

Curriculum Content Map		Subject:												
		Term 1												
		September	October	November	December	January	February	March	April	May	June	July		
		Term 2												
		September	October	November	December	January	February	March	April	May	June	July		
Cultural Transmission	Units of Work		Basic components of living systems (EFL) Biological Molecules (CYE)	Biological Membranes (EFL) Biological Molecules (CYE)	Biological Membranes (EFL) Enzymes (CYE)	Cell Division (EFL) Enzymes (CYE)	Cell Division (EFL) Exchange surfaces and breathing (ADU)	Communicable Diseases (EFL) Exchange surfaces and breathing (ADU) Mammalian Transport Systems (ADU)	Classification and evolution (EFL) Mammalian Transport Systems (ADU)	Transport in plants (ADU) Biodiversity (EFL)	REVISION (ADU) Biodiversity (EFL)	Revision (ADU) Biodiversity (EFL)	Introduction to year 13	
	Syllabus reference		Module 1 Development of practical skills in biology 1.1/1.2 Practical Skills Module 2 Foundations in biology 2.1.2 Biological molecules 2.1.3 Cell structure	Module 1 Development of practical skills in biology 1.1/1.2 Practical Skills Module 2 Foundations in biology	Module 1 Development of practical skills in biology 1.1/1.2 Practical Skills Module 2 Foundations in biology 2.1.6 Enzymes	Module 1 Development of practical skills in biology 1.1/1.2 Practical Skills Module 2 Foundations in biology 2.1.6 Cell division, cell diversity and cellular respiration	Module 1 Development of practical skills in biology 1.1/1.2 Practical Skills Module 2 Foundations in biology 2.1.6 Cell division, cell diversity and cellular respiration	Module 1 Development of practical skills in biology 1.1/1.2 Practical Skills Module 3 Exchange and transport 3.1.3 Transport in plants	Module 1 Development of practical skills in biology 1.1/1.2 Practical Skills Module 3 Exchange and transport 4.2.2 Classification and Evolution	Module 1 Development of practical skills in biology 1.1/1.2 Practical Skills Module 3 Exchange and transport 3.1.3 Transport in plants 4.2.2 Classification and Evolution	Module 1 Development of practical skills in biology 1.1/1.2 Practical Skills Module 4 Biodiversity, evolution and disease 4.1.1 Communicable diseases, disease	Module 1 Development of practical skills in biology 1.1/1.2 Practical Skills Module 4 Biodiversity, evolution and disease 4.1.1 Communicable diseases, disease	Module 1 Development of practical skills in biology 1.1/1.2 Practical Skills Module 2 Foundations in biology Module 3 Exchange and transport	Module 1 Development of practical skills in biology 1.1/1.2 Practical Skills Module 2 Foundations in biology Module 3 Exchange and transport
	Substantive knowledge	The What!	EFL: Students to demonstrate knowledge, understanding, and application of: • the use of staining in light • the representation of cell structure seen under light microscope using scientific, annotated drawings • the magnification formula. • the ultrastructure and function of eukaryotic cellular components • the interrelationship between the organelles involved in the production and secretion of proteins. • the importance of the cytoskeleton • the ultrastructure of eukaryotic cells (plants) • the functions of the cellular components • the structure and ultra structure of prokaryotic cells and eukaryotic cells. CYE: • how hydrogen bonding occurs between water molecules • how the properties of water relate to its roles in living organisms. • monomers and polymers as biological molecules. • the chemical elements that make up biological molecules • the key inorganic ions that are involved in	EFL: • the roles of membranes within cells and at the surface of cells • the fluid mosaic model of membrane structure and the roles of its components. • factors affecting membrane structure and permeability • the passive movement of molecules across membranes. • active transport of molecules across membranes • endocytosis and exocytosis as processes requiring ATP. • the movement of water across membranes by osmosis • the effects that solutions of different water potential can have on plant and animal cells CYE: Students will demonstrate knowledge, understanding, and application of: • the general structure of an amino acid (monomer) • the synthesis and breakdown of dipeptides and polypeptides (polymers) • the levels of protein structure • the structure and function of globular proteins including a conjugated protein • the properties and functions of fibrous proteins. • the key inorganic ions that are involved in	EFL: • the movement of water across membranes by osmosis • the effects that solutions of different water potential can have on plant and animal cells CYE: Students will demonstrate