**Year 9 Chemical Science – Student Program 2017**

**Reference text abbreviations:**

**RB Rossmoyne Booklet – Interactions in Chemistry**

**FOS2 Fundamentals of Science Book 2**

**OX9 Oxford Science WA Curriculum Year 9**

**Intro Chem Introductory Chemistry. Study Guide (Yr 10) Lucarelli & Proctor**

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| **Week** | **Program Objectives** | **Text References** |
| 1  19th June  – 23rd June  Week 9  Term 2 | **Atomic Structure and the Periodic Table**   * describe and model the structure of atoms in terms of the nucleus, protons, neutrons and electrons * comparing the mass and charge of protons, neutrons and electrons * conventional representation of an atom (X , Z and A notation) * define isotopes of elements in terms of their atoms having more or fewer neutrons | **OX9 Ch 7.2 p138-139**  **OX9 Ch 7.3 p139-140**  **OX9 Ch 7.6 p144-145**  **RB Act 2 p 8**  **RB Act 3 p9-13** |
| 2,3  26th June – 30th June  Week 10  Term 2  17th July – 21st July  Week 1  Term 3 | * electron configuration of the first 20 elements in terms of 2 8 8 2 notation * relate electron configuration to valencies and the periodic table * recall the valency of these ions:  |  |  |  |  | | --- | --- | --- | --- | | H+ | Mg2+ | F- | O2- | | Na+ | Ca2+ | Cl- | S2- | | K+ | Cu2+ | Br- | CO32- | | Ag+ | Zn2+ | I- | SO42- | | NH4+ | Pb2+ | OH- |  | |  | Al3+ | NO3- |  |  * Explain that a positive ion (cation) is formed when a metal atom loses electrons whereas a negative ion (anion) is formed when a non-metal atom gains electrons * Use the valency of the ions listed above to write the chemical formula of ionic compounds including compounds with polyatomic ions * Name ionic compounds including compounds with polyatomic ions | **OX9 Ch 7.4 p140-141**  **OX9 Ch 7.5 p142-143**  **RB Act 4 p12**  **RB Act 6 p 19**  **RB Act 10 p27-28**  Clickview  « What atoms are made of.  Atoms and their electrons. |
| 4,5  17th July -3rd Aug  Week 2,3  Term 3 | **Radioactivity and Radiation**   * recall that isotopes have more or fewer neutrons * isotopes can release alpha, beta or gamma radiation * relative harm of the different types of radiation * relative penetrating power of the different kinds of radiation. * radioactive decay and half-life curves * using radioactive decay - carbon-14 dating   **The History of the models of the atom (SHE strand)**   * historical development of models of the structure of the atom   (This to be covered as an assignment)  Dalton’s Model of atom  Thomson’s Model of atom.  Rutherford’s model of the atom.  Bohr model of atom.  Revision  Mid Topic Test | **OX9 Ch 7.7 p146-147**  **OX9 Ch 7.8 p148-149**  Education Perfect  Isotopes, radiation.  **OX9 Ch 7.1 p134-135** |
| 6  7th August – 11th August  Week 4  Term 3  7  14th August – 18th August  Week 5  Term 3 | **Balancing Chemical Equations**   * State the law of conservation of mass – Atoms are neither created nor destroyed during a chemical reaction, they only change the way in which they are arranged. * Identify reactants and products in a chemical equation. * Describing observed reactions using word equations * Interpret models of chemical reactions in terms of rearrangement of atoms * Balancing simple equations given the correct formulae.   **Energy in Chemical Reactions**   * Energy changes in chemical reactions – endothermic and exothermic reactions. | **OX9 Ch 8.1 p156-157**  **OX9 Ch 8.2 p158-159**  **OX9 Ch 8.3 p160-161**  **RB Act 24 Page 59**  **Intro Chem (Luc,Pro)**  **P30-33**  **OX9 Exp 8.3 p224** |
| **Properties of Acids and Bases**   * List properties of acids- sour taste, turns blue litmus paper red, pH below 7 * Name and state the formula of the following common acids- sulphuric acid (H2SO4), ethanoic acid (CH3COOH), hydrochloric acid (HCl) and nitric acid (HNO3). * List properties of bases- bitter taste, turns red litmus paper blue, pH above 7 * State the typical uses of common acids and bases * Use the pH scale to describe the acidity of a solution   **Indicators**   * Explain the function of an indicator * Use indicators to describe the acidity of a solution | **OX9 Ch 8.4 p162-163**  **RB Act 15 p42-43**  **RB Act 16 p44-45**  **RB Act 17 p46-47** |
| 8  21st August – 25th August  Week 6  Term 3 | **Chemical Reactions Involving Acids**   * Define neutralisation as a reaction between an acid and a base * Reaction of acids with reactive metals to produce hydrogen and a salt * Reactions of acids with carbonates and hydrogencarbonates * Write the formula for the products of the reactions above. * Investigation. | **OX Ch 8.5 p164-165**  **OX Ch 8.6 p166-167**  **Education Perfect**  **Acids,Bases, Reactions of Acids & Bases.**  **RB Act 21 p53-54**  **RB Act 22 p55-56**  **RB Act 23 p57-58**  **OX9 Exp 8.6 p227** |
| 9  28th Aug– 1st Sept  Week 7  Term 3 | **Chemical Reactions Involving Oxygen**   * Reactions of oxygen with metals * Reactions of oxygen with non-metals * Combustion reactions of hydrocarbons * Balancing equations of combustion of hydrocarbons# * (#Rudimentary balancing only,can extend better students,but in tests the students will only need to balance equations that have the correct formulae supplied in the question) | **OX Ch 8.7 p168-169**  **OX Ch 8.8 p170-171**  **OX9 Exp 8.7 p228**  **OX9 Exp 8.8 p228** |
| 10  21st Aug – 25th Aug  Week 8  Term 3 | **Fuels (SHE Strand)**   * Fuels from the combustion of hydrocarbons * Alcohols and Biofuels   Revision  End of Topic test – Thursday 7 September 2017 | **OX Ch 8.9 p168-169** |

**Assessment Structure**

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| **Assessment** | **When** | **Year Weighting (%)** |
| History of Atomic Models Timeline | Week 3 | 5 |
| Mid Topic | TBC | 5 |
| Investigation (TBC) | TBC | 5 |
| End of Topic Test | Friday 7 September | 10 |