KS5 Biology Curriculum Map

Big idea	Year 12	Year 13
Cells are alive	**Cell Structure** • Eukaryotic cell ultrastructure • Prokaryotic cells • Viruses • Microscopy (light vs electron) **Cell Membranes & Transport** • Fluid mosaic model • Diffusion • Osmosis • Active transport • Co-transport **Cell Division** • Mitosis & cell cycle • Stem cells	
Characteristics are inherited	**DNA & Replication** • DNA structure • Semi-conservative replication **Protein Synthesis** • Transcription • Translation • Genetic code **Genetic Diversity** • Mutation • Meiosis • Crossing over • Independent assortment • Random fertilisation	**Inheritance** • Monohybrid & dihybrid crosses • Codominance • Multiple alleles • Sex linkage • Chi-squared tests

Ecosystems cycle resources		**Photosynthesis** • Light-dependent reaction • Light-independent reaction **Respiration** • Glycolysis • Link reaction • Krebs cycle • Oxidative phosphorylation **Energy Transfer** • Trophic levels • Efficiency calculations **Nutrient Cycles** • Carbon cycle • Nitrogen cycle • Decomposition • Saprobionts • Factors affecting decay
Species show variation		**Genetics, populations, evolution and ecosystems** **Variation** • Genetic vs environmental • Continuous vs discontinuous • Population Genetics • Allele frequencies • Hardy–Weinberg **Natural Selection** • Selection pressures • Directional, stabilising, disruptive selection **Speciation** • Reproductive isolation • Allopatric vs sympatric **Classification** • Taxonomy

		• Phylogeny
Organisms are interdependent	**Biodiversity** • Levels of biodiversity • Measuring biodiversity (Simpson's index) **Human Impact** • Eutrophication • Pollution • Conservation	**Populations** • Population size • Carrying capacity • Sampling techniques • Communities • Predator–prey relationships • Competition
Bodies are systems	**Organisms exchange substances with their environment** **Exchange Surfaces** • SA:V ratio • Adaptations of exchange surfaces • Gas exchange (lungs, fish gills, insects) **Transport in Animals** • Heart structure • Cardiac cycle • Blood vessels • Haemoglobin • Tissue fluid formation **Transport in Plants** • Xylem structure & transpiration • Phloem & translocation **Immune System** • Phagocytosis • T cells & B cells • Antibodies • Vaccination	**Organisms respond to changes in their internal and external environments** **Homeostasis** • Negative feedback • Temperature regulation • Water potential (kidneys, ADH) • Endocrine system • Hormone action • Blood glucose control **Nervous Coordination** • Neurone structure • Action potentials • Synapses • Reflex arcs **Plant Responses** • Tropisms • Plant hormones • Stimuli and survival/response • Receptors