

Year 12 Biology Curriculum

Unit:	Core knowledge/skill development:	Sequence:	Assessment:	Literacy, numeracy, PSHE, FBV, other links	ACP and VAA development:	Home learning and enrichment
Topic 1: Lifestyle Health and Risk	<p>1.1 Understand why many animals have a heart and circulation (mass transport to overcome limitations of diffusion in meeting the requirements of organisms).</p> <p>1.2 Understand the importance of water as a solvent in transport, including its dipole nature.</p> <p>1.3 Understand how the structures of blood vessels (capillaries, arteries and veins) relate to their functions.</p> <p>1.4 i) Know the cardiac cycle (atrial systole, ventricular systole and cardiac diastole) and relate the structure and</p>	<p>1. Introduction</p> <p>2. Heart and circulation</p> <p>3. Structure of the heart and location of blood vessels</p> <p>4. The transport medium (water)</p> <p>5. The structure and function of blood vessels.</p> <p>6. The cardiac cycle</p> <p>7. Events that we lead to atherosclerosis</p> <p>8. Risk</p> <p>9. Identifying the risk of CVD</p> <p>10. CVD risk factors age and gender.</p>	<p>24/10/22: End of Topic Test for Topic 1 (mixed exam questions)</p> <p>28/11/22: Full Past AS Paper 1, which is a mixture of Topic 1 and 2 questions.</p> <p>Term 4: End of Topic Test for Topic 3 (mixed exam questions)</p> <p>Term 6: End of Topic Test for Topic 4 (mixed exam questions)</p> <p>19/06/23: Full AS series, papers 1 and 2, which cover topics 1-4.</p>	<p>A.0 - arithmetic and numerical computation</p> <p>A.0.1 Recognise and make use of appropriate units in calculations</p> <p>- convert between units, e.g. mm³ to cm³ as part of volumetric calculations</p> <p>- work out the unit for a rate, e.g. breathing rate</p> <p>A.0.2 Recognise and use expressions in decimal and standard form</p> <p>- use an appropriate</p>	<p>Topic 1:</p> <p>Self-regulation following Core Practical feedback.</p> <p>Intellectual confidence when discussing the ethics of working with organisms in Biology.</p> <p>Connection finding linking GCSE learning to A Level concepts.</p>	<p>TERM 1:</p> <p>Each week, students are expected to go over their class notes at home and ensure that they understand the concepts covered.</p> <p>Homework 1:</p> <p>Active learn assessments to test prior knowledge for Topic 1 and Core Maths skills. This is self-assessing software which will provide direct feedback.</p> <p>Homework 2:</p> <p>Exam questions heart and the cardiac cycle.</p> <p>Homework 3:</p> <p>Flip learning on stages on the blood clotting process, which students</p>

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	<p>operation of the mammalian heart, including the major blood vessels, to its function.</p> <p>ii) Know how the relationship between heart structure and function can be investigated practically.</p> <p>1.5 Understand the course of events that leads to atherosclerosis (endothelial dysfunction, inflammatory response, plaque formation, raised blood pressure). 1.6 Understand the blood-clotting process (thromboplastin release, conversion of prothrombin to thrombin and</p>	<p>11. CVD risk factors – blood pressure</p> <p>12. CVD risk factors – dietary factors.</p> <p>13. Use of immobilised enzymes</p> <p>14. Lipid structure</p> <p>15. Energy budgets</p> <p>16. Cholesterol</p> <p>17. Other risk factors – genetics</p> <p>18. Further risk factors</p> <p>19. Further risk factors on, which includes Core Practical 2, Investigate the Vitamin C Content of Food or Drink.</p>		<p>number of decimal places in calculations, e.g. for a mean</p> <p>- carry out calculations using numbers in standard and ordinary form, e.g. use of magnification</p> <p>- understand standard form when applied to areas such as size of organelles</p> <p>- convert between numbers in standard and ordinary form</p> <p>- understand that significant figures need retaining when making conversions</p>		<p>will present in next week's lesson.</p> <p>Homework 4:</p> <p>Exam questions on atherosclerosis and the cardiac cycle.</p> <p>Homework 5:</p> <p>Students will complete their Core Practical write ups for the Daphnia Core Practical and the Vitamin C Core Practical.</p> <p>Homework 6:</p> <p>Flip learning, students are to explore the treatments for cardiovascular disease and methods/medication to reduce the risk of cardiovascular disease.</p> <p>Homework 7:</p>

