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| **Long Term Plan** | | | In Y9 students will continue their journey in Science with the three sciences taught as separate disciplines, which provides the opportunity for students to start thinking like a Biologist, Chemist or Physicist rather than a ‘Scientist’. | | |
| **Learning Cycle** | **Key Concepts and Themes** | **Vocabulary** |
| **Year 9: Science** | **HT1** | | Electricity and Magnetism | * Charged objects and electric fields. * Circuits and current. * Potential difference, voltage and resistance in circuits. | Attract, Repel, Electric field, Current, Cell, Potential difference, Voltage, Resistance |
| Acids and Alkalis | * Understanding acids and alkalis. * The pH scale and neutralisation. * Making salts. | Acid, Alkali, Base, Indicator, The pH scale, Neutralisation, A salt |
| **HT2** | | Cells and their structure | * Structural differences between types of cells, including cell specialisation. * Microscopes and their use. * Culturing microorganisms. | Eukaryote, Prokaryote, Specialisation, Differentiation, Magnification, Aseptic techniques |
| Atomic Structure | * Atoms, elements and compounds * Atomic structure and electron configuration * Isotopes and relative atomic mass | Atom, Element, Compound, Mixture, Isotope, Chemical Formula, Proton, Electron, Neutron, Atomic Number, Mass Number |
| Energy Changes in a system | * Energy stores and systems * Changes in energy * Energy Changes in Systems | Energy, System, Joule, Transfer, Chemical, Kinetic, Gravitational Potential, Elastic, Thermal |
| **HT3** | | Cell division and transport in cells | * Mitosis. * Use of stem cells. * Transport of substances in and out of cells. | Mitosis, Chromosomes, Cytokinesis, Stem cells, Meristems, Diffusion, Osmosis, Active transport |
| The Periodic Table | * History of the Periodic Table and the modern Periodic Table * Group 1 alkali metals, Group 7 halogens and Group 0 Noble gases * Transition metals | Alkali metal, Trend, Halogen, Noble gas, Transition metal, property, boiling point, melting point, density, malleable, ductile, sonorous |
| Energy Changes in a system | * Specific Heat Capacity * Power | Thermal, Capacity, Power, Temperature, Mass, Rate of Change, |
| **HT4** | | Organisation | * Cells, tissues, organs, organ systems. * The role of Enzymes. | Enzyme, Active site, Catalyst, Denature, Optimum. |
| Structure and Bonding (Part 1) | * Ions and ionic bonding and properties * Metals and metallic bonding and properties * Non-metals and covalent bonding and properties | Ion, atom, ionic bonding, metallic bonding, covalent bonding, simple structure, giant structure, electrostatic force, intermolecular force |
| **HT5** | | Conservation and dissipation of Energy | * Energy transfers in a system * Thermal Insulation * Efficiency | Transfer, Wasted Energy, Insulation, Radiation, Conduction, Convection, Efficiency, Ratio |
| Organisation | * The human digestive system and the role of bile. * Food tests. * Adaptations of the small intestine. | Carbohydrase, Lipase, Protease, Emulsification, Surface area |
| **HT6** | | Structure and Bonding (Part 2 – materials) | * Diamond and graphite * Polymers and alloys. * Ceramic and composites * Nanoparticles | Giant structure, simple structure, intermolecular forces, alloy, polymer, matrix, nanoparticle |
| National and Global Energy Resources | * Renewable and non-renewable resources * The National Grid | Renewable, Non-Renewable, Resource, National Grid, Transformer, Dissipation |
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|  |  | **Skill Development** | | * To be able to plan an investigation to test a given hypothesis. * To be able to extrapolate data. * To be able to evaluate a scientific investigation and offer suggestions to improve the reliability and validity. | |