**C1 Fundamentals Learning Journey**

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| 1Shape | Simplest particle = **Atom**  **Same Atoms**, same **Atomic Number**, one capital letter in symbol = **Element**  **Different atoms chemically joined/bonded**, 2 or more capital letters, little number is the number of that atom present = **Compound.** Compounds have **different properties** to their constituent atoms.  **Mixture** = **not chemically joined**, separate using physical properties |
| 2&3  Shape | Know how to **balance equations**  Don’t change small numbers! Can only change large numbers in front.  Need the **same number of each atom** type **on either side of the equation.** |
| 4&5  Shape | Have methods and explanations for how the following **separation** methods work:  **Filtration** (**solubility**)  **Evaporation** (**boiling point**, solutions)  **Crystallisation** (**boiling point**, solutions to get big crystals)  **Paper chromatography** (differential **solubility**) |
| 6&7  Shape | Apply knowledge and practical skills to complete separation using Filtration, Evaporation and Crystallisation- **Required Practical**. |
| 8  Shape | Apply knowledge and practical skills to complete Paper Chromatography- **Required Practical.** |
| 9  Shape | **Distillation** is separation of solutions by boiling point.  **Fractional Distillation** is separation of many liquids using boiling point. Lowest boiling point **boil** first, rise up column and **condense**. |
| 10&11  Shape | Ideas of the structure of the atom have changed over time.  **Thompson** – **Plum Pudding model** , ball of + charge with negative charge embedded  **Rutherford** – **Alpha scattering experiment** disproved this.  **Bohr** adapted idea - central positive charged nucleus (mass of atom) and electrons orbiting.  Discovery of **proton**.  **Chadwick** discovery of **neutron**. |
| 12  Shape | Know atom is composed of central, dense **nucleus** with **electrons** (negative) orbiting in **shells**.  **Mass number** = protons (positive) + neutrons (no charge) in nucleus.  **Atomic number** = number of protons and determines which atom it is.  As atoms have no overall charge **protons = electrons**.  **Isotope** is the same atom (as has same number of protons) but is heavier as it has more neutrons (so mass number is different). |
| 13  Shape | **Relative atomic mass Ar** is the average mass of an atom taking relative abundance of isotopes into account.  Ar = sum of (isotope mass number X abundance)/sum of abundance of all isotopes.  This allows for accurate calculations accounting for Isotopes. |
| 14&15  Shape | There are rules to drawing the correct **Electronic Configuration** of atoms:  Period/row number= number of shells,  Group Number = number of outer shell electrons,  Fill shells inner first, working outwards **(2, 8, 8, 18)**. |
| 16  Shape | Know that the **Periodic Table** has changed over time.  It started by being grouped according to weight and properties so some elements were in wrong groups.  **Mendeleev** arranged in the same way but left **gaps** predicting the properties of the missing elements. He did switch some to arrange primarily by properties.  We now use **Atomic Number** which accounts for **isotopes** and means everything is in correct place with groups sharing similar properties. |
| 17  Shape | Know that **Metals** share common properties: **ductile, hard, conductors, malleable, sonorous, lustrous.**  Metal atoms form **positive ions** as it easier to **lose** a few than gain many **electrons**.  In metallic structure, metal atoms are held by a **sea of electrons** holding positive metal ions together.  **Non-metals** have the opposite properties. |
| 18&19  Shape | **Group 1- Alkali metals** form ions with a **+1** charge when they **lose an electron**. Get **more reactive down group.**  This trend is because it is **easier to lose electrons** as the atom gets bigger as there is increased **shielding** and electrons are **further** from the nucleus.  Alkali metals react with Oxygen readily – tarnishing quickly, they react with water to produce hydrogen gas, they react with Halogens to form salts.  **Groups 7** **Halogens- less reactive down group**, toxic, coloured vapours, form **-1 ions** when they **gain an electron,** show **displacement** reactions. Less reactive down the group because it is **harder to gain electrons** the further the outer shell is from the nucleus and the more shielded it is from the positive attraction of the nucleus. |
| 20  Shape | **Transition metals**- Typical metal properties. Structure is a sea of delocalised electrons.  Their ions have various charges as outer shell fills before lower shell is completely filled. Used in colour glazes and as catalysts. |
| 21  Shape | **Group 0 Noble gases- unreactive/inert** as they already have **full shells of electrons**.  Down group = increasing boiling point.  Position in table in relation to others can be used to predict boiling point. |
| 22  Shape | Consolidation and revision techniques – run though methods including concept mapping, flash cards, read-cover-recall… |
| 23 | Assessment based on GCSE criteria and grade boundaries. |