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	<p>fibrinogen to fibrin) and its role in cardiovascular disease (CVD).</p> <p>1.7 Know how factors such as genetics, diet, age, gender, high blood pressure, smoking and inactivity increase the risk of cardiovascular disease (CVD).</p> <p>1.8 Be able to analyse and interpret quantitative data on illness and mortality rates to determine health risks, including distinguishing between correlation and causation and recognising conflicting evidence.</p> <p>1.9 Be able to evaluate the design of studies used to determine health risk</p>	<p>20/21. Effect of caffeine on heart rate, which includes Core Practical 1, the Effect of Caffeine on Daphnia's Heart Core Practical.</p> <p>23. Reducing the risks of CVD</p>		<p>between standard and ordinary form, e.g. $0.0050 \text{ mol dm}^{-3}$ is equivalent to $5.0 \times 10^{-3} \text{ mol dm}^{-3}$</p> <p>A.0.3 Use ratios, fractions and percentages</p> <p>A.1.4 Understand simple probability</p> <ul style="list-style-type: none"> - use the terms probability and chance appropriately - understand the probability associated with genetic inheritance <p>A.1.5 Understand the principles of sampling as</p>		<p>Students are to revise for the End of Topic Assessment for Topic 1.</p>

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	<p>factors, including sample selection and sample size used to collect data that is both valid and reliable.</p> <p>1.10 Understand why people’s perceptions of risks are often different from the actual risks, including underestimating and overestimating the risks due to diet and other lifestyle factors in the development of heart disease.</p> <p>1.11 i) Be able to analyse data on energy budgets and diet.</p> <p>ii) Understand the consequences of energy imbalance, including weight loss, weight gain, and</p>			<p>applied to scientific data</p> <p>- analyse random data collected by an appropriate means, e.g. calculate an index of diversity to compare the biodiversity of a habitat</p> <p>A.1.6 Understand the terms mean, median and mode</p> <p>- calculate or compare the mean, median and mode of a set of data, e.g. height/ mass/size of a group of organisms</p> <p>A.1.7 Use a scatter diagram to identify a</p>		

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	<p>development of obesity.</p> <p>1.12 i) Know the difference between monosaccharides, disaccharides and polysaccharides, including glycogen and starch (amylose and amylopectin).</p> <p>ii) Be able to relate the structures of monosaccharides, disaccharides and polysaccharides to their roles in providing and storing energy (β-glucose and cellulose are not required in this topic).</p> <p>1.13 Know how monosaccharides join to form disaccharides (sucrose, lactose and maltose) and polysaccharides (glycogen and amylose) through</p>			<p>correlation between two variables</p> <ul style="list-style-type: none"> - interpret a scattergram, e.g. the effect of life style factors on health <p>A.1.8 Make order of magnitude calculations</p> <ul style="list-style-type: none"> - use and manipulate the magnification formula magnification = size of image size of real object <p>A.1.9 Select and use a statistical test</p> <ul style="list-style-type: none"> - the Chi squared test to test the significance of the difference between 		

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	<p>condensation reactions forming glycosidic bonds, and how these can be split through hydrolysis reactions.</p> <p>1.14 i) Know how a triglyceride is synthesised by the formation of ester bonds during condensation reactions between glycerol and three fatty acids.</p> <p>ii) Know the differences between saturated and unsaturated lipids.</p> <p>1.15 i) Be able to analyse and interpret data on the possible significance for health of blood cholesterol levels and levels of high-density lipoproteins (HDLs)</p>			<p>observed and expected results</p> <ul style="list-style-type: none"> - the Student's t-test - the correlation coefficient <p>A.1.10 Understand measures of dispersion, including standard deviation and range</p> <ul style="list-style-type: none"> - understand why standard deviation might be a more useful measure of dispersion for a given set of data, e.g. where there is an outlying result 		

