CAISTOR YARBOROUGH ACADEMY

Curriculum Overview – Key Stage 4 Science

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 • 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	**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) • 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 7 Animal coordination, control and homeostasis** • Hormones • Hormonal control • The menstrual cycle	**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 • Energy changes in reactions	**Unit 9/10 Electricity and static electricity** • Electric circuits • Current and P.D • Current, charge and energy • 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	**Unit 12/13 Magnetism and the motor effect, electromagnetic induction** • Magnets and magnetic fields • Electromagnetism • Magnetic forces • The national grid • Transformers and energy **Topic 14/15 Particle Model Forces and matter** • Particles and density • Energy and changes of state • Energy calculations • Gas temperature

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