knowledge, understanding, and application of: • the role of enzymes in catalysing reactions that affect metabolism at a cellular and whole organism level • the role of enzymes in catalysing both intracellular and extracellular reactions • the mechanism of enzyme action. • the effects of pH, temperature, enzyme concentration and substrate concentration on enzyme activity	EFL: • the cell cycle • how the cell cycle is regulated • the main stages of mitosis. • the significance of mitosis in life cycles how cells of multicellular organisms are specialised • the organisation of cells into tissues, organs and organ systems. CYE: • the need for coenzymes, cofactors, and prosthetic groups in some enzyme controlled reactions • the role of inactive precursors the effects of inhibitors on the rate of enzyme-controlled reactions.	EFL: • the features and differentiation of stem cells the production of • erythrocytes and neutrophils • the production of xylem vessels and phloem sieve tubes • the potential uses of stem cells in research and medicine. (ADU) • the need for specialised exchange surfaces • the features of an efficient exchange surface • the structures and functions of the components of mammalian gaseous exchange system	EFL: • the features and differentiation of stem cells the production of • erythrocytes and neutrophils • the production of xylem vessels and phloem sieve tubes • the potential uses of stem cells in research and medicine. (ADU) • the need for specialised exchange surfaces • the features of an efficient exchange surface • the structures and functions of the components of mammalian gaseous exchange system	ADU: Students will demonstrate knowledge, understanding, and application of: • the mechanism of ventilation and gas exchange in insects • the mechanisms of ventilation and gas exchange in bony fish • the external and internal structure of the mammalian heart • the cardiac cycle and how the heart action is initiated and coordinated EFL: Demonstrate knowledge, understanding, and application of: • the different types of pathogen that can cause communicable diseases in plants and animals • transmission of animal and plant communicable pathogens • plant defences against pathogens. • the primary non-specific defences against pathogens in animals the structure and mode of action of phagocytes	ADU: Students will demonstrate knowledge, understanding, and application of: • the need for transport systems in multicellular plants • the structure and function of the vascular system in the roots, stems and leaves of herbaceous dicotyledonous plants • the process of transpiration and the environmental factors that affect transpiration rate • the transport of water into the plant, through the plant and to the air surrounding the leaves • the mechanisms of water movement in plants. EFL: • the different types of adaptations of organisms to their environment • why organisms from different taxonomic groups may show • similar anatomical features the mechanism by which natural selection can affect the characteristics of a population over time • how evolution in some species has implications for human populations. • international and local conservation	ADU: Students will demonstrate knowledge, understanding, and application of: • the need for transport systems in multicellular plants • the structure and function of the vascular system in the roots, stems and leaves of herbaceous dicotyledonous plants • the process of transpiration and the environmental factors that affect transpiration rate • the transport of water into the plant, through the plant and to the air surrounding the leaves • the mechanisms of water movement in plants. EFL: • the different types of adaptations of organisms to their environment • why organisms from different taxonomic groups may show • similar anatomical features the mechanism by which natural selection can affect the characteristics of a population over time • how evolution in some species has implications for human populations. • international and local conservation	EFL: Students should demonstrate knowledge, understanding, and application of: • how biodiversity may be considered at different levels • how sampling is used in measuring the biodiversity of a habitat and the importance of sampling random and non-random sampling • the importance of sampling the range of organisms in a habitat. • how genetic biodiversity may be assessed, for example, by the calculation of the percentage of gene variants (alleles) in a genome • factors affecting genetic biodiversity in isolated populations • the factors affecting biodiversity, including human population growth, agriculture and climate change • the ecological, economic and aesthetic reasons for maintaining biodiversity in situ and ex situ methods of maintaining biodiversity • international and local conservation	EFL: Students should demonstrate knowledge, understanding, and application of: • the ecological, economic and aesthetic reasons for maintaining biodiversity in situ and ex situ methods of maintaining biodiversity • international and local conservation agreements made to protect species and habitats.	Range of teacher planned activities related to specific needs of pupils
