Key Stage 4 Curriculum Map Department: Science Subject: Biology Year: 10

Term	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Unit Title(s)	**Cell structure and Transport** **Enzymes and Digestion**	**Environment**	**Heart, Circulation and Respiration** **DNA and Inheritance**	**Cell Division**	**Immunology and disease**	**Biodiversity**
Overview / rationale & statement of importance	Students will develop a high-quality understanding of the world through biology. They will be given opportunities to develop skills in evaluation, assessing evidence and presenting data alongside their growing knowledge of the natural world. Students will build on their knowledge of Biology from Key Stage 3, deepening their appreciation of the natural world, the cells and systems in their own bodies and the mechanisms of inheritance. Students will have the opportunity to develop practical skills, increasing manual dexterity and the ability to work as a team, communicating ideas and interpreting instructions clearly.					
Iterative Links	KS3 Cell structure (Year 7) KS3 Digestive system (Year 8)	KS3 Wonders of the Natural World (Year 9) KS3 Ecology topics (Year 9)	KS3 Circulatory System KS3 Respiration KS3 Inheritance (Year 8)	Y10 Aut 1 Cell structure	KS3 Health and Disease (Year 9)	KS3 Ecology (Year 9) Y10 Aut 2 Environment
Knowledge & Understanding	• Cell structure • Roles of organelles • Microscopy, including magnification calculations • Transport of substances into and out of cells • Levels of organisation in living organisms • Enzyme structure and function • The digestive system, including enzymes and bile • The uses of the products of digestion Required practicals • Investigate the effect of salt or sugar solutions on plant tissue • Use a light microscope to observe, draw and label a selection of plant and animal cells • Use qualitative reagents to test for a range of carbohydrates, lipids and proteins • Investigate the effect of pH on the rate of reaction of amylase enzyme	• Trophic levels in an ecosystem • Interdependence • Adaptations • The carbon cycle and water cycle Biology only: • Pyramids of Biomass • Energy transfer through an ecosystem • Food security • Decay Biology only required practical • The effect of a factor on the rate of decay of fresh milk by measuring pH change	• The structure of the heart, lungs and circulatory system • The word and symbol equations for aerobic and anaerobic respiration • Anaerobic fermentation in yeast • The consequences of anaerobic respiration • The structure and role of DNA in cells • Monohybrid inheritance including drawing genetic diagrams • Inherited disorders • Ethical issues involved in genetic screening Biology only • Protein synthesis • The effect of mutations on DNA and protein structure	• The stages in the cell cycle • Stem cells • Differentiation of animal and plant cells	• Defence against disease • Vaccination • Drug discovery and development • The pathogens that cause specific diseases. Biology only • Monoclonal antibody production.	• Sampling an ecosystem using quadrats and transects • Biodiversity • Threats to biodiversity including deforestation, peat bog destruction and global warming • Land use and waste management Required practical • investigate the population size of a common species in a habitat
Skills	Practical skills Working scientifically Fluency in science knowledge Enquiry processes Scientific oracy Independent study		Practical skills Working scientifically Fluency in science knowledge Enquiry processes Scientific oracy Independent study		Practical skills Working scientifically Fluency in science knowledge Enquiry processes Scientific oracy Independent study	

Literacy	- Topic factual summaries develop scientific vocabulary - Literacy-specific tasks develop students' scientific reading - Extended writing questions prepare students for 6-mark questions in GCSE exams. - Use of appropriate scientific terminology		- Topic factual summaries develop scientific vocabulary - Literacy-specific tasks develop students' scientific reading - Extended writing questions prepare students for 6-mark questions in GCSE exams. Use of appropriate scientific terminology		- Topic factual summaries develop scientific vocabulary - Literacy-specific tasks develop students' scientific reading - Extended writing questions prepare students for 6-mark questions in GCSE exams. Use of appropriate scientific terminology	
Numeracy	- Graph skills - Calculate results - Present observations and data - Evaluate data - Using SI units - Statistical techniques - Data analysis - Use and derive simple equations		- Graph skills - Calculate results - Present observations and data - Evaluate data - Using SI units - Statistical techniques - Data analysis - Use and derive simple equations		- Graph skills - Calculate results - Present observations and data - Evaluate data - Using SI units - Statistical techniques - Data analysis - Use and derive simple equations	
Assessment	Informal assessment in class and through homework activity Summative assessment.	Informal assessment in class and through homework activity	Informal assessment in class and through homework activity Summative assessment.	Informal assessment in class and through homework activity	Informal assessment in class and through homework activity Summative assessment – end of year exam.	Informal assessment in class and through homework activity
Cross-curricular	Food and nutrition – dietary intake	Geography – knowledge of the environment, food security, populations and ecosystems	PE – Heart and circulation PSHE – genetic diseases		PSHE – Health	Geography – ecosystem diversity, sampling techniques