

## Year 13 Biology Curriculum

(please note that some of the content in Topic 5: Photosynthesis and Climate Change may be taught at the end of Year 12 if there is time to do so).

Unit	Core knowledge/skill development	Sequence	Assessment	Literacy, numeracy, PSHE, FBV, other links	ACP and VAA development	Home learning and enrichment
Topic 5: On the Wild Side	<p>5.1 Understand the terms ecosystem, community, population and habitat.</p> <p>5.2 Understand that the numbers and distribution of organisms in a habitat are controlled by biotic and abiotic factors.</p> <p>5.3 Understand how the concept of niche accounts for distribution and abundance of organisms in a habitat.</p> <p>CORE PRACTICAL 10: Carry out a study on the ecology of a habitat, such as using quadrats and</p>	<ol style="list-style-type: none"> <li>Topic Introduction</li> <li>Ecosystems – Biotic and Abiotic Factors</li> <li>Studying Ecosystems</li> <li>Core Practical 10 – Habitat Investigation</li> <li>Succession</li> <li>Photosynthesis</li> <li>Photosynthesis Part 2</li> <li>Core Practical 11-</li> </ol>	<p><b>Term 1 October:</b> Year 13 PPE Paper 1 (modified), which will cover Topics 1-5.</p> <p><b>Term 2:</b> End of Topic Test for Topic 6 (mixed exam questions)</p> <p><b>Term 3 February:</b> Year 13 PPE Paper 2 (modified) which will cover Topics 1-4 and 7.</p> <p><b>Term 4:</b> End of Topic Test for Topic 8 (mixed exam questions)</p> <p><b>Term 5:</b> PPE for Paper 3, which is fully synoptic (Topics 1-8) and involves students reading an article.</p>	<p>(v) A.4 - geometry and trigonometry</p> <p>A.4.1 Calculate the circumferences, surface areas and volumes of regular shapes</p> <p>A.2.4 Solve algebraic equations</p> <p>A.1.1 Use an appropriate number of significant figures</p> <p>A.1.2 Find arithmetic means</p> <p>A.1.3 Construct and interpret frequency tables and diagrams,</p>	<p>Topic 1:</p> <p><b>Critical and logical thinking:</b> interpreting and predicting climate impacts.</p> <p><b>Precision:</b> remember the names and functions of parts of the photosynthesis pathways.</p> <p><b>Complex and multi-step problem solving:</b> the ability to apply ideas about epigenetic changes to complex problems as seen in the exam papers.</p>	<p><b>TERM 1:</b></p> <p>Each week, students are expected to go over their class notes at home and ensure that they understand the concepts covered. They should use revision resources to do this such as the Physics and Maths Tutor Website and their CGP revision guide.</p> <p><b>Homework 1:</b></p> <p>Active learn assessments to test prior knowledge from Topics 1-4 and Core Maths skills. This is self-assessing software which will provide direct feedback.</p> <p><b>Homework 2:</b></p>

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	<p>transects to determine distribution and abundance of organisms, and measuring abiotic factors appropriate to the habitat.</p> <p>5.4 Understand the stages of succession from colonisation to a climax community.</p> <p>5.5 Understand the overall reaction of photosynthesis as requiring energy from light to split apart the strong bonds in water molecules, storing the hydrogen in a fuel (glucose) by combining it with carbon dioxide and releasing oxygen into the atmosphere.</p> <p>5.6 Understand how phosphorylation of ADP requires energy and that hydrolysis of</p>	<p>Photosynthesis</p> <p>9. Energy Flow in Ecosystems</p> <p>10. Evidence of Climate Change – Temperature Records</p> <p>11. Evidence of Climate Change – Temperature Records</p> <p>12. Evidence for Climate Change – Pollen in Peat Bogs</p> <p>13. Evidence for Climate Change – Dendrochronology</p>		<p>bar charts and histograms</p> <p>A.1.4 Understand simple probability</p> <p>A.1.5 Understand the principles of sampling as applied to scientific data</p> <p>A.1.6 Understand the terms mean, median and mode</p> <p>A.1.7 Use a scatter diagram to identify a correlation between two variables</p> <p>A.1.8 Make order of magnitude calculations</p>		<p>Exam questions the process of photosynthesis and photosynthesis Core Practical.</p> <p><b>Homework 3:</b></p> <p>Flip learning on the evidence for climate change.</p> <p><b>Homework 4:</b></p> <p>Revision homework for the PPE assessment</p> <p><b>Homework 5:</b></p> <p>Revision homework for the PPE assessment</p> <p><b>Homework 6:</b></p> <p>Exam questions on climate change evidence, modelling and impact.</p> <p><b>Homework 7:</b></p>

