Key Stage 5 Biology

	Autumn	Spring	Summer
Year 12	Biological Molecules Cells, Viruses, and reproduction of Living things	Exchange and Transport Classification and Biodiversity	Classification and Biodiversity Ecosystems
Year 13	Ecosystems Energy from Biological processes Modern Genetics Origins of Genetic Variation	Microbiology and Pathogens Control Systems	

Year 12 Biology

Autumn	Biological Molecules Topic 1.1-1.7	Pupils will develop their knowledge & understanding of: • The chemicals of life: the organic and inorganic molecules and ions that are fundamental to the structure and physiology of living organisms. • The role of monomers in the synthesis of polymers and how the structure and properties of these relate to their functions. • The scientific method in the practical investigation of enzyme action
	Cells, Viruses, and reproduction of Living things Topic 2.1-2.5	Pupils will develop their knowledge & understanding of: • The ultrastructure of prokaryotes, eukaryotes, and viruses. • In detail, the types of nuclear division and how these are involved in animal and plant reproduction. • Microscopy and observational skills through the preparation of stained plant tissue.
Spring	Exchange and Transport Topic 4.1-4.7	Pupils will develop their knowledge & understanding of: • Transport mechanisms in cells and mass flow systems in organisms. • The roles of the components of the mammalian circulatory system and the vascular system in plants. • Practical skills through the investigation of factors that affect membrane permeability and water potential of plant tissues

	Classification and Biodiversity Topic 3.1-3.2	Pupils will develop their knowledge & understanding of: • The evidence used in the development of models for the classification of organisms and the limitations of these models. • The principles underlying natural selection and how this can lead to speciation.
Summer	Classification and Biodiversity Topic 3.3	Pupils will develop their knowledge & understanding of: • The principles of sampling as applied to scientific data, and assessment of species diversity using a formula to calculate an index of diversity
	Ecosystems Topic 10.2,10.4	Pupils will develop their knowledge & understanding of: • Human influences on ecosystems and the need for conservation. • Estimating results; constructing and interpreting frequency tables and diagrams, • Bar charts and histograms; understanding principles of sampling, including use of a formula to calculate an index of diversity; understanding the terms mean, median and mode • Selecting and using statistical tests, including the Chi squared test, Student's t-test of difference, Spearman's rank, correlation coefficient; standard deviation and range.

Year 13 Biology

Autumn	Ecosystems Topic 10.1, 10.3	Pupils will develop their knowledge & understanding of: • The interactions between the organisms and the environment within an ecosystem. • How biotic and abiotic factors are involved in the development of ecosystems over time.
	Energy from Biological processes Topic 5.1-5.7	Pupils will develop their knowledge & understanding of: • Carbohydrates and enzymes. • The sources of energy in living organisms and how energy transfers take place. • The stages in respiration and photosynthesis, the roles of co-enzymes and electrons and the uses of intermediates. • Practical skills for the investigation of photosynthetic pigments and the factors that affect rates of respiration and photosynthesis
	Modern Genetics Topic 7.1-7.4	Pupils will develop their knowledge & understanding of: • Nucleic acids and proteins and how they are involved in gene expression. • Epigenetics, the use of stem cells and how these are contributing to medical advances. • The ethical implications of the use of gene technology in scientific developments.

	Origins of Genetic Variation Topic 8.1-8.3	Pupils will develop their knowledge & understanding of: • Meiosis and natural selection. • Dihybrid inheritance of alleles and genes. • The inheritance of unlinked and linked genes. • The effect of selection pressures on the allele frequencies in gene pools and their impact on speciation.
Spring	Microbiology and Pathogens Topic 6.1-6.7	Pupils will develop their knowledge & understanding of: • Prokaryotes, eukaryotes, viruses, and transport systems. • How some microorganisms act as pathogens. • How the human body responds to infection • The social, economic, and ethical implications of the methods of treatment and control of the spread of infection. • Microbial techniques used in the isolation of bacteria and the investigation of the factors that affect their rate of growth.
	Control Systems Topic 9.1-9.9	Pupils will develop their knowledge & understanding of: • Transport mechanisms and the processes of chemical and nervous coordination. • The role of plant growth substances and hormonal control in mammals. • Osmoregulation in mammals adapted to dry environments. • The effect of drugs on the transmission of nerve impulses. • Practical skills in the investigation of the effect of gibberellin on germination.