**Curriculum Overview for Science**

**Year 9**

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| **Half Term 1: Biology, Chemistry and Physics Big Ideas**  **Substantive Knowledge:**  What classifies something as living; structure and organelles of simple plant/animal cells and bacterial cells; Functions of organelles; Differences between prokaryotes and eukaryotes; Hierarchical system of organisation; Structure of the digestive system and function; Structure of the respiratory system and function; How the respiratory and digestive system work together.; Structure and function of the reproductive systems  Definitions of element, atom, ions, compound, mixture, molecule and isotopes; Identify how early and modern periodic tables are organised; Interpret the periodic table; Structure of the atom; The charge and mass of subatomic particles.  Energy stores; Energy transfers; Useful and wasteful energy; Efficiency equation  Standard units and power of ten; variables; understand accuracy, precision, resolution, repeatability, reproducibility  **Disciplinary Knowledge:**  Practical use of microscopes  How to calculate subatomic particles  Draw atoms  Draw ions  Identify useful and wasteful energies  Calculate efficiency  Production and use of flash cards, revision cards and mind maps.  How to convert units  Drawing a table  How to calculate a mean | Books | Skim reading  Decoding – modelled  Etymology of key terms |
| Speech | Cell, prokaryotic, eukaryotic, organelle, plant, animal, bacteria, tissue, organ, organ system, organism, organ system, neurone, impulse, reproductive, Element, Atomic weight, Atomic proton number, Atom, Nucleus, Subatomic particle, Proton, Electron, Neutron, Isotope, Relative atomic mass, Shell, Ion, Energy, Store, Transfer, system, System, chain, Sankey diagram, Insulation, heating, Line of best fit, scale, control |
| Checklist RTL | Recall – one for each science |
| Home | Preparation of revision cards for every lesson  Memorising of revision cards for recall quiz – one for each science |
| **Half Term 2: Biology, Chemistry and Physics Big Ideas**  **Substantive Knowledge:**  Structure and function of the reproductive systems; The relationships between genes, chromosomes and DNA; Theory of evolution in the context of plants and animals  Definitions of element, atom, ions, compound, mixture, molecule and isotopes; Properties of mixtures; What reactants and products are  Contact and noncontact forces  understand what an anomaly is; understand what a line of best fit is; Non-linear, proportional, directly proportional graphs; understand what a trend is; understand what a gradient is  **Disciplinary Knowledge:**  How scientists work together to develop ideas.  How to calculate subatomic particles; Draw atoms; Draw ions  Drawing force diagrams; Calculating resultant forces; Writing methods; Plotting data; Scaling an axis; Drawing a line of best fit; Calculating a gradient | Books | Skim reading  Decoding – modelled  Etymology of key terms |
| Speech | Gamete, haploid, DNA, double helix, adaptation, evolution, mixture, compound, properties, effervescence, observation, reactants products, equation, Useful, wasteful, efficiency, Variables, efficiency, accurate, Work, energy, transfer, Power, work, method, Power, Force, Resultant force, Balanced and unbalanced force, terminal velocity |
| Checklist RTL | Review sheet – one for each science  End of unit assessment – one for each science |
| Home | Preparation of revision cards for every lesson  Review sheet – for each science  Revision for end of unit assessment – for each science |