Year 10-11 Separate Science Curriculum Map

and

Skills Descriptors

Science

Practical Skills

Mathematical application

Literacy

Apparatus

Scientific Techniques

Science Capital

Year/Term	Unit of Work	CORE KNOWLEDGE	Link to KS3	KEY SKILLS
10 Autumn Biology	4. 1 Cell Biology recap	· Basic cell recap and mitosis · Binary fission and culturing microorganisms · RP 1- Microscopy · RP 2- Effects of antibiotics on bacteria (can be covered with infection and response)		Practical Skills Mathematical application Literacy Apparatus Scientific Techniques Science Capital
10 Autumn Biology	4. 1 Cell Biology (Transport)	· Diffusion · Osmosis and RP 3 (Osmosis) · Active transport		Practical Skills Mathematical application Literacy Apparatus Scientific Techniques Science Capital
10 Autumn Biology	4.3 Infection and response	● Communicable diseases ● Viral/bacteria/fungi/protist disease ● Preventing disease and non-specific defence (skin, nose, trachea, stomach) ● White blood cells and immune response ● Vaccinations ● Antibiotics and painkillers ● Drug development ● HT Monoclonal antibodies: production and uses ● Plant diseases		Practical Skills Mathematical application Literacy Apparatus Scientific Techniques Science Capital
10 Autumn Biology	4.4 Bioenergetics	● Photosynthesis ● Rate of photosynthesis and limiting factors (HT inverse square law of light) RP 6 ● Uses of glucose ● Respiration- Aerobic and anaerobic ● Response to exercise ● Metabolism		Practical Skills Mathematical application Literacy Apparatus Scientific Techniques Science Capital
10 Autumn Physics	4.2 Electricity	· Current and circuit symbols. · Charge and current (Q=It) · Current, resistance and potential difference (V=IR) (RP 3) · Resistors (RP4) · Series circuits · Parallel circuits · Domestic electricity · Power ($P=VI$, $P=I^2R$) · Energy transfers ($E=Pt$, $E=QV$) · National grid · Static charge · Electric fields		Practical Skills Mathematical application Literacy Apparatus Scientific Techniques Science Capital
ASSESSMENT 1:				

10 Autumn Chemistry	4.4 Chemical changes	· Metal oxides · Reactivity series · Extraction of metals/reduction (HT REDOX and ionic equations) · Acids and bases and the pH scale · Strong and weak acids · Reactions of acids · Neutralisation · Making soluble salts (RP 1) · Neutralisation and titrations (RP 2) · Electrolysis · Electrolysis and extracting metals · Electrolysis and aqueous solutions (RP 3) (HT half equations)		Practical Skills Mathematical application Literacy Apparatus Scientific Techniques Science Capital
10 Autumn Physics	4.3 Particle model of matter	· Density (p=m/V) (RP 5) · States of matter and changes of state· Internal energy · Specific heat capacity · Specific latent heat · Particle motion in gases · Pressure in gases and increasing pressure		Practical Skills Mathematical application Literacy Apparatus Scientific Techniques Science Capital
10 Autumn Chemistry	4.4 Atomic structure	● Atomic structure, mass number and atomic number. ● Isotopes ● Development of the atom (plum pudding etc) ● Radiation and typed of decay Nuclear equations● Half-life and random decay ● Radioactive contamination ● Background radiation ● Different half-lives of radioactive isotopes ● Uses of nuclear radiation ● Nuclear fission ● Nuclear fusion		Practical Skills Mathematical application Literacy Apparatus Scientific Techniques Science Capital
ASSESSMENT 2:				
10 Spring Physics	4.5 Energy changes	· Energy changes and examples (RP4) · Reaction profiles (HT Energy change of reactions) ● HT Energy change of reactions ● Cells and batteries ● Fuel cells		Practical Skills Mathematical application Literacy Apparatus Scientific Techniques Science Capital
10 Spring term	Exam practice	Exam question practice Skills focus: 6 marker questions Data questions Calculation/equation questions		Practical Skills Mathematical application Literacy Apparatus Scientific Techniques Science Capital