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	<p>and low-density lipoproteins (LDLs).</p> <p>ii) Know the evidence for a causal relationship between blood cholesterol levels (total cholesterol and LDL cholesterol) and cardiovascular disease (CVD).</p> <p>1.16 Understand how people use scientific knowledge about the effects of diet, including obesity indicators, body mass index and waist-to-hip ratio, exercise and smoking to reduce their risk of coronary heart disease.</p> <p>CORE PRACTICAL 1: Investigate the effect of caffeine on heart rate in Daphnia.</p>			<p>A.1.11 Identify uncertainties in measurements and use simple techniques to determine uncertainty when data are combined</p> <p>- calculate percentage error where there are uncertainties in measurement</p> <p>A.2 – algebra</p> <p>A.2.1 Understand and use the symbols: =, <>, >, α, ~.</p> <p>A.2.2 Change the subject of an equation</p> <p>- use and manipulate</p>		

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	<p>1.17 Be able discuss the potential ethical issues regarding the use of invertebrates in research.</p> <p>CORE PRACTICAL 2: Investigate the vitamin C content of food and drink.</p> <p>1.18 Know the benefits and risks of treatments for cardiovascular disease (CVD) (antihypertensives, statins, anticoagulants and platelet inhibitors).</p>			<p>equations, e.g. magnification</p> <p>A.2.3 Substitute numerical values into algebraic equations using appropriate units for physical quantities</p> <p>- use a given equation</p> <p>A.2.4 Solve algebraic equations</p> <p>- solve equations in a biological context, e.g. cardiac output = stroke volume x heart rate</p> <p>A.2.5 Use logarithms in relation to quantities that range over</p>		

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				<p>several orders of magnitude</p> <ul style="list-style-type: none"> - use a logarithmic scale in the context of microbiology, e.g. growth rate of a microorganism such as yeast 		
<p>Topic 2: Genes and Health</p>	<p>2.1 i) Know the properties of gas exchange surfaces in living organisms (large surface area to volume ratio, thickness of surface, difference in concentration).</p> <p>ii) Understand how the rate of diffusion is dependent on these properties and can be calculated using Fick's Law of Diffusion.</p> <p>iii) Understand how the structure of the</p>	<p>1. Introduction to the topic.</p> <p>2. Diffusion and surface area to volume ratio</p> <p>3. Structure of alveoli and SA:V ratio; properties of gas exchange surfaces.</p> <p>4/5. Protein structure and function.</p> <p>6. Membrane structure.</p>		<p>A.0.3 Use ratios, fractions and percentages</p> <ul style="list-style-type: none"> - calculate percentage yields - calculate surface area to volume ratio - use scales for measuring - represent phenotypic (monohybrid and dihybrid crosses) 	<p>Topic 2:</p> <p>Abstraction the ability to move from concrete ideas about cell membranes to abstract models which help us to understand their structure and function.</p> <p>Automaticity: use of techniques such as dual coding to ensure that students are able to recall complicated concepts such as the regulation of ions across lung membranes without active thinking.</p>	<p>TERM 2:</p> <p>Homework 1: Active learn end of topic task assessment for Topic 1 and Prior Knowledge task for Topic 2.</p> <p>Homework 2:</p> <p>Exam questions on protein structure and function.</p> <p>Homework 3:</p> <p>Core Practical write up for the effect of Temperature on Cell</p>

