocalised electrons can occur in any direction</li><li>• understand that a giant metallic structure is a lattice of many atoms held together in regular layers by metallic bonding</li><li>• be able to describe or draw diagrams to show the structure of a metal and metallic bonding</li><li>• understand how the chemical and physical properties of metals, such as melting and boiling point, malleability, ductility and electrical conductivity, are affected by their bonding and structure</li></ul>
First ionisation energy	<ul style="list-style-type: none"><li>• know that the first ionisation energy is the energy required to remove one mole of electrons from one mole of atoms in their gaseous state</li><li>• understand why first ionisation is always an endothermic process</li><li>• be able to write an equation to show first ionisation energy for an element using the general equation, <math>X(g) \rightarrow X^+(g) + e^-</math></li></ul>
Understand ionic bonding:	<ul style="list-style-type: none"><li>• be able to predict whether a compound has ionic bonding from its name or formula</li><li>• be able to predict the formula of an ionic compound from its elements ( for groups 1, 2, 3, 6 and 7)</li><li>• understand how the physical properties of ionic substances, such as melting and boiling point, solubility and electrical conductivity, are affected by their bonding and structure</li></ul>
Balanced equations	<ul style="list-style-type: none"><li>• know the formula of common substances such as water, carbon dioxide, oxygen, hydrogen, nitrogen and the halogens</li></ul>

	<ul style="list-style-type: none"> <li>• be able to work out the formulae of common ions of elements from their position in the periodic table</li> <li>• know the formulae of ions containing more than one element, such as hydroxide (OH<sup>-</sup>), carbonate (CO<sub>3</sub><sup>2-</sup>), sulfate (SO<sub>4</sub><sup>2-</sup>), nitrate (NO<sub>3</sub><sup>-</sup>), ammonium (NH<sub>4</sub><sup>+</sup>)</li> <li>• be able to work out the formulae for ionic compounds from the charges on their ions</li> <li>• be able to write balanced chemical and ionic equations for reactions in this learning aim</li> <li>• know the state symbols (s), (l), (g) and (aq), and use them in balanced equations</li> </ul>
Moles, molar masses and molarities.	<ul style="list-style-type: none"> <li>• know that 1 mole of any substance contains the same number of particles as there are atoms in 12.00g of carbon-12</li> <li>• that the number of particles in 1 mole is <math>6.02 \times 10^{23}</math> (known as the Avogadro constant)</li> <li>• be able to convert moles into number of particles using the Avogadro constant (and the reverse)</li> <li>• know that the molar mass of a substance is the mass in grams of 1 mole of the substance (and is the same as the relative atomic mass or relative formula mass expressed in g mol<sup>-1</sup>)</li> <li>• know that the molarity is the number of moles of a substance dissolved in water to produce a volume of 1 dm<sup>3</sup> of a solution and has units of mol dm<sup>-3</sup></li> </ul>
Percentage yields.	<ul style="list-style-type: none"> <li>• be able to calculate percentage yield of a product from the actual yield (experimental mass) and the theoretical yield (predicted mass)</li> </ul>
Reacting quantities	<ul style="list-style-type: none"> <li>• be able to calculate quantities of masses for substances reacting or produced, using balanced chemical equations, moles and molar mass</li> <li>• be able to calculate quantities of concentration for reacting substances, using</li> </ul>
Understand covalent bonding:	<ul style="list-style-type: none"> <li>• be able to predict if a compound has covalent bonding from its name or formula</li> <li>• understand how the physical properties of covalent substances, such as melting and boiling point, solubility and electrical conductivity, are affected by their bonding and structure (to include simple molecular and giant covalent structures)</li> </ul>
the relationship between bond lengths and bond strengths in covalent bonds	<ul style="list-style-type: none"> <li>• understand that as the number of shared pairs of electrons between two atoms increases, the bond length decreases</li> <li>• understand that as the number of shared pairs of electrons between two atoms increases, the bond strength increases</li> </ul> <p>be able to represent covalent bonds in substances as 2D line diagrams</p>
the relationship between bond lengths and bond strengths in covalent bonds	<ul style="list-style-type: none"> <li>• understand that as the number of shared pairs of electrons between two atoms increases, the bond length decreases</li> <li>• understand that as the number of shared pairs of electrons between two atoms increases, the bond strength increases</li> <li>• be able to represent covalent bonds in substances as 2D line diagrams</li> </ul>

Unit	Topic Title
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Unit 1, A1	Structure and bonding: covalent bonding, ionic bonding, relative atomic mass, intermolecular forces, moles, molar mass, molarities.
Unit 1, A2	Production and use of substances in relation to properties: physical properties of elements, electron configuration, halogens, displacement reactions.

#### Revision Support:

- Revision guide and lesson materials in Files section of class teams
- GCSE Pod
- Seneca
- GCSE Video guides mapped to topic areas: <https://student.craigndave.org/aqa-gcse-videos>
- Revision sites: <https://www.computerscience.gcse.guru/> and <https://getrevising.co.uk/resources/level/gcse/subjects/computing>