Curriculum Overview – BIOLOGY

All students will join us having already covered some of the foundations of Biological knowledge and practical skills in Year 7 and 8. Cell structure, for example, is covered in Year 7 and revisited at the beginning of Year 9 in greater depth and builds on the pupils' microscopy skills.

During the GCSE years pupils are taught topics in a logical sequence which builds upon prior knowledge and provides the scaffolding for future learning. Each topic is taught over several weeks and is assessed by a formal test, after which pupils have the opportunity to reflect on their progress and set targets for improvement. Whilst learning a new topic summative assessment takes the form of self and peer assessment in class in addition to online assignments, which allow for swift and personalised feedback. In all topics, relevant links are made to Chemistry and Physics to help students regard science as a single subject with interconnecting strands where each has a key purpose.

By the end of Year 11, students will have a comprehensive understanding of Biology encompassing a wide range of topics and the skills necessary, including both practical and analytical, to prepare them for A level. Through a range of practical activities students will have investigated a wide range of topics, for example, the action of enzymes, linking back to their work in Year 8. Students will have looked in more depth at genetics, variation and evolution, the building blocks of which were taught in Year 8, and the impact of recent genome research on the diagnosis and treatment of inherited diseases. Throughout the course pupils will have enrichment opportunities to attend lectures and take part in trips to enhance their learning. They also take part in the Biology Challenge in Year 10. Students will develop an appreciation of the importance of Biology in a wider context including current developments in Biology, for example medicine, ecology and biotechnology.

Studying Biology at A level allows students to develop a more sophisticated knowledge and understanding of topics already studied at GCSE but also introduces new subject areas such as Biochemistry and Genome Technologies. A subscription to Biological Sciences Review enables pupils to read beyond the specification, establish links between topics and other subjects. The range of student led Biological societies and clubs allow them to explore different potential career

pathways, fostering independence and leadership. There are opportunities to attend subject specific conferences and residential trips, and compete in the Intermediate Biology Olympiad and the British Biology Olympiad.

Key Stage 3

Year 7	Year 8	Year 9
N/A – See Lower School Science	N/A – See Lower School Science	Cells and microscopy
		Cell division and the role of stem cells
		Transport in cells – investigating osmosis
		Lungs as an exchange surfcae
		Plant biology and measuring rate of photosynthesis
		Digestion and investigating rate of enzyme activity

Key Stage 4 – GCSE Exam Board: AQA

Year 10	Year 11
The Heart and the Circulatory system,	Structure of DNA and how proteins are made including effect of mutation
Gas Exchange link to exercise and respiration	Meiosis vs mitosis in reproduction
Aerobic, Anaerobic respiration and exercise	Mendel and how characteristics are inherited
Non-communicable diseases eg cancer and CHD	Variation & evolution by natural selection including antibiotic resistance and extinction
Plant diseases and their identification	Gene technology including cloning and genetic engineering
Communicable disease in animals and defences	Ecology including measuring biotic and abiotic factors
Discovery and uses of drugs including the use of monoclonal antibodies	Human impact on the environment
Nervous system and measuring response times	Food security
Structure of brain and eye	
Homeostatic mechanisms and treatment of kidney disease and diabetes	
Role of sex hormones and the menstrual cycle	
Controlling fertility	
Role of plant hormones and investigating the effect of light on seedling growth	

Key Stage 5 – A Level Exam Board: OCR

Year 12	Year 13
Maths in biology throughout the course	
Cells, microscopy, membranes and transport across membranes	Homeostasis and the role of the endocrine and nervous systems
Exchange surfaces and measuring lung volumes	Excretion including the role of the liver and kidneys
Transport in plants and animals including heart dissection and measuring transpiration rate	Respiration and investigating the rate of respiration in yeast
Biological molecules including qualitative and quantitative testing	Photosynthesis & plant hormones including using TLC to separate photosynthetic pigments
Diseases and defences in plants and animals	Behaviour in animals including the role of the brain and muscles
Role of enzymes and investigating factors affecting	Cloning and ethics
Cell division including microscopy and role of stem cells	Biotechnology, DNA sequencing and genetic engineering including culturing microbes
Classification & evolution	Gene regulation and the effect of mutations
Biodiversity & conservation	Inheritance and population genetics
	Ecology including sampling techniques