10 Spring Chemistry	4.6 Rate and extent of change (rate of reactions)	· Rate of reactions · Factors affecting rate of reactions · Concentration and rate of reaction (RP5) · Measuring rate of reactions · Activation energy and catalysts · Reversible reactions · Le Chatelier's Principle · Factors affecting equilibrium		Practical Skills Mathematical application Literacy Apparatus Scientific Techniques Science Capital
10 Spring Chemistry	4.5 Forces	· Scalar and vectors · Contact and non-contact forces · Weight/mass/gravity Resultant forces and work done · Calculating forces · Elasticity · Investigating springs (RP 6) · Moments levers and gears		Practical Skills Mathematical application Literacy Apparatus Scientific Techniques Science Capital
10 Spring Exam techniques	Exam techniques	Walking/talking mocks Required practical time (any missed in paper 1 from previous year)		Practical Skills Mathematical application Literacy Apparatus Scientific Techniques Science Capital
ASSESSMET 3:				
10 Spring Physics	6.5 Forces	· Scalar and vectors · Contact and non-contact forces · Weight/mass/gravity Resultant forces and work done · Calculating forces · Elasticity · Investigating springs (RP 18) · Distance and displacement · Acceleration · Investigating acceleration (RP19) · Distance/time and vel/time		Practical Skills Mathematical application Literacy Apparatus Scientific Techniques Science Capital
10 Spring Chemistry	5.6 Rate and extent of change (rate of reactions)	5.6 Rate and extent of change (rate of reactions) · Rate of reactions · Factors affecting rate of reactions · Concentration and rate of reaction (RP11) · Measuring rate of reactions· Activation energy and catalysts · Reversible reactions · Le Chatelier's Principle · Factors affecting equilibrium		Practical Skills Mathematical application Literacy Apparatus Scientific Techniques Science Capital
ASSESSMENT 4:				

10 Summer Physics	6.5 Forces	· Pressure in fluids · Atmospheric pressure · Distance and displacement · Acceleration · Investigating acceleration (RP 7) · Distance/time and vel/time · Terminal Velocity · Newton's first and second laws · Inertia · Newton's third law and breaking distance · Momentum (HT) · Changes in momentum and calculations		Practical Skills Mathematical application Literacy Apparatus Scientific Techniques Science Capital
10 Summer Chemistry	4.7 Organic Chemistry	· Hydrocarbons · Fractional distillation and Crude oil · Uses and cracking of crude oil · Structure and reactions of alkenes· Alcohols and Carboxylic acids · Addition polymerisation· Condensation polymerisation · Amino acids · DNA and naturally occurring polymers		Practical Skills Mathematical application Apparatus Scientific Techniques Science Capital
10 Summer Chemistry	4.8 Chemical analysis	· Purity and formulations · Paper chromatography · Chromatography experiment (RP6) · Test for gases		Practical Skills Mathematical application Literacy Apparatus Scientific Techniques Science Capital
ASSESSMENT 5:				
10 Summer Biology	4.5 Homeostasis and response	· Homeostasis · Central Nervous system · The brain · The eye · Reaction time (RP7) · Temperature control· Endocrine system · Blood glucose · Water and nitrogen · Hormones in human reproduction · Contraception · Hormones and infertility · Negative feedback		Practical Skills Mathematical application Literacy Apparatus Scientific Techniques Science Capital
10 Summer Chemistry	4.8 Chemical analysis	· Flame tests · Metal hydroxides · Carbonates · Halides · Sulphates · Identifying ions (RP7) · Instrumental methods · Flame emission spectroscopy		Practical Skills Mathematical application Literacy Apparatus Scientific Techniques Science Capital

10 Summer Physics	4.6 Waves	· Wave and wave properties · RP8 Ripple tank · Reflection and RP9 · Sound waves · Detection and exploration · Electromagnetic waves· Properties and uses of EM waves		Practical Skills Mathematical application Literacy Apparatus Scientific Techniques Science Capital
ASSESSMENT 6 END OF YEAR ASSESSMENT:				

Year/Term	Unit of Work	CORE KNOWLEDGE	Link to KS2	KEY SKILLS
11 Autumn Biology	4.6 Inheritance	· Sexual and asexual reproduction · Adv and disadv of sexual and asexual · Meiosis · DNA, DNA structure and genome · Genetic inheritance and punnet squares incl. sex determination · Polydactyly and cystic fibrosis and embryonic screening · Variation· Selective breeding ·		Practical Skills Mathematical application Literacy Apparatus Scientific Techniques

