

Fourth Form Chemistry (Combined Science) 2023/24

Michaelmas	Lent	Summer
<p>Chemical Changes</p> <p><u>Reactivity of metals</u></p> <ul style="list-style-type: none"> • Metal oxides • The reactivity series • Extraction of metals and reduction • Oxidation and reduction in terms of electrons (HT) <p><u>Reactions of acids</u></p> <ul style="list-style-type: none"> • Reactions of acids with metals • Neutralisation of acids and salt production • Soluble salts • The pH scale and neutralisation • Strong and weak acids (HT) <p><u>Electrolysis</u></p> <ul style="list-style-type: none"> • The process of electrolysis • Electrolysis of molten ionic compounds • Using electrolysis to extract metals • Electrolysis of aqueous solutions • Representation of reactions at electrodes as half equations (HT) 	<p>Energy Changes</p> <p><u>Exothermic and Endothermic reactions</u></p> <ul style="list-style-type: none"> • Energy transfer during exothermic and endothermic reactions • Reaction profiles • The energy change reactions (HT) <p>Rate of extent of Chemical change</p> <p><u>Rate of reactions</u></p> <ul style="list-style-type: none"> • Energy transfer during exothermic and endothermic reactions • Reaction profiles • The energy change reactions (HT) <p><u>Reversible reactions and dynamic equilibrium</u></p> <ul style="list-style-type: none"> • Energy changes and reversible reactions • Equilibrium • The effect of changing conditions on Equilibrium (HT) • The effect of changing concentration (HT) • The effect of temperature on equilibrium (HT) • The effect of pressure changes on equilibrium (HT) 	<p>Organic Chemistry</p> <p><u>Carbon compounds as fuel and feedstock</u></p> <ul style="list-style-type: none"> • Crude oil, hydrocarbons and alkanes • Fractional distillation and petrochemicals • Properties of hydrocarbons • Cracking and alkenes <p>Chemical Analysis</p> <p><u>Purity, formulation and chromatography</u></p> <ul style="list-style-type: none"> • Pure substances • Formulations • Chromatography <p><u>Identification of common gases</u></p> <ul style="list-style-type: none"> • Test for hydrogen • Test for oxygen • Test for carbon dioxide • Test for chlorine

Fourth Form Biology (Combined Science) 2023/24

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<p><u>Organisation</u></p> <p><u>Animal tissue, organs and organ systems</u></p> <ul style="list-style-type: none"> • The heart and blood vessels • Blood • Coronary heart disease: a non-communicable disease • The effect of lifestyle on some non-communicable diseases • Cancer <p><u>Plant tissue, organs and organ systems</u></p> <ul style="list-style-type: none"> • Plant tissues • Plant organ system 	<p><u>Infection and response</u></p> <p><u>Communicable diseases</u></p> <ul style="list-style-type: none"> • Communicable (infectious) disease • Viral diseases • Bacterial diseases • Fungal diseases • Protist diseases • Human defence systems • Vaccination • Antibiotics and painkillers • Discovery and development of drugs 	<p><u>Bioenergetics</u></p> <p><u>Photosynthesis</u></p> <ul style="list-style-type: none"> • Photosynthetic reaction • Rate of photosynthesis • Uses of glucose from photosynthesis <p><u>Respiration</u></p> <ul style="list-style-type: none"> • Aerobic and Anaerobic respiration • Response to exercise • Metabolism <p><u>Homeostasis and response</u></p> <p><u>Homeostasis</u></p> <ul style="list-style-type: none"> • Homeostasis <p><u>Human Nervous System</u></p> <ul style="list-style-type: none"> • Structure and function ('The human Nervous system' for combined) <p><u>Hormonal Coordination in humans</u></p> <ul style="list-style-type: none"> • Human Endocrine system • Control of blood glucose concentration • Hormones in human reproduction • Contraception • The use of hormones to treat infertility (HT) • Negative feedback (HT)

Fourth Form Physics (Combined Science) 2023/24

Michaelmas	Lent	Summer
<p><u>Energy</u></p> <p><u>National and global energy resources</u></p> <ul style="list-style-type: none"> National and global energy resources <p><u>Electricity</u></p> <p><u>Current, Potential Difference and resistance</u></p> <ul style="list-style-type: none"> Standard circuit diagram symbols Electrical charge and current Current, resistance and potential difference <p><u>Series and Parallel circuits</u></p> <ul style="list-style-type: none"> Resistors Series and parallel circuits <p><u>Domestic uses and safety</u></p> <ul style="list-style-type: none"> Direct and alternating potential difference Mains electricity 	<p><u>Electricity (continued)</u></p> <p><u>Energy Transfers</u></p> <ul style="list-style-type: none"> Power Energy transfers in everyday appliances The National Grid <p><u>Particle model of matter</u></p> <p><u>Changes of state and particle model</u></p> <ul style="list-style-type: none"> Density of materials Changes of state <p><u>Internal energy and energy transfers</u></p> <ul style="list-style-type: none"> Internal energy Temperature changes in a system and specific heat capacity Changes of heat and specific latent heat <p><u>Particle model and pressure</u></p> <ul style="list-style-type: none"> Particle motion in gases 	<p><u>Atomic Structure</u></p> <p><u>Atoms and isotopes</u></p> <ul style="list-style-type: none"> The structure of an atom Mass number, atomic number and isotopes The development of the model of the atom <p><u>Atoms and nuclear radiation</u></p> <ul style="list-style-type: none"> Radioactive decay and nuclear radiation Nuclear equations Half-lives and the random nature of radioactive decay Radioactive contamination <p><u>Forces</u></p> <p><u>Forces and their interactions</u></p> <ul style="list-style-type: none"> Scalar and vector quantities Contact and non-contact forces Gravity Resultant forces