

Curriculum Overview – Science KS4

Year 10	Biology	Chemistry	Physics
Autumn	Recap of unit 1&2 Unit 3 Genetics - Sexual and asexual reproduction - Meiosis - DNA - DNA replication - Protein synthesis - Mendel - Alleles - Inheritance - Multiple and missing alleles - Gene mutation - Variation Unit 4 Natural Selection and genetic Modification - Evidence of human evolution - Darwin's theory - Development of Darwin's theory - Classification - Breeds and varieties	Recap of unit 1-4 Unit 5-7 Types of substance - Ionic bonding - Ionic lattices - Properties of ionic compounds - Covalent bonds - Types of substance - Molecular compounds - Allotropes of carbon - Metallic bonding - Bonding models	Recap of unit 1-4 Topic 5 Light and the EM spectrum - Colour (Separate science only) - The EM spectrum - Uses of long and short wavelengths - Lenses (SS) - Dangers of long and short wavelengths
Spring	Unit 4 Natural Selection and genetic Modification - Tissue culture - Genes in agriculture and medicine - GM and agriculture - Fertilisers and biological control Unit 5 Health, Disease and development of medicines Health and disease	Unit 10 – 13 electrolytic processes, obtaining and using metals, reactions and Transitions metals, Alloys and Corrosion - Electrolysis - Reactivity - Ores - Oxidation and reduction - Dynamic equilibrium - Transition metals - Corrosion - Electroplating - Alloying - Uses of metals	Topic 6 Radioactivity - Atomic structure and isotopes - Background radiation - Alpha beta gamma radiation - Alpha beta gamma decay - Half life - Nuclear fission and fusion(SS)

	• Non communicable diseases • Cardiovascular diseases • Pathogens • Spreading pathogens • Viruses life cycles • Plant defences • Plant diseases • Physical and chemical barriers • The immune system • Antibiotics • Monoclonal antibodies		• Nuclear reactor(SS) Topics 7 Astronomy (SS) • The solar system • Gravity and orbits • Life cycle of a star • Red shift • Origins of the universe
Summer		Unit 9 Calculations Involving Mass • Masses and empirical formulae • Conservation of mass • Moles	Unit 8 Work and Power • Work and power • Objects affecting each other • Vector diagrams • Rotational forces •

Year 11	Biology	Chemistry	Physics
Autumn	Unit 6 plant structure and their function • Photosynthesis • Factors that affecting photosynthesis • Absorbing water and minerals • Transpiration and translocation • Plant adaptations • Plant hormones • Uses of hormones	Unit 17-19 Groups in the periodic table, Rates of reaction, heat energy changes in chemical reactions • Group 1 • Group 7 • Halogens • Rates of reaction • Factor affecting rates of reaction • Catalysts and activation energy • Exothermic and endothermic reactions	Topic 14/15 Particle Model Forces and matter • Particles and density • Energy and changes of state • Energy calculations Gas temperature Unit 9/10 Electricity and static electricity • Electric circuits • Current and P.D • Current, charge and energy

	Unit 7 Animal coordination, control and homeostasis • Hormones • Hormonal control • The menstrual cycle	• Energy changes in reactions	• Resistance • Transferring energy • Power • Transferring energy by electricity • Static electricity # • Danger and uses of static electricity • Electric fields
Spring	Unit 7 Animal coordination, control and homeostasis • Control and blood glucose • Type 2 diabetes • Thermoregulation • Osmoregulation • The kidneys Topic 8 Exchange and transport in animals • Efficient transport and exchange • Factors affecting diffusion • The circulatory system • The heart - Cellular respiration Topic 9 Ecosystems and material cycles • Ecosystems • Energy transfer • Abiotic factors • Biotic factors • Assessing pollution • Parasitism and mutualism • Biodiversity and humans •	Unit 20-21 Fuels & Earth and the atmosphere • Hydrocarbons and crude oil • Fractional distillation • Alkane homologous series • Complete and incomplete combustion • Fuels and pollution • Breaking down hydrocarbons • The early atmosphere • The changing atmosphere • Climate change 22-24 Hydrocarbons, Alcohols and carboxylic acids, Polymers(separate) • Alkanes and alkenes • Reactions of alkanes and alkenes • Ethanol production • Alcohols • Carboxylic acids • Polymerisation • Polymer properties and uses • Condensation polymerisation • Problems with polymers	• Power • Transferring energy by electricity • Static electricity # • Danger and uses of static electricity • Electric fields Unit 12/13 Magnetism and the motor effect, electromagnetic induction • Magnets and magnetic fields • Electromagnetism • Magnetic forces • The national grid • Transformers and energy

Summer	Topic 9 Ecosystems and material cycles • Preserving biodiversity • Food security • The water cycle • The carbon cycle • The nitrogen cycle • Rates of decomposition Revision	Unit 14/15/16 Quantitative analysis, dynamic equilibria, calculations involving volumes of gases, chemical cells and fuel cells (separate only) • Yields • Atom economy • Concentrations • Titration • Molar volume of gases • Fertilisers and the Haber process • Factors affecting equilibrium chemical cells and fuel cells Unit 25/26 Qualitative Analysis (separate only) • Flame tests • Tests for positive and negative ions • Choosing materials • Composite materials • nanoparticles	Topic 14/15 Particle Model Forces and matter • Pressure and volume • Bending and stretching • Extension and energy transfer • Pressure in fluids • Pressure and upthrust
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