Key Stage 5

Subject: Biology

Intent

This course is designed to provide students with a foundation understanding of key biological concepts required to continue onto further studies including Medicine, Dentistry, Research, Veterinary Medicine, Nursing, Midwifery etc. The course delivers a wide array of biological topics such as allowing students to comprehend the fundamental biological reactions that allow life to exist on earth, the action of an organism at a cellular level, alongside a brief insight into the gross anatomy of animals and plants. Furthermore, this course develops the students scientific disciplines when undertaking the required practical activities (RP), ensuring that assessment criteria are met in order for pupils to grasp the detailed nature of experimental design.

Programme of study and assessment

	Autumn Term	Spring Term	Summer Term
Year 12	Topic 2 – Cellular structure • Microscopic study of cells • Magnification • Eukaryotic cell structure • Prokaryotic cell structure • Viruses • Mitosis and the cell cycle RP2	Topic 3 – Exchange systems and Mass transport • Gas exchange in organisms • Digestive system • Haemoglobin and circulation • Heart structure and cardiac cycle RP5 • Plant transport systems	Topic 5 – Energy transfers (Photosynthesis+respiration) • Light dependent and independent reaction • Glycolysis, link reaction and krebs cycle • Oxidative phosphorylation • Anaerobic respiration RP7 + RP8 + RP9
	Topic 1 – Biological molecules • Monomers and polymers • Carbohydrates • Lipids • Proteins RP1 • Enzymes and enzyme action	Topic 2 – Cell membranes and immunity • Transport of molecules • Cell membranes • Immunity • Vaccination RP3 + RP4	Topic 7 – Genetics and inheritance • Inheritance • Codominance and multiple alleles • Sex and autosomal linkage • Epistasis • Chi squared
	Topic 1 – Nucleic acids • Structure of RNA and DNA • DNA replication • ATP • Water and it's functions	Topic 4 – Genetic information and diversity • DNA and chromosomes • RNA structure • Protein synthesis • Mutation, meiosis and variation • Types of selection • Species and taxonomy • Species and community diversity	Exam practice • Statistical tests • Maths skills • Examination questions • Extra curricular reading

		• Investigating diversity RP6	
Assessment	Test 1- Biological molecules Test 2 - Nucleic acids Test 3 - Cellular structure	Test 4 - Cell transport Test 5 – Exchange and mass transport Test 6 – Genetic information Test 7 - Biodiversity	May: MOCK EXAM (AS) Test 8 – Energy transfers
Year 13	Topic 5 –Energy cycles • Energy transfer • Nutrient cycles • Fertilisers and their issues Topic 6 – Organism responses and nervous system • Responses RP10 • Nervous system; Reflex arcs, neurones • Generator and action potentials • Receptors and synapses • Action of muscle contraction and control Topic 6 – Endocrine system • Principles of homeostasis • Glucoregulation • Osmoregulation RP11	Essay practice/Revision • Review of statistical tests • Maths skills practice • Examination questions • Extra-curricular reading • Teacher led questioning • AS review of content	
	Topic 7 – Populations and evolution • Population genetics • Selection, evolution and speciation • Ecosystems RP12 • Competition and predation • Succession and conservation Topic 8 – Genetic expression and gene technology	Required practical catch up period/Revision	

	• Mutations and cancer • Stem cells • Regulation of protein synthesis • Epigenetics • Genome projects • DNA fragments and cloning • Genetic screening and fingerprinting		
Assessment	Test 9 – Energy cycles Test 10 – Response to change Test 11 - Homeostasis Test 12 - Populations	Jan: MOCK EXAM (A2) Test 13 – Gene expression Test 14 – Gene technology	EXAMINATIONS