

Key Stage 5 Curriculum Overview

Subject: Biology

Year 12

Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2	Assessments
<p>Biological Molecules</p> <ul style="list-style-type: none"> • Carbohydrates and monosaccharides • Disaccharides and polysaccharides • Starch, glycogen and cellulose • Lipids • Proteins • Enzymes • Structure of RNA and DNA • DNA replication • Energy and ATP • Water and its functions <p>Cells</p> <ul style="list-style-type: none"> • Methods of studying cells • Electron microscope • Microscopic measurements and calculations • Eukaryotic cell structure • Cell specialisation and organisation • Prokaryotic cells and viruses • Mitosis • The cell cycle 	<p>Organisms exchange substances with their environment</p> <ul style="list-style-type: none"> • Gas exchange in single-celled organisms, insects, fish and the leaf • Limiting water loss • Human gas exchange system • Enzymes and digestion • Absorption of the products of digestion • Haemoglobin and the transport of oxygen • Circulatory system of a mammal • Structure of the heart • The cardiac cycle • Blood vessels and their functions • Transport in the xylem and the phloem 	<p>Genetic information, variation and relationships between organisms</p> <ul style="list-style-type: none"> • Genes and the triplet code • DNA and chromosomes • The structure of RNA • Protein synthesis – transcription, splicing and translation • Mutations • Meiosis and genetic variation • Genetic diversity and adaptation • Types of selection • Species and taxonomy • Diversity within a community • Species diversity and human activity • Quantitative investigations of variation 	<p>Cell recognition and immune response</p> <ul style="list-style-type: none"> • Defence mechanisms • Phagocytosis • T lymphocytes and cell mediated immunity • B lymphocytes and humoral immunity • Antibodies • Vaccination • HIV 	<p>Revision;</p> <p>Biological Molecules</p> <p>Cells</p> <p>Organisms exchange substances with their environment</p> <p>Genetic information, variation and relationships between organisms</p> <p>Cell recognition and immune response</p>	<p>Energy transfer in and between organisms</p> <ul style="list-style-type: none"> • Respiration: glycolysis, link reaction, Krebs cycle, oxidative phosphorylation and anaerobic respiration • Ecosystems: food chains, energy transfer, productivity, nutrient cycles, fertilisers • Photosynthesis: the light dependent reaction and the light independent reaction 	<p>Ongoing CPAC activities</p> <p>Bi-weekly assessments</p> <p>End of unit assessments</p> <p>PPQs homework</p>

<ul style="list-style-type: none">• Structure of the cell surface membrane• Diffusion, osmosis and active transport• Co-transport and absorption						
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<p>Organisms respond to changes in their environment</p> <ul style="list-style-type: none"> • Survival and response • Plant growth factors • Reflex arc • Receptors • Control of heart rate • Neurones and nervous coordination • Action potential • Nerve impulse • Synapse • Skeletal muscle • Homeostasis • Feedback mechanisms • Blood glucose regulation and diabetes • Osmoregulation 	<p>Genetics, populations, evolution, and ecosystems</p> <ul style="list-style-type: none"> • Monohybrid inheritance • Genetic crosses • Dihybrid inheritance • Codominance and multiple alleles • Sex-linkage • Autosomal linkage • Epistasis • Chi-squared test • Population genetics • Variation in phenotype • Natural selection • Evolution • Isolation and speciation • Competition • Predation • Succession • Conservation 	<p>The control of gene expression</p> <ul style="list-style-type: none"> • Stem cells and totipotency • Regulation of transcription and translation • Epigenetic control of gene expression • Cancer • Genome projects • DNA fragments • <i>In vivo</i> and <i>in vitro</i> cloning • Locating genes, genetic screening, and counselling • Genetic fingerprinting 	<p>Revision Year 12 content;</p> <p>Biological Molecules</p> <p>Cells</p> <p>Organisms exchange substances with their environment</p> <p>Genetic information, variation and relationships between organisms</p> <p>Cell recognition and immune response</p>	<p>Revision of skills;</p> <p>Mathematical skills</p> <p>Practical skills</p> <p>Synoptic questions</p>		<p>Ongoing CPAC activities</p> <p>Bi-weekly assessments</p> <p>End of unit assessments</p> <p>PPQs homework</p>