	Disciplinary knowledge	The How!	PAG1 Use of a light microscope at high power and low power, and use of a graticule. Students should produce scientific drawings from observations with annotations. Students research or are given a variety of photomicrographs and use them to identify a	PAG2 Separation of biological compounds using thin layer / paper chromatography or electrophoresis • practical investigations into factors affecting membrane structure and permeability	PAG4: Use of appropriate apparatus to record a range of quantitative measurements (to include mass, time, volume, temperature, length and pH). Use of laboratory glassware apparatus for a variety of experimental techniques to include serial dilutions. Use of	The use of microscopes and microscopic images to observe the stages of mitosis and meiosis. • the dissection, examination and drawing of a bony fish and insect trachea • the examination of microscope slides to show histology of exchange surfaces. • the dissection of the mammalian heart and the production of biological diagrams	• the dissection, examination and drawing of a bony fish and insect trachea • the examination of microscope slides to show histology of exchange surfaces. • the dissection of the mammalian heart and the production of biological diagrams	PAG2 Heart dissection Safe use of instruments for dissection of an animal or plant organ. Use of a light microscope at high power and low power, use of a graticule. Production of scientific drawings from observations with annotations	The use of biological trees and construction of a dichotomous key for a group of animals.	PAG 2 Students will examine and draw stained plant tissue sections to show xylem and phloem. PAG 5 practical investigations to estimate transpiration rates - use of the potometer	PAG 3 collecting random and non-random samples in the field • how to measure species richness and species evenness in a habitat. • the use and interpretation of Simpson's Index of Diversity (d) to calculate the	Students will study a variety of case studies of biodiversity loss and recovery around the world and will have compassion for the organisms in these habitats	Range of teacher planned activities related to specific needs of pupils	
	Sequencing (Flow)	Retrieval & Extension	GCSE Edexcel Key Concepts In Biology B1a-d Edexcel Cells and control B2a-d Edexcel Genetics B3a-b Year 13 Neuronal communication	GCSE Edexcel Key Concepts In Biology B1 Edexcel Exchange and transport in animals B8a-c GCSE Edexcel Key Concepts In Biology B1g,h Year 12 2.1.2 biological molecules	GCSE Edexcel Key Concepts In Biology B1g,h Year 12 2.1.2 biological molecules 2.1.3 Nucleotides and nucleic acids 3.1.2 Transport in animals 3.1.3 Transport in plants Year 13	GCSE Edexcel Key Concepts In Biology B1g,h Year 12 2.1.2 biological molecules 2.1.3 Nucleotides and nucleic acids 3.1.2 Transport in animals 3.1.3 Transport in plants Year 13	GCSE Edexcel Key Concepts In Biology B1 Edexcel Exchange and transport in animals B8a-c Year 12 2.1.5 Biological membranes	GCSE Edexcel Key Concepts In Biology B1 Edexcel Health, disease and the development of medicines B5a-i Edexcel Exchange and transport in animals B8a-d Year 12 2.1.5 Biological membranes	GCSE Edexcel Key Concepts In Biology B1 Edexcel Plant structures and their functions B6c-e Edexcel Natural selection and modification B4a-e Year 12 2.1.1 Cell structure 2.1.2 Biological molecules	GCSE Edexcel Plant structures and their functions B6c-e Edexcel Natural selection and modification B4a-e Year 12 2.1.1 Cell structure 2.1.2 Biological molecules	GCSE Edexcel Ecosystems and material cycles B9g-h Year 12 2.1.6 Cell diversity and cellular organisation	GCSE Edexcel Ecosystems and material cycles B9g-h Year 12 2.1.6 Cell diversity and cellular organisation	Various links to KS4 and KS5	
	Summative Assessment		End of topic test chapter 2		End of topic test - Chapter 3 End of topic test - Chapter 5 AP1	AP1 feedback End of topic test Chapter 4	AP2 End of topic test Chapter 6 End of topic test Chapter 7	End of topic test - Chapter 8	• the mechanisms of ventilation and gas exchange in insects	End of topic test Chapter 10	End of topic test chapter 9	End of topic test chapter 12 End of topic test chapter 11		