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	<p>mammalian lung is adapted for rapid gaseous exchange.</p> <p>2.2 i) Know the structure and properties of cell membranes.</p> <p>ii) Understand how models such as the fluid mosaic model of cell membranes are interpretations of data used to develop scientific explanations of the structure and properties of cell membranes.</p> <p>CORE PRACTICAL 3: Investigate membrane structure, including the effect of alcohol concentration or temperature on membrane permeability.</p>	<p>7. Membrane structure, which includes Core Practical 3: The Effect of Alcohol and Temperature on Membrane Permeability.</p> <p>8. Transport across membranes</p> <p>9. Membrane transport in epithelial cells.</p> <p>10. Enzymes structure and function.</p> <p>11/12. Enzyme concentration and digestion, Core Practical 4: Investigate the effect of enzyme and substrate concentrations on</p>		<p>A.0.4 Estimate results</p> <p>- estimate results to sense check that the calculated values are appropriate</p> <p>A.0.5 Use calculators to find and use power, exponential and logarithmic functions</p> <p>- estimate the number of bacteria grown over a certain length of time</p>	<p>Confident: recognise the need to change your ideas about cell transport and membranes from GCSE, whilst still building upon prior knowledge and learning.</p>	<p>Membranes Core Practical.</p> <p>Homework 4:</p> <p>Enzymes structure and function exam questions.</p> <p>Homework 5:</p> <p>Enzyme Rates Core Practical write up.</p> <p>Homework 6:</p> <p>Protein synthesis and replication exam questions.</p> <p>Homework 7:</p> <p>Revision for the AS Paper 1 Assessment.</p>

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	<p>2.3 Understand what is meant by osmosis in terms of the movement of free water molecules through a partially permeable membrane (consideration of water potential is not required).</p> <p>2.4 i) Understand what is meant by passive transport (diffusion, facilitated diffusion), active transport (including the role of ATP as an immediate source of energy), endocytosis and exocytosis.</p> <p>ii) Understand the involvement of carrier and channel proteins in membrane transport.</p>	<p>the initial rate of reaction.</p> <p>13. DNA structure</p> <p>14/15. Protein synthesis</p> <p>16. DNA replication</p> <p>17. Monohybrid inheritance</p> <p>18. Monohybrid inheritance part 2</p> <p>19. Genetic screening</p> <p>20. Genetic screening part 2</p>				

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	<p>2.5 i) Know the basic structure of mononucleotides (deoxyribose or ribose linked to a phosphate and a base, including thymine, uracil, cytosine, adenine or guanine) and the structures of DNA and RNA (polynucleotides composed of mononucleotides linked through condensation reactions).</p> <p>ii) Know how complementary base pairing and the hydrogen bonding between two complementary strands are involved in the formation of the DNA double helix.</p>					

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	<p>2.6 i) Understand the process of protein synthesis (transcription) including the role of RNA polymerase, translation, messenger RNA, transfer RNA, ribosomes and the role of start and stop codons.</p> <p>ii) Understand the roles of the DNA template (antisense) strand in transcription, codons on messenger RNA and anticodons on transfer RNA.</p> <p>2.7 Understand the nature of the genetic code (triplet code, non-overlapping and degenerate).</p> <p>2.8 Know that a gene is a sequence of</p>					

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	<p>bases on a DNA molecule that codes for a sequence of amino acids in a polypeptide chain.</p> <p>2.9 i) Know the basic structure of an amino acid (structures of specific amino acids are not required). ii) Understand the formation of polypeptides and proteins (amino acid monomers linked by peptide bonds in condensation reactions).</p> <p>iii) Understand the significance of a protein's primary structure in determining its three-dimensional structure and properties (globular and fibrous proteins and the types of bonds</p>					

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	<p>involved in its three-dimensional structure).</p> <p>iv) Know the molecular structure of a globular protein and a fibrous protein and understand how their structures relate to their functions (including haemoglobin and collagen).</p> <p>2.10 i) Understand the mechanism of action and the specificity of enzymes in terms of their three-dimensional structure.</p> <p>ii) Understand that enzymes are biological catalysts that reduce activation energy.</p> <p>iii) Know that there are intracellular enzymes catalysing</p>					

