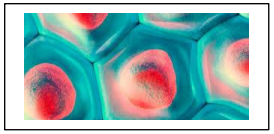

Long Term Plan Year 13 Biology

Half term	Unit title	Key knowledge/ Content to learn and retain	Essential skills to acquire	Link to subject ethos and driver	Anticipated misconceptions	Links to previous KS	Opportunity for stretch for high prior attainers	SMSC & British Values	Cultural Capital	Career Link
One	Energy Transfers	Light dependant and light independent reactions of photosynthesis Leaf pigment chromatography The biochemistry of respiration, including detail of glycolysis, the Krebs Cycle and oxidative phosphorylation	Level three technical and practical skills, including use of advanced glassware to carry out a wide range of investigations. Accurate measurement of substances using a variety of equipment. Safe handling of corrosive and toxic chemicals, including		The various stages, substrates and enzymes of photosynthesis and respiration are very easy to confuse and so will need lots of explicit practice and over teaching	Students will have a very general overview of the starting materials and end products of photosynthesis and respiration; however the vast majority of this unit will be brand new to them.	Control points of respiration - why are they there and what makes them points at which the rate can be controlled?	Safe working in a lab, and respecting each other's working space. Ethical issues surrounding the use of biological samples, including the use of live samples.	The ubiquity of biology allows for examples to be taught in a wide variety of familiar and unfamiliar contexts	An A-level in biology opens to doors to a wide range of STEM field careers. The topics covered in this unit would build the foundations for students to study a range of biomedical and healthcare courses or to enter these fields through employment

			cellular stains Presenting and interpreting data in graphical and tabular form Extended writing, including producing formal lab write ups with references and citations Following written methods							
One	Energy Transfers	Biomass GPP and NPP Food chains and webs - including the importance of simplifying human food chains Nitrogen and phosphorus cycles Minerals in plant growth	Level three technical and practical skills, including use of advanced glassware to carry out a wide range of investigations. Accurate measurement of substances using a variety of equipment. Safe handling		Confusion between the nitrogen and phosphorus cycles	This unit follows on directly from work students have previously done on the carbon and water cycles - extending it to look at two other examples of biological cycles.	Combining cycles and carrying out quantitative analysis	Safe working in a lab, and respecting each other's working space. Ethical issues surrounding the use of biological samples, including the use of live samples.	The ubiquity of biology allows for examples to be taught in a wide variety of familiar and unfamiliar contexts	An A-level in biology opens to doors to a wide range of STEM field careers. The topics covered in this unit would build the foundations for students to study a range of conservation or ecology courses or to enter these fields through

			of corrosive and toxic chemicals, including cellular stains Presenting and interpreting data in graphical and tabular form Extended writing, including producing formal lab write ups with references and citations Following written methods							employment

One	Response	Types of response, including practical investigation of plants and animals The nervous system, including action potential transmission and synapses The Eye as an example of a receptor Control of Heart Rate	Level three technical and practical skills, including use of advanced glassware to carry out a wide range of investigations. Practical Microscopy and drawing of scientific diagrams Accurate measurement of substances using a variety of equipment.		Confusion between charges and direction of ion movement during an action potential.	This unit builds on from work done on homeostasis at KS4. Students should already have an understanding of the structure of the nervous system and its role in maintaining body conditions.	Quantitative analysis of an action potential	Safe working in a lab, and respecting each other's working space. Ethical issues surrounding the use of biological samples, including the use of live samples.	The ubiquity of biology allows for examples to be taught in a wide variety of familiar and unfamiliar contexts	An A-level in biology opens to doors to a wide range of STEM field careers. The topics covered in this unit would build the foundations for students to study a range of biomedical and healthcare courses or to enter these fields through employment

			Safe handling of corrosive and toxic chemicals, including cellular stains Presenting and interpreting data in graphical and tabular form Extended writing, including producing formal lab write ups with references and citations Following written methods							
Two	Response	Homeostasis The control of blood sugar and water potential The second messenger model Diabetes	Level three technical and practical skills, including use of advanced glassware to carry out a wide range of investigations. Practical Microscopy and drawing of		Confusion between positive and negative feedback loops Confusion between types of diabetes	Students will have previously studied the control of blood sugar as an overview and this section of the unit will look at this in more detail before extending by looking at	Quantitative analysis of feedback loops.	Safe working in a lab, and respecting each other's working space. Ethical issues surrounding the use of biological samples, including the use of live samples.	The ubiquity of biology allows for examples to be taught in a wide variety of familiar and unfamiliar contexts	An A-level in biology opens to doors to a wide range of STEM field careers. The topics covered in this unit would build the foundations for students to study a range of

			scientific diagrams Accurate measurement of substances using a variety of equipment. Safe handling of corrosive and toxic chemicals, including cellular stains Presenting and interpreting data in graphical and tabular form Extended writing, including producing formal lab write ups with references and citations Following written methods			control of water potential as a second example of negative feedback				biomedical and healthcare courses or to enter these fields through employment
Three	Genetics, Variation and Evolution	Gene linkage and epistasis	Level three technical and practical skills,		Changing the subject of an equation and	Although this unit follows on from where Y12	Multi-step genetics calculations	Safe working in a lab, and respecting each	The ubiquity of biology allows for examples to	An A-level in biology opens to doors to a