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	<p>ATP provides an immediate supply of energy for biological processes.</p> <p>5.7 Understand the light-dependent reactions of photosynthesis including how light energy is trapped by exciting electrons in chlorophyll and the role of these electrons in generating ATP, reducing NADP in photophosphorylation and producing oxygen through photolysis of water.</p> <p>5.8 i) Understand the light-independent reactions as reduction of carbon dioxide using the products of the light-dependent reactions (carbon fixation in the Calvin</p>	<p>14. The Link Between Carbon Dioxide and Global Warming</p> <p>15. Controversy Surrounding the Issue of Climate Change</p> <p>16. Climate Modelling</p> <p>17. Effect of Climate Change on Flora and Fauna Distribution</p> <p>18. Core Practical 12: Temperature and Enzyme Activity</p>		<p>A.1.9 Select and use a statistical test</p> <p>A.1.10 Understand measures of dispersion, including standard deviation and range</p> <p>A.1.11 Identify uncertainties in measurements and use simple techniques to determine uncertainty when data are combined</p> <p>A.2.1 Understand and use the symbols: =, &lt;, &lt;&lt;, &gt;&gt;, &gt;, α, ~.</p>		<p>Therapy work following the PPE feedback.</p>

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	<p>cycle, the role of GP, GALP, RuBP and RUBISCO).</p> <p>ii) Know that the products are simple sugars that are used by plants, animals and other organisms in respiration and the synthesis of new biological molecules (polysaccharides, amino acids, lipids and nucleic acids). CORE PRACTICAL</p> <p>11: Investigate photosynthesis using isolated chloroplasts (the Hill reaction). 5.9 Understand the structure of chloroplasts in relation to their role in photosynthesis.</p> <p>5.10 i) Be able to calculate net primary productivity. ii)</p>	<p>19. Effect of Climate Change on Flora and Fauna - Development</p> <p>20. Effect of Climate Change on Flora and Fauna – Life Cycles</p> <p>21. Evidence by Natural Selection – Molecular Evidence</p> <p>22. Evidence by Natural Selection and Molecular Evidence Part 2</p>		<p>A.2.2 Change the subject of an equation</p> <p>A.2.3 Substitute numerical values into algebraic equations using appropriate units for physical quantities</p> <p>Follows written procedures a) Correctly follows written instructions to carry out the experimental techniques or procedures.</p> <p>a) Correctly uses appropriate instrumentation, apparatus and materials (including ICT) to carry out investigative</p>		

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	<p>Understand the relationship between gross primary productivity, net primary productivity and plant respiration.</p> <p>5.11 Know how to calculate the efficiency of biomass and energy transfers between trophic levels.</p> <p>5.12 Understand the different types of evidence for climate change and its causes (including records of carbon dioxide levels, temperature records, pollen in peat bogs and dendrochronology), recognising correlations and causal relationships.</p> <p>5.13 Understand the causes of</p>	<p>23. Speciation</p> <p>24. The Carbon Cycle</p> <p>25. End of Unit Assessment</p>		<p>activities, experimental techniques and procedures with minimal assistance or prompting.</p> <p>b) Carries out techniques or procedures methodically, in sequence and in combination, identifying practical issues and making adjustments when necessary.</p> <p>c) Identifies and controls significant quantitative variables where applicable, and plans approaches to take account of variables that</p>		

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	<p>anthropogenic climate change, including the role of greenhouse gases (carbon dioxide and methane) in the greenhouse effect.</p> <p>5.14 i) Understand that data can be extrapolated to make predictions and that these are used in models of future climate change.</p> <p>ii) Understand that models for climate change have limitations.</p> <p>5.15 Understand the effects of climate change (changing rainfall patterns and changes in seasonal cycles) on plants and animals (distribution of species,</p>			<p>cannot readily be controlled.</p> <p>d) Selects appropriate equipment and measurement strategies in order to ensure suitably accurate results.</p> <p>a) Independent thinking</p> <ul style="list-style-type: none"> <li>• solve problems set in practical contexts</li> <li>• apply scientific knowledge to practical contexts</li> </ul>		