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	<p>reactions inside cells and extracellular enzymes produced by cells catalysing reactions outside of cells.</p> <p>CORE PRACTICAL 4: Investigate the effect of enzyme and substrate concentrations on the initial rates of reactions.</p> <p>2.11 i) Understand the process of DNA replication, including the role of DNA polymerase.</p> <p>ii) Understand how Meselson and Stahl's classic experiment provided new data that supported the accepted theory of replication of DNA and refuted competing theories.</p>					

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	<p>2.12 i) Understand how errors in DNA replication can give rise to mutations.</p> <p>ii) Understand how cystic fibrosis results from one of a number of possible gene mutations.</p> <p>2.13 i) Know the meaning of the terms: gene, allele, genotype, phenotype, recessive, dominant, incomplete dominance, homozygote and heterozygote.</p> <p>ii) Understand patterns of inheritance, including the interpretation of genetic pedigree diagrams, in the context of monohybrid inheritance.</p>					

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	<p>2.14 Understand how the expression of a gene mutation in people with cystic fibrosis impairs the functioning of the gaseous exchange, digestive and reproductive systems.</p> <p>2.15 i) Understand the uses of genetic screening, including the identification of carriers, pre-implantation genetic diagnosis (PGD) and prenatal testing, including amniocentesis and chorionic villus sampling.</p> <p>ii) Understand the implications of prenatal genetic screening.</p>					

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	2.16 Be able to identify and discuss the social and ethical issues related to genetic screening from a range of ethical viewpoints.					
Topic 3: Voice of the Genome	<p>3.1 Know that all living organisms are made of cells, sharing some common features.</p> <p>3.2 Know the ultrastructure of eukaryotic cells, including nucleus, nucleolus, ribosomes, rough and smooth endoplasmic reticulum, mitochondria, centrioles, lysosomes, and Golgi apparatus.</p> <p>3.3 Understand the role of the rough endoplasmic reticulum (rER) and the Golgi apparatus in protein transport</p>	<p>1. Introduction to the topic.</p> <p>2. Ultrastructure of eukaryotic cells.</p> <p>3. Eukaryotic and prokaryotic cells.</p> <p>4. The dynamic nature of cells illustrated by the role of the rough endoplasmic reticulum and Golgi apparatus.</p> <p>5. Gamete structure and function.</p> <p>6. Gamete formation and fertilisation.</p>		<p>A.1 - handling data</p> <p>A.1.1 Use an appropriate number of significant figures</p> <p>- report calculations to an appropriate number of significant figures given raw data quoted to varying numbers of significant figures</p> <p>- understand that calculated results can be reported only to the limits</p>	<p>Topic 3:</p> <p>Critical and logical thinking: interpreting and predicting inheritance.</p> <p>Precision: remember the names and functions of the organelles in prokaryotic and eukaryotic cells.</p> <p>Complex and multi-step problem solving: the ability to apply ideas about epigenetic changes to complex problems as seen in the exam papers.</p>	<p>TERM 3</p> <p>Homework 1:</p> <p>Active learn end of topic task assessment for Topic 2 and prior knowledge task for Topic 3.</p> <p>Homework 2:</p> <p>Exam questions on A Level organelles and their function.</p> <p>Homework 3:</p> <p>Exam questions on gamete structure and function.</p> <p>Homework 4:</p>

