**Year 10 Science**

|  | **Topic** | **Key concept – what do I want the students to learn from this unit?** | **What knowledge will they acquire?** |
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| **YEAR 10 OVERVIEW** | | | |
| **Y10 - half term 1** | Infectious diseases (including plants) | Communicable diseases | * Communicable infectious diseases * Viral diseases * Bacterial diseases * Fungal diseases * Protist diseases * Human defences systems * Vaccinations * Antibiotics and painkillers * Discovery and development of drugs |
| Chemical Changes | Reactivity of metals.  Reactions of acids.  Electrolysis. | * Meta oxides * The reactivity series * Extraction of metals and reduction * Reactions of acids with metals * Neutralisation of acids and salt production * Soluble salts * The pH scale and neutralisation * The process of electrolysis * Electrolysis of molten ionic compounds * Using electrolysis to extract metals * Electrolysis of aqueous solutions |
| Particle mode of matter | Internal energy and energy transfers  Particle model and pressure | * Internal energy * Temperature change in a system and specific heat capacity * Changes of heat and specific latent heat * Particle model in gases |
| **Y10 – half term 2** | Respiration and Photosynthesis | Photosynthesis  Respiration | * Photosynthesis reaction * Rate of photosynthesis * Uses of glucose from photosynthesis * Aerobic and anaerobic respiration * Response to exercise * Metabolism |
| Energy Changes | Exothermic and endothermic reactions | * Energy transfer during Exothermic and Endothermic reactions * Reaction profiles |
| Atomic structure | Atoms and Isotopes | * The structure of an atom * Mass number, atomic number and isotopes * The development of the model of the atom * Atoms and nuclear radiation * Nuclear equations * Half-lives and the random nature of radioactive decay * Radioactive contamination |
| **Y10 – half term 3** | Homeostasis  And response | Homeostasis  The human nervous system  Human coordination in humans | * Human endocrine system * Control of blood glucose concentration |
| The rate and extent of chemical change | Rate of reactions.  Reversible reactions and dynamic equilibrium. | * Calculating rates of reaction. * Factors which affect the rates of chemical reactions. * Collision theory and activation energy * Catalysts * Reversible reactions * Energy changes and reversible reactions * Equilibrium |
| Forces | Forces and their interactions | * Scalar and vector quantities * Contact and non-contact forces * Gravity * Resultant forces * Work done and energy transfer * Forces and elasticity |
| **Y10 – half term 4** | Homeostasis | Reproductive hormones | * Hormones in human reproduction * Contraception |
| Organic Chemistry | Carbon compounds as fuels and feedstock. | * Crude oil, hydrocarbons and alkanes * Fractional distillation and petrochemicals * Properties of hydrocarbons * Cracking and alkanes * Structure and formula of alkenes * Reactions of alkenes * Alcohols * Carboxylic acids * Additional polymerisation * DNA and other naturally occurring polymers |
| Forces | Forces and motion  Forces, Accelerations and Newton’s Law of motion  Forces and breaking | * Describing a motion along a line * Speed * Velocity * The distance-time relationship * Acceleration * Newton’s First Law * Newton’s Second Law * Newton’s Third Law * Stopping distance * Reaction time * Factors affecting braking distance |
| **Y10 – half term 5** | Genetics | Reproduction | * Sexual and asexual reproduction * Meiosis * DNA and genome * Genetic inheritance * Inherited disorders * Sex discrimination |
| Chemical Analysis | Purity formulations and chromatography.  Identification of common gases. | * Pure substances * Formulations * Chromatography * Test for hydrogen * Test for oxygen * Test for carbon dioxide * Test for chlorine * Flame tests * Metal hydroxides * Carbonates * Halides * Sulfates * Instrumental methods * Flame emission spectroscopy |
| Waves | Waves in air , fluid and solids | * Transverse and longitudinal waves |
| **Y10 – half term 6** | Variety and Evolution | Variation and Evolution | * Variation * Evolution * Selective breeding * Genetic Engineering * Evidence of Evolution * Fossils * Extinction * Resistant bacteria * Classification of living organisms |
| Chemistry of the Atmosphere | The composition and evolution of the earth’s atmosphere.  Carbon Dioxide and methane as greenhouse gases.  Common atmospheric pollutants and their sources. | * The proportions of different gases in the atmosphere. * The Earth’s early atmosphere. * How oxygen increased * How carbon dioxide decreased * Greenhouse gases * Human activities which contribute to an increase in greenhouse gases in the atmosphere * Global climate change * The carbon footprint and its reduction * Atmospheric pollutants from fuels * Properties and effects of atmospheric pollutants |
| Waves | Waves in air , fluid and solids | * Properties of waves |