		Chi Squared and Hardy-Weinberg Principle. Practical investigation of allele distribution	including use of advanced glassware to carry out a wide range of investigations. Accurate measurement of substances using a variety of equipment. Safe handling of corrosive and toxic chemicals, including cellular stains Presenting and interpreting data in graphical and tabular form Extended writing, including producing formal lab write ups with references and citations Following written methods		converting units Confusion between dominant and co-dominant, especially when combined with epistatic mechanisms	study of genetics left off, most of the content covered will be new to students, though they will already be familiar with simple genetics terminology such as allele, dominant and hetreozygous		other's working space. Ethical issues surrounding the use of biological samples, including the use of live samples.	be taught in a wide variety of familiar and unfamiliar contexts	wide range of STEM field careers. The topics covered in this unit would build the foundations for students to study a range of biomedical and healthcare courses or to enter these fields through employment

			Mathematical skills, including changing the subject of an equation, multi step problem solving, percentages, graph drawing, drawing tangents to a curve, ratios, using standard form, fractions and working with powers.							
Three	Control of Gene Expression	Cause and impact of genetic mutations The use of Stem Cells Tissue culture, including practical investigation Transcription	Level three technical and practical skills, including use of advanced glassware to carry out a wide range of investigations. Practical Microscopy and drawing of scientific		Confusion between the heritability of genetic and epigenetic information	This unit follows directly on the end of Y12 work on genetics, with much of the content being new to students.	Comparing methods of tissue culture	Safe working in a lab, and respecting each other's working space. Ethical issues surrounding the use of biological samples, including the use of live samples.	The ubiquity of biology allows for examples to be taught in a wide variety of familiar and unfamiliar contexts	An A-level in biology opens to doors to a wide range of STEM field careers. The topics covered in this unit would build the foundations for students to study a range of biomedical and

		factors and epigenetics	diagrams Accurate measurement of substances using a variety of equipment. Safe handling of corrosive and toxic chemicals, including cellular stains Presenting and interpreting data in graphical and tabular form Extended writing, including producing formal lab write ups with references and citations Following written methods							healthcare courses or to enter these fields through employment

Four	Genetics, Variation and Evolution	Speciation Ecological succession Sampling techniques and practical investigation of species distribution	Level three technical and practical skills, including use of advanced glassware to carry out a wide range of investigations. Accurate measurement of substances using a variety of equipment. Safe handling of corrosive and toxic		Definition of a species. Use and application of different sampling techniques.	This unit follows directly on from student's previous study of ecology at the end ofY12	At what point does speciation occur?	Safe working in a lab, and respecting each other's working space. Ethical issues surrounding the use of biological samples, including the use of live samples.	The ubiquity of biology allows for examples to be taught in a wide variety of familiar and unfamiliar contexts	An A-level in biology opens to doors to a wide range of STEM field careers. The topics covered in this unit would build the foundations for students to study a range of conservation or ecology courses or to enter these fields through employment
			chemicals, including cellular stains Presenting and interpreting data in graphical and tabular form Extended writing, including producing formal lab write ups with references and citations Following written methods							

Four	Control of Gene Expression	Tumors DNA Sequencing technology PCR and Gel electrophoresis DNA fingerprinting and diagnosis of genetic disorders	Level three technical and practical skills, including use of advanced glassware to carry out a wide range of investigations. Practical Microscopy and drawing of scientific diagrams Accurate measurement of substances using a variety of equipment. Safe handling of corrosive and toxic chemicals, including cellular stains Presenting and interpreting data in graphical and tabular form Extended writing, including producing formal lab write ups with references and		Confusion between the methodology and application of the different genetic technologies studied.	This unit follows directly on the end of Y12 work on genetics, with much of the content being new to students.	Comparing genetic technologies	Safe working in a lab, and respecting each other's working Space. Ethical issues surrounding the use of biological samples, including the use of live samples.	The ubiquity of biology allows for examples to be taught in a wide variety of familiar and unfamiliar contexts	An A-level in biology opens to doors to a wide range of STEM field careers. The topics covered in this unit would build the foundations for students to study a range of biomedical and healthcare courses or to enter these fields through employment
Five and Six	Time dedicated to revision and exams									