

Year 10 Science Overview

| Unit | Learning Objectives/Outcomes |
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| Organisation (Plants / enzymes) | <ul style="list-style-type: none"> • plant organisation • Human digestive system • Role of enzymes in digestion • Heart / circulatory system • Blood vessels • Composition of blood • Non communicable disease- coronary heart disease • Health issues • Effect of lifestyle on some no communicable diseases. • Cancer |
| Infection and response | <ul style="list-style-type: none"> • The importance of bacteria in the human digestive system. • Micro-organisms. • The process of anaerobic respiration in humans and micro-organisms, including fermentation, and a word summary for anaerobic respiration. • Infectious diseases • Viral, bacterial, fungal, protist disease • Human defence system • Vaccination / Antibiotics and painkillers • Antibodies (HIGHER) • Plant disease (BIOL ONLY) • Plant defence response |
| Bioenergetics | <ul style="list-style-type: none"> • The structure and functions of the gas exchange system in humans, including adaptation to function. • Plants making carbohydrates in their leaves by photosynthesis and gaining mineral nutrients and water from the soil via their roots. • The reactants in, and products of, photosynthesis, and a word summary for photosynthesis. • The role of leaf stomata in gas exchange in plants / adaptations of the leaf • The dependence of almost all life on Earth on the ability of photosynthetic organisms, such as plants and algae, to use sunlight in photosynthesis to build organic molecules that are an essential energy store and to maintain levels of oxygen and carbon dioxide in the atmosphere. • Aerobic and anaerobic respiration • Response to exercise • Metabolism |
| Homeostasis | <ul style="list-style-type: none"> • Regulation of the internal conditions of a cell or organism. • Automatic control systems |

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| Inheritance | <ul style="list-style-type: none"> • Reproduction – sexual and asexual • Advantages and disadvantages of sexual and asexual reproduction • DNA • Structure of DNA • Protein synthesis • Genetic inheritance • Inherited disorders • Sex determination • Mendel and genetics |
| Bonding and structures | <ul style="list-style-type: none"> • Properties of diamond, graphite, silicon dioxide and graphene • Properties of metals and alloys • Properties of polymers |
| Quantitative chemistry | <ul style="list-style-type: none"> • Reactivity of metals • Oxidation and reduction • Oxidation and reduction in terms of electrons (HIGHER) • Reactivity series • Displacement • Extracting metals |
| Chemical changes- metals and reactions, acids, bases and salts | <ul style="list-style-type: none"> • pH scale, neutralisation • reactions of acids with metals, bases, alkalis • Salt formation • Soluble salts • Neutralisation equation • Titrations • Strong and weak acids |
| Electrolysis / energy changes | <ul style="list-style-type: none"> • Electrolysis theory • Electrolysis of molten ionic compounds • Half equations • Electrolysis of aqueous substances • Electrolysis to extract aluminium • Exothermic and endothermic reaction theory • Uses of exothermic/endothermic reactions • Reaction profiles • Calculating energy changes (HIGHER) • Chemical cells and fuel cells |

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| Rates of reactions | <ul style="list-style-type: none"> • Relative mass • Conservation of mass • Moles (HIGHER) • Reacting masses (HIGHER) • Limiting reactants (HIGHER) • Concentration • Percentage yield and atom economy • Titration calculations • Gas volumes |
| Organic chemistry | <ul style="list-style-type: none"> • Fractional distillation • Cracking • Hydrocarbons and properties • Alkanes and alkenes • Reactions of alkenes • Alcohols (HIGHER) • Carboxylic acids (HIGHER) • Addition polymerisation, condensation polymerisation • Amino acids |
| Electricity | <ul style="list-style-type: none"> • Standard circuit symbols • Electric current • Calculating charge flow • Relationship between current, voltage and resistance • Potential difference • Resistors, Thermistors and LDRs • Series and parallel circuits • Alternating current and direct current • Mains electricity • Plugs • Energy transfers and power • Energy transfers in appliances • National grid • Static electricity (Physics) • Electric fields (Physics) |
| Particle model | <ul style="list-style-type: none"> • Solids, liquids, gases • Changes of state |
| Atomic structure | <ul style="list-style-type: none"> • Atoms, elements, compounds, mixtures • The development of the atom • Relative electrical charges of subatomic particles • Size and mass of atoms • Relative atomic mass • Electron structure |

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| Forces | <ul style="list-style-type: none"> • Scalar and vector quantities • Contact and non-contact forces • Gravity • Resultant forces • Work done and energy transfers • Forces and elasticity • Moments, lever and gears (Physics only) • Pressure and pressure differences in fluids |
| Forces and motion | <ul style="list-style-type: none"> • Describing motion along a line • Speed • Velocity • Distance time relationship • Acceleration • Newton's first law • Newton's second law • Newton's third law • Stopping distances • Reaction times • Braking distances |
| Waves | <ul style="list-style-type: none"> • Transverse and longitudinal waves • Wave diagrams • Calculating wave frequency • Wave speed • Measuring speed of waves • Reflection of waves and ray diagrams (Physics) • Sound waves (Physics) • Hearing • Ultrasound and uses (Physics) • Electromagnetic waves and spectrum • Refraction • Properties of EM waves • Uses of EM waves • Lenses (Physics) • Convex and concave lenses (Physics) • Lenses and ray diagrams (Physics) • Magnification (Physics) • Colours and filters • Emission and absorption of infrared radiation • Radiation and temperature |