**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
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| Particle mode of matter | Internal energy and energy transfersParticle 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 | PhotosynthesisRespiration | * 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
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| **Y10 – half term 3** | HomeostasisAnd response | HomeostasisThe human nervous systemHuman 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 motionForces, 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
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| 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
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| Waves | Waves in air , fluid and solids | * Properties of waves
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