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	<p>development and life cycles).</p> <p>5.16 Understand the effect of temperature on the rate of enzyme activity and its impact on plants, animals and microorganisms.</p> <p>5.17 Understand how evolution (a change in the allele frequency) can come about through gene mutation and natural selection.</p> <p>5.18 Understand the role of the scientific community (scientific journals, the peer review process, scientific conferences) in validating new evidence, including proteomics and genomics, that supports the</p>					

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	<p>accepted scientific theory of evolution.</p> <p>5.19 Understand how isolation reduces gene flow between populations, leading to allopatric or sympatric speciation. CORE PRACTICAL</p> <p>12: Investigate the effect of temperature on the initial rate of an enzyme-catalysed reaction, to include Q10. CORE PRACTICAL</p> <p>13: Investigate the effects of temperature on the development of organisms (such as seedling growth rate, brine shrimp hatch rates).</p> <p>5.20 Understand the way in which scientific</p>					



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	<p>conclusions about controversial issues, such as what actions should be taken to reduce climate change or the degree to which humans are affecting climate change, can sometimes depend on who is reaching the conclusions.</p> <p>5.21 Understand how knowledge of the carbon cycle can be applied to methods to reduce atmospheric levels of carbon dioxide.</p> <p>5.22 Understand how reforestation and the use of sustainable resources, including biofuels, are examples of the effective management of the conflict between</p>					

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	human needs and conservation.					
<b>Topic 6: Immunity, Infection and Forensics</b>	<p>6.1 Understand how to determine the time of death of a mammal by examining the extent of decomposition, stage of succession, forensic entomology, body temperature and degree of muscle contraction.</p> <p>6.2 Know the role of micro-organisms in the decomposition of organic matter and the recycling of carbon.</p> <p>6.3 Know how DNA profiling is used for identification and determining genetic relationships between organisms (plants and animals).</p>	<ol style="list-style-type: none"> <li>1. Introduction to the Topic</li> <li>2. DNA Profiling</li> <li>3. DNA Profiling Part 2</li> <li>4. Core Practical 14: Gel Electrophoresis</li> <li>5. Determining the Time of Death, Forensic Entomology and Succession</li> <li>6. Determining the Time of Death, Forensic</li> </ol>		<p>A.3.1 Translate information between graphical, numerical and algebraic forms</p> <p>A.3.2 Plot two variables from experimental or other data</p> <p>A.3.3 Understand that <math>y = mx + c</math> represents a linear relationship</p> <p>A.3.4 Determine the intercept of a graph</p> <p>A.3.5 Calculate rate of change from a graph showing a linear relationship</p>	<p><b>Topic 2:</b></p> <p><b>Big picture thinking</b> linking an understanding of DNA profiling and gel electrophoresis to content such as DNA replication which was learnt in Topic 3.</p> <p><b>Speed and accuracy:</b> the ability to apply and analyse gel electrophoresis results with both speed and accuracy.</p> <p><b>Collaborative:</b> Work in teams to complete Core Practical work where students investigate antibiotic resistance. Work in teams, take on a variety of roles, evaluate work and take on the</p>	<p><b>TERM 2:</b></p> <p><b>Homework 1:</b> Active Learn end of topic task assessment for Topic 5 and Prior Knowledge tasks. The self-marking software will provide feedback to students.</p> <p><b>Homework 2:</b></p> <p>Exam questions on DNA profiling and PCR.</p> <p><b>Homework 3:</b></p> <p>Core Practical write up for the DNA Profiling Core Practical.</p> <p><b>Homework 4:</b></p> <p>Immune system and pathogens exam questions.</p>

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	<p>6.4 Know how DNA can be amplified using the polymerase chain reaction (PCR).</p> <p>CORE PRACTICAL 14: Use gel electrophoresis to separate DNA fragments of different length.</p> <p>6.5 Be able to compare the structure of bacteria and viruses. 6.6 Understand how Mycobacterium tuberculosis (TB) and Human Immunodeficiency Virus (HIV) infect human cells, causing a sequence of symptoms that may result in death.</p> <p>6.7 Understand the non-specific responses of the</p>	<p>Entomology and Succession Part 2</p> <p>7. Structure of Bacteria and Viruses</p> <p>8. Non-Specific Responses of the Body to Infection</p> <p>9. The Specific Immune Response</