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	<p>within cells, including their role in the formation of extracellular enzymes.</p> <p>3.4 Know the ultrastructure of prokaryotic cells, including cell wall, capsule, plasmid, flagellum, pili, ribosomes, mesosomes and circular DNA.</p> <p>3.5 Be able to recognise the organelles in</p> <p>3.2 from electron microscope (EM) images.</p> <p>3.6 Understand how mammalian gametes are specialised for their functions (including the acrosome in sperm</p>	<p>7. Linkage of genes and crossing over.</p> <p>8/9. The cell cycle</p> <p>10. The stages of mitosis</p> <p>11. Totipotency</p> <p>12. Stem cell research</p> <p>13. The role of the nucleus in the control of development.</p> <p>14. Differential gene expression</p> <p>15. Cellular organisation</p> <p>16. Differential gene expression part 2</p> <p>17. Polygenetic inheritance</p>		<p>of the least accurate measurement</p> <p>A.1.2 Find arithmetic means</p> <p>- find the mean of a range of data, e.g. the mean number of stomata in the leaves of a plant</p> <p>A.1.3 Construct and interpret frequency tables and diagrams, bar charts and histograms</p> <p>- represent a range of data in a table with clear headings, units and consistent decimal places</p> <p>- interpret data from a variety of</p>		<p>Exam questions on the cell cycle.</p> <p>Homework 5:</p> <p>Exam questions on totipotency and stem cells.</p> <p>Homework 6:</p> <p>Exam questions on polygenetic inheritance and epigenetics.</p> <p>TERM 4:</p> <p>Homework 1:</p> <p>Exam questions on differential gene expression.</p> <p>Homework 2:</p> <p>Exam questions on transcription and translation.</p> <p>Homework 3:</p>

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	<p>and the zona pellucida in the egg).</p> <p>3.7 Know the process of fertilisation in mammals, including the acrosome reaction, the cortical reaction and the fusion of nuclei.</p> <p>3.8 i) Know that a locus (plural = loci) is the location of genes on a chromosome.</p> <p>ii) Understand the linkage of genes on a chromosome and sex linkage.</p> <p>3.9 Understand the role of meiosis in ensuring genetic variation through the production of non-identical gametes as a consequence of independent assortment of</p>	<p>18. How phenotype is a result of genotype and the environment – human height</p> <p>19. How phenotype is a result of genotype and the environment – hair colour</p> <p>20. How genotype is a result of genotype and the environment – monoamine oxidase A (MAOA)</p>		<p>tables, e.g. data relating to organ function</p> <p>- plot a range of data in an appropriate format, e.g. enzyme activity over time represented on a graph</p> <p>- interpret data for a variety of graphs, e.g. explain electrocardiogram traces</p>		<p>Epigenetics task – flip learning.</p> <p>Homework 4:</p> <p>Phenotype exam questions.</p> <p>Homework 5:</p> <p>Further exam questions on inheritance and epigenetics.</p> <p>Homework 6:</p> <p>Revision for the Topic 3 Assessment</p>

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	<p>chromosomes and crossing over of alleles between chromatids (details of the stages of meiosis are not required).</p> <p>3.10 Understand the role of mitosis and the cell cycle in producing identical daughter cells for growth and asexual reproduction.</p> <p>CORE PRACTICAL 5: Prepare and stain a root tip squash to observe the stages of mitosis.</p> <p>3.11 i) Understand what is meant by the terms 'stem cell, pluripotency and totipotency'.</p> <p>ii) Be able to discuss the way society uses scientific knowledge</p>					

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	<p>to make decisions about the use of stem cells in medical therapies.</p> <p>3.12 Understand how cells become specialised through differential gene expression, producing active mRNA leading to synthesis of proteins, which in turn control cell processes or determine cell structure in animals and plants, including the lac operon.</p> <p>3.13 Understand how the cells of multicellular organisms are organised into tissues, tissues into organs and organs into systems.</p>					

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	<p>3.14 i) Understand how phenotype is the result of an interaction between genotype and the environment.</p> <p>ii) Know how epigenetic changes, including DNA methylation and histone modification, can modify the activation of certain genes.</p> <p>iii) Understand how epigenetic changes can be passed on following cell division.</p> <p>3.15 Understand how some phenotypes are affected by multiple alleles for the same gene at many loci (polygenic inheritance) as well as the environment and how this can give rise</p>					