		Genetic engineering · Cloning · Theory of evolution (Darwin vs Lamark) and natural selection and evidence · Speciation · Understanding genetics · Fossils and extinction · Resistant bacteria · Classification		Science Capital
11 Autumn Physics	4.5 Forces	(finishing off from last year if incomplete) · Distance and displacement · Acceleration · Investigating acceleration (RP7) Distance/time and vel/time · Terminal Velocity · Newton's first and second laws · Inertia · Newton's third law and breaking distance · Momentum and changes in momentum(HT)		Practical Skills Mathematical application Literacy Apparatus Scientific Techniques Science Capital
11 Autumn Chemistry	4.9 Chemistry of the atmosphere	· Composition of current atmosphere · Earth's early atmosphere · How O2 and CO2 increased · Greenhouse gases and human activity · Climate change and carbon footprint · Atmospheric pollutants		Practical Skills Mathematical application Literacy Apparatus Scientific Techniques Science Capital
11 Autumn Chemistry	4.10 Using resources	· Earth's resources · Potable water · RP8 Purification of water · Waste water treatment · Phytomining and bioleaching (HT) · Life cycle assessments· Corrosion and its prevention · Useful alloys · Ceramics, polymers and composites · Haber process · NPK fertilisers		Practical Skills Mathematical application Literacy Apparatus Scientific Techniques Science Capital
11 Autumn Physics	4.6 Waves	· Wave and wave properties · RP8 Ripple tank · Reflection and RP9 · Sound waves · Detection and exploration · Electromagnetic waves· Ray diagrams and wave front diagrams on refraction (HT) · RP 10 Infrared absorption · Properties and uses of EM waves · Lenses · Visible light · Black body radiation		Practical Skills Mathematical application Literacy Apparatus Scientific Techniques Science Capital
11 Autumn Physics	6.7 Magnetism and electromagnetism	4.7 Magnetism and electromagnetism · Permanent magnets · Magnetic fields · The motor effect and electromagnetism (Fleming's left hand rule HT only) · Electric motors (HT) · Loudspeakers (HT) · Induced potential · Transformers · National grid		Practical Skills Mathematical application Literacy Apparatus Scientific Techniques

				Science Capital
11 Autumn Biology	4.7 Ecology	· Communities · Abiotic and biotic factors · Adaptations · Levels of organisation · RP 9 Sampling · Carbon cycle · Water cycle		Practical Skills Mathematical application Literacy Apparatus Scientific Techniques Science Capital
ASSESSMENT 1:				
11 Autumn Physics	4.8 Space Physics	· Solar system · Life cycle of a star · Orbital motion and natural/artificial satellites · Red shift		Practical Skills Mathematical application Literacy Apparatus Scientific Techniques Science Capital
11 Autumn Biology	4.7 Ecology	· Decomposition · RP 10 Effect of temp on milk decay · Impact of environmental change · Biodiversity · Waste management and land use · Deforestation and global warming · Maintaining biodiversity · Trophic levels · Food production		Practical Skills Mathematical application Literacy Apparatus Scientific Techniques Science Capital
11 Autumn term	Exam preparation	Finish off any paper 2 topics Required practical activity catch up/revision		Practical Skills Mathematical application Literacy Apparatus Scientific Techniques Science Capital
ASSESSMENT 2:				
11 Spring term	Paper 1 revision	Revision paper 1 Biology Revision paper 1 Chemistry		Practical Skills Mathematical application

		Revision paper 1 Physics		Literacy Apparatus Scientific Techniques Science Capital
ASSESSMENT 3:				
11 Spring term	Required practical revision	Required practical focused revision Walking/talking mocks		Practical Skills Mathematical application Literacy Apparatus Scientific Techniques Science Capital
ASSESSMENT 4:				
11 Summer Biology	Feedback	Feedback		Practical Skills Mathematical application Literacy Apparatus Scientific Techniques Science Capital
ASSESSMENT 5:				
11 Summer Biology	Exam preparation	Walking/talking mock		Practical Skills Mathematical application Literacy Apparatus Scientific Techniques Science Capital