Personal Empowerment	Virtue		Friendliness & Civility	Justice & Truthfulness	Courage	Generosity	Gratitude	Good Speech	Good Temper & Humour	Self-Mastery		Compassion	Good Sense	
	Link to Virtue	The opportunity to reflect, think deeply and critically about an issue.	Students will be working in small groups to complete practical work and will have to communicate effectively during the practical where they stain cells to observe the process of mitosis.	Students will consider fair testing and the appropriate use of data to provide accurate results in experiments.	Students will have carried out very little A level practical work so far other than microscope work which they will have had experience of at GCSE. Students will have courage to use new pieces of equipment such as the colorimeter.	Students will have to be generous with the equipment in practical lessons so that all students are able to collect reproducible, reliable data	Students will demonstrate gratitude for well adapted ventilation and circulatory systems by looking at the implications of problems with these systems.	Students will demonstrate good speech when they explain the stages of ventilation. Students traditionally find this a difficult topic to grasp. They will use diagrams to help to explain this topic.	Students will demonstrate good temper and good humour with one another as they carry out practical work related to animal transport.	Students will be reflecting on their results from AP3 to improve their understanding of topics which are identified as possible intervention topics before moving to year 13 studies.	Students will be reflecting on their results from AP3 to improve their understanding of topics which are identified as possible intervention topics before moving to year 13 studies.	Students will study a variety of case studies of biodiversity loss and recovery around the world. Students will debate the importance of maintaining biodiversity.	Students will demonstrate good sense by ensuring that they are prepared for their year 13 studies	
Preparation for Work	Skill	Transferable skills	Listening	Leadership	Problem-Solving	Creativity	Staying Positive	Speaking	Staying Positive	Aiming High		Speaking	Teamwork	
	Link to Skill		Students will need to listen carefully to their peers in order to work efficiently and effectively during practical work	Students will be working in small groups in order to complete practical work and collect reliable and reproducible data	Students will use problem solving skills during practical investigations into membrane permeability and factors affecting the rate of enzyme control reactions	Students will demonstrate creativity when setting up laboratory glassware and equipment in practical lessons. Students will also have the opportunity to	Students will demonstrate positivity while revising and taking their second set of mock examinations.	Students will debate whether our education programmes for health are suitable for the modern day world	Students will stay positive and motivate each other during their preparation for their last set of mock examinations this academic year.	Students will focus on improving confidence in some of the key practical techniques in order to be able to answer practical questions in examinations	Students will debate the importance of maintaining biodiversity.	Students will debate the importance of maintaining biodiversity.	Students will work in small groups to complete any outstanding practical work. They will also analyse exemplar questions in small groups on various parts of the syllabus to peer assess answers	
Preparation for Citizenship	SMSC & British Values	Developing opinions on current issues								Cultural	Cultural			
	Link to SMSC & British Values		The work of Staahl and Mendelsson to discover the mechanism of replication of DNA and the evidence that they collected which lead to the development of their theory The work of Watson and Crick (and Rosalind Franklin) to form the theory of the double helix structure of DNA and the controversy of the awarding of a Nobel prize to Watson and Crick							The contribution of Darwin and Wallace in formulating the theory of evolution by natural selection, and fossil, DNA (only genomic DNA at AS level) and molecular evidence.	It is important to understand how the different cultures around the world can have different impacts on the planet and what impact more economically developed countries have on poorer areas. This will also be vital into the future as we need to monitor the impact of quickly developing cultures around the world on our environment			