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	to phenotypes that show continuous variation.					
<p>Topic 4: Biodiversity and Natural Resources</p>	<p>4.1 Know that over time the variety of life has become extensive but is now being threatened by human activity.</p> <p>4.2 i) Understand the terms biodiversity and endemism.</p> <p>ii) Know how biodiversity can be measured within a habitat using species richness and within a species using genetic diversity by calculating the heterozygosity index (H):</p> <p>iii) Understand how biodiversity can be compared in different habitats using a</p>	<ol style="list-style-type: none"> 1. Introduction to the topic. 2. What is a species? 3. The concept of niche 4. Adaptations 5. Adaptations part 2 6. Natural selection and evolution 7. Evolution as a change in allele frequency leading to speciation. 8. What is biodiversity? 9. Classification 		<p>A.3 – graphs</p> <p>A.3.1 Translate information between graphical, numerical and algebraic forms</p> <p>- understand that data may be presented in a number of formats and be able to use these data, e.g. dissociation curves</p> <p>A.3.2 Plot two variables from experimental or other data</p> <p>- select an appropriate</p>	<p>Topic 4:</p> <p>Big picture thinking linking an understanding of plant transport and function, to holistic concepts such as the properties of water molecules.</p> <p>Speed and accuracy: the ability to apply the diversity index calculation with both speed and accuracy.</p> <p>Collaborative: Work in teams to complete Core Practical work where students investigate nutrients required by plants. Work in teams, take on a variety of roles, evaluate work and take on the</p>	<p>TERM 5:</p> <p>Homework 1:</p> <p>Active learn end of topic task assessment for Topic 3 and prior knowledge task for Topic 4.</p> <p>Homework 2:</p> <p>Exam questions on adaptations.</p> <p>Homework 3:</p> <p>Exam questions on evolution and natural selection.</p> <p>Homework 4:</p> <p>Exam questions on speciation, diversity and diversity index calculations.</p>

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	<p>formula to calculate an index of diversity (D):</p> <p>4.3 Understand the concept of niche and be able to discuss examples of adaptation of organisms to their environment (behavioural, physiological and anatomical).</p> <p>4.4 Understand how natural selection can lead to adaptation and evolution.</p> <p>4.5 i) Understand how the Hardy-Weinberg equation can be used to see whether a change in allele frequency is occurring in a population over time.</p>	<p>10. Classification part 2</p> <p>11. Measuring biodiversity.</p> <p>12. Measuring genetic diversity</p> <p>13. Structure of plant cells</p> <p>14. Structure and function of starch and cellulose</p> <p>15. Structure and location of specialised cells within the plant stem, which includes Core Practical 6: Identifying sclerenchyma fibres, phloem, sieve tubes and xylem vessels and their location within stems through a light microscope.</p>		<p>format for presenting data, bar charts, histograms, graphs and scattergrams</p> <p>A.3.3 Understand that $y = mx + c$ represents a linear relationship</p> <p>- predict/sketch the shape of a graph with a linear relationship, e.g. the effect of substrate concentration on the rate of an enzyme-controlled reaction with excess enzyme</p> <p>A.3.4 Determine the intercept of a graph</p>	<p>feedback of other students.</p>	<p>Homework 5:</p> <p>Core Practical write-up on plant fibres.</p> <p>Homework 6:</p> <p>Revision for the Topic 4 Assessment.</p> <p>TERM 6:</p> <p>Homework 1:</p> <p>Revision for the End of Year Assessment.</p> <p>Homework 2:</p> <p>Revision for the End of Year Assessment.</p> <p>Homework 3:</p> <p>Succession and ecosystems exam questions.</p> <p>Homework 4:</p>

