

Curriculum Overview KS4- Science

Year 10	Biology (SS = separate science only)	Chemistry (SS = separate science only)	Physics (SS = separate science only)
Autumn	Unit 3 Genetics - Sexual and asexual reproduction (SS) - Meiosis - DNA - DNA replication (SS) - Protein synthesis (SS) - Mendel (SS) - Alleles - Inheritance - Multiple and missing alleles (SS) - Gene mutation - Variation Unit 4 Natural Selection and genetic modification - Evidence of human evolution - Darwin's theory - Development of Darwin's theory (SS) - Classification - Breeds and varieties	Unit 5-7 Bonding (ionic, covalent and metallic) and types of substance - Ionic bonding - Ionic lattices - Properties of ionic compounds - Covalent bonds - Molecular compounds - Allotropes of carbon - Metallic bonding – properties of metals - Bonding models Unit 8 Acids and Alkalis - Acids, alkalis and indicators - Looking at acids - Bases and salts - Preparing copper sulfate - Alkalis and balancing equations - Investigating neutralisation - Alkalis and neutralisation - Reactions of acids with metals and with metals and carbonates - Solubility Unit 9 Calculations Involving Mass - Masses and empirical formulae - Conservation of mass - Moles	Unit 3 Conservation of energy - Energy stores and transfers - Energy efficiency - Keeping warm – insulation - Stored energies – kinetic and gravitational potential energy - Non-renewable energy - Renewable resources Unit 4 Waves - Describing waves - Wave speeds - Investigating waves - Refraction - Waves crossing boundaries (SS) - Ears and hearing (SS) - Ultrasound (SS) - Infrasound (SS) Unit 5 Light and the EM spectrum - Ray diagrams (SS) - Investigating refraction (SS) - Colour (SS) - Electromagnetic waves - The EM spectrum - Uses of long and short wavelengths - Electromagnetic radiation dangers
Spring	Unit 4 Natural Selection and genetic modification contd - Tissue culture (SS) - Genes in agriculture and medicine - GM and agriculture (SS) - Fertilisers and biological control (SS) Unit 5 Health, Disease and development of medicines - Health and disease - Non communicable diseases - Cardiovascular diseases - Pathogens - Spreading pathogens - Virus life cycles (SS) - Plant defences (SS) - Plant diseases (SS) - Physical and chemical barriers - The immune system - Antibiotics - Monoclonal antibodies (SS)	Unit 10 -13 electrolytic processes, obtaining and using metals, reactions and Transitions metals, Alloys and Corrosion - Electrolysis - Electrolysis of copper sulfate - Products form electrolysis - Reactivity - Ores - Oxidation and reduction - Lifecycle assessment and recycling - Dynamic equilibrium - Transition metals (SS) - Corrosion (SS) - Electroplating (SS) - Alloying (SS) - Uses of metals and their alloys (SS)	Unit 6 Radioactivity - Atomic structure and isotopes - Inside atoms - Electron orbits - Background radiation - Types of radiation - Radioactive decay - Half life - Using radioactivity - Dangers of radioactivity - Radioactivity in medicine - Nuclear energy - Nuclear fission and fusion (SS) - Nuclear reactors (SS) Topics 7 Astronomy (SS topic only) - The solar system - Gravity and orbits - Life cycle of a star - Red shift - Origins of the universe

Summer	Unit 6 plant structure and their function • Photosynthesis • Factors that affect photosynthesis • Absorbing water and minerals (SS) • Transpiration and translocation • Plant adaptations (SS) • Plant hormones (SS) • Uses of hormones (SS) Unit 7 Animal coordination, control and homeostasis • Hormones • Hormonal control • The menstrual cycle	Unit 14 -16 Quantitative analysis, dynamic equilibria, calculations involving volumes of gases, chemical cells and fuel cells (SS only topic) • Yields • Atom economy • Concentrations • Titrations and calculations • Molar volume of gases • Fertilisers and the Haber process • Factors affecting equilibrium • Chemical cells and fuel cells	Unit 8 Work and Power • Work and power • Objects affecting each other • Vector diagrams • Rotational forces (SS) Topic 14/15 Particle Model Forces and matter • Particles and density • Investigating densities • Energy and changes of state • Energy calculations • Gas temperature and pressure
---------------	--	---	---

Year 11	Biology	Chemistry	Physics
Autumn	Unit 9 Ecosystems and material cycles • Ecosystems • Energy transfer (SS) • Abiotic factors • Biotic factors • Assessing pollution (SS) • Parasitism and mutualism • Biodiversity and humans	Unit 17-19 Groups in the periodic table, Rates of reaction, heat energy changes in chemical reactions • Group 1 • Group 7 • Halogen reactivity • Group 0 • Rates of reaction • Factor affecting rates of reaction • Investigating reaction rates • Catalysts and activation energy • Exothermic and endothermic reactions • Energy changes in reactions	Unit 9/10 Electricity and static electricity • Electric circuits • Current and P.D • Current, charge and energy • Resistance • More resistance • Investigating resistance • Transferring energy • Power • Transferring energy by electricity • Electrical safety • Static electricity (SS) • Danger and uses of static electricity (SS) • Electric fields (SS)
Spring	Unit 9 Ecosystems and material cycles contd • Preserving biodiversity • Food security (SS) • The water cycle • The carbon cycle • The nitrogen cycle • Rates of decomposition (SS) Revision	Unit 20-21 Fuels & Earth and the atmosphere • Hydrocarbons and crude oil/natural gas • Fractional distillation • Alkane homologous series • Complete and incomplete combustion • Fuels and pollution • Breaking down hydrocarbons • The early atmosphere • The changing atmosphere • The atmosphere today • Climate change Unit 22-24 Hydrocarbons, Alcohols and carboxylic acids, Polymers (SS only topic) • Alkanes and alkenes • Reactions of alkanes and alkenes • Ethanol production • Alcohols • Carboxylic acids • Polymerisation • Polymer properties and uses • Condensation polymerisation • Problems with polymers	Unit 12/13 Magnetism and the motor effect, electromagnetic induction • Magnets and magnetic fields • Electromagnetism • Magnetic forces • Electromagnetic induction (SS) • The national grid • Transformers and energy Topic 14/15 Particle Model Forces and matter • Gas Pressure and volume (SS) • Bending and stretching • Extension and energy transfer • Pressure in fluids (SS) • Pressure and upthrust (SS)

Summer	Revision	Unit 25/26 Qualitative Analysis (SS only topic) • Flame tests • Tests for positive and negative ions • Choosing materials • Composite materials • Nanoparticles	Revision
--------	----------	---	----------