

Key Stage 5 Curriculum Overview

Subject: Biology

Year 12

Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2	Assessment
<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>Revision;</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>CPAC</p> <p>End of unit assessment</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>CPAC</p> <p>End of unit assessment</p> <p>PPQs homework</p>