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	<p>ii) Understand that reproductive isolation can lead to accumulation of different genetic information in populations, potentially leading to the formation of new species.</p> <p>4.6 i) Understand that classification is a means of organising the variety of life based on relationships between organisms using differences and similarities in phenotypes and in genotypes, and is built around the species concept.</p> <p>ii) Understand the process and importance of critical evaluation of new data by the scientific</p>	<p>16. Movement of minerals and water through the xylem.</p> <p>17. Mineral deficiency, which includes Core Practical 7: Investigating mineral deficiencies.</p> <p>18. Strength testing of plant fibres, which includes Core Practical 8: Determining the tensile strength of plant fibres.</p> <p>19. Antibacterial properties of plants, which includes Core Practical 9: Investigating the antimicrobial properties of plants, including aseptic techniques for the safe handling of bacterial.</p>		<p>- read off an intercept point from a graph, e.g. compensation point in plants</p> <p>A.3.5 Calculate rate of change from a graph showing a linear relationship</p> <p>- calculate a rate from a graph, e.g. rate of transpiration</p> <p>A.3.6 Draw and use the slope of a tangent to a curve as a measure of rate of change</p> <p>- use this method to measure the gradient of a point on a curve, e.g. amount of</p>		<p>Script preparation for climate change debate.</p> <p>Homework 5:</p> <p>Therapy work, where students will revise key areas following test feedback.</p> <p>Homework 6:</p> <p>Therapy work, where students will revise key areas following test feedback.</p>

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	<p>community, which leads to new taxonomic groupings, including the three domains of life based on molecular phylogeny, which are Bacteria, Archaea, Eukaryota.</p> <p>4.7 Know the ultrastructure of plant cells (cell walls, chloroplasts, amyloplasts, vacuole, tonoplast, plasmodesmata, pits and middle lamella) and be able to compare it with animal cells.</p> <p>4.8 Be able to recognise the organelles in</p> <p>4.7 from electron microscope (EM) images.</p>	<p>20/21. Drug testing</p> <p>22. Uses of seed-stored starch</p> <p>23. The role of zoos</p> <p>24. The role of zoos part 2</p> <p>25. Seedbanks</p>		<p>product formed plotted against time when the concentration of enzyme is fixed</p> <p>A.4 - geometry and trigonometry</p> <p>A.4.1 Calculate the circumferences, surface areas and volumes of regular shapes</p> <p>- calculate the circumference and area of a circle</p> <p>- calculate the surface area and volume of rectangular prisms, of cylindrical prisms and of spheres</p>		

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	<p>4.9 Understand the structure and function of the polysaccharides starch and cellulose, including the role of hydrogen bonds between β-glucose molecules in the formation of cellulose microfibrils.</p> <p>4.10 Understand how the arrangement of cellulose microfibrils and secondary thickening in plant cell walls contributes to the physical properties of xylem vessels and sclerenchyma fibres in plant fibres that can be exploited by humans.</p> <p>CORE PRACTICAL 6: Identify sclerenchyma fibres, phloem sieve tubes</p>			<p>- e.g. calculate the surface area or volume of a cell</p>		

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	<p>and xylem vessels and their location within stems through a light microscope.</p> <p>4.11 Know the similarities and differences between the structures, position in the stem and function of sclerenchyma fibres (support), xylem vessels (support and transport of water and mineral ions) and phloem (translocation of organic solutes).</p> <p>4.12 Understand the importance of water and inorganic ions (nitrate, calcium ions and magnesium ions) to plants.</p> <p>CORE PRACTICAL 7: Investigate plant mineral deficiencies.</p>					

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	<p>CORE PRACTICAL 8: Determine the tensile strength of plant fibres.</p> <p>4.13 Understand the development of drug testing from historic to contemporary protocols, including William Withering's digitalis soup, double blind trials, placebo, three-phased testing.</p> <p>4.14 Understand the conditions required for bacterial growth.</p> <p>CORE PRACTICAL 9: Investigate the antimicrobial properties of plants, including aseptic techniques for the safe handling of bacteria.</p> <p>4.15 Understand how the uses of plant</p>					

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	<p>fibres and starch may contribute to sustainability, including plant-based products to replace oil-based plastics.</p> <p>4.16 Be able to evaluate the methods used by zoos and seed banks in the conservation of endangered species and their genetic diversity, including scientific research, captive breeding programmes, reintroduction programmes and education.</p>					