| Edexcel Single Chemistry (1CI0) from 2016 Topic C1a&b | | | | |
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| **Topic** | **Student Checklist** | **R** | **A** | **G** |
| **Topic 1a – Key concepts in chemistry Edexcel Single Chemistry (1CI0) from 2016 Topic C1a&b** | Describe how the Dalton model of an atom has changed over time because of the discovery of subatomic particles | | | |
| | Describe the structure of an atom as a nucleus containing protons and neutrons, surrounded by electrons in shells | | | |
| | Recall the relative charge and relative mass of: a proton, a neutron and an electron | | | |
| | Explain why atoms contain equal numbers of protons and electrons | | | |
| | Describe the nucleus of an atom as very small compared to the overall size of the atom | | | |
| | Recall that most of the mass of an atom is concentrated in the nucleus | | | |
| | Recall the meaning of the term mass number of an atom | | | |
| | Describe atoms of a given element as having the same number of protons in the nucleus and that this number is unique | | | |
| | Describe what isotopes are | | | |
| | Calculate the numbers of protons, neutrons and electrons in atoms given the atomic number and mass number | | | |
| | Explain how the existence of isotopes results in relative atomic masses of some elements not being whole numbers | | | |
| | **HT ONLY: Calculate the relative atomic mass of an element from the relative masses and abundances of its isotopes** | | | |
| | Describe how Mendeleev arranged the elements known at that time, in a periodic table by using properties of these elements and their compounds | | | |
| | Describe how Mendeleev used his table to predict the existence and properties of some elements not discovered by then | | | |
| | Explain that Mendeleev thought he had arranged elements in order of increasing relative atomic mass but this was not always true | | | |
| | Explain the meaning of atomic number of an element in terms of position in the periodic table and number of protons in the nucleus | | | |
| | Describe how elements are arranged in the groups and periods of the periodic table | | | |
| | Identify elements as metals or non-metals according to their position in the periodic table, explaining this division in terms of atomic structure | | | |
| | Predict the electronic configurations of the first 20 elements in the periodic table as diagrams and in the form 2.8.1 etc | | | |
| | Explain how the electronic configuration of an element is related to its position in the periodic table | | | |
| | Explain how ionic bonds are formed to produce cations and anions, including the use of dot and cross diagrams | | | |
| | Recall that an ion is an atom or group of atoms with a positive or negative charge | | | |
| | Calculate the numbers of protons, neutrons and electrons in simple ions given the atomic number and mass number | | | |
| | Explain the formation of ions in ionic compounds from their atoms, limited to compounds of elements in groups 1, 2, 6 and 7 | | | |
| | Explain the use of the endings –ide and –ate in the names of compounds | | | |
| | Deduce the formulae of ionic compounds given the formulae of the constituent ions | | | |
| | Explain the structure of an ionic compound including a description of the lattice and electrostatic forces | | | |

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| **Topic 1b – Key concepts in chemistry** | Explain how a covalent bond is formed when a pair of electrons is shared between two atoms | | | |
| | Recall that covalent bonding results in the formation of molecules | | | |
| | Recall the typical size (order of magnitude) of atoms and small molecules | | | |
| | Explain the formation of simple molecular, covalent substances, using dot and cross diagrams, including: H, HCl, $H_20$, $CH_4$, $O_2$, $CO_2$ | | | |
| | Explain why elements and compounds can be classified as: ionic, simple molecular (covalent), giant covalent and metallic | | | |
| | Explain how the structure and bonding of substances results in different physical properties | | | |
| | Explain the properties of ionic compounds limited to: melting/boiling points, forces between ions and conductivity | | | |
| | Explain the properties of typical covalent, simple molecular compounds limited to: melting/boiling points, forces between ions and conductivity | | | |
| | Recall that graphite and diamond are different forms of carbon and that they are examples of giant covalent substances | | | |
| | Describe the structures of graphite and diamond | | | |
| | Explain, in terms of structure and bonding, why graphite and diamond have different uses | | | |
| | Explain the properties of fullerenes including $C_{60}$ and graphene in terms of their structures and bonding | | | |
| | Describe, using poly(ethene) as the example, that simple polymers consist of large molecules containing chains of carbon atoms | | | |
| | Explain the properties of metals, including malleability and the ability to conduct electricity | | | |
| | Describe the limitations of particular representations and models, to include dot & cross, ball & stick models & 2/3D | | | |
| | Describe the properties of most metals | | | |
| | Calculate relative formula mass given relative atomic masses | | | |
| | Calculate the formulae of simple compounds from reacting masses and understand that these are empirical formulae | | | |
| | Deduce: empirical formula of a compound from the formula of its molecule | | | |
| | Deduce: molecular formula of a compound from its empirical formula and its relative molecular mass | | | |
| | Describe an experiment to determine the empirical formula of a simple compound such as magnesium oxide | | | |
| | Explain the law of conservation of mass applied to: a closed system and a non-enclosed system | | | |
| | Calculate masses of reactants and products from balanced equations, given the mass of one substance | | | |
| | Calculate the concentration of solutions in g $dm^{-3}$ | | | |
| | **HT ONLY: Recall what one mole of particles of a substance is defined as** | | | |
| | **HT ONLY: Calculate the number of: moles of particles of a substance in a given mass of that substance and vice versa** | | | |
| | **HT ONLY: Calculate the number of: particles of a substance in a given number of moles of that substance and vice versa** | | | |
| | **HT ONLY: Calculate the number of: particles of a substance in a given mass of that substance and vice versa** | | | |
| | **HT ONLY: Explain why, in a reaction, the mass of product formed is controlled by the mass of the reactant which is not in excess** | | | |
| | **HT ONLY: Deduce the stoichiometry of a reaction from the masses of the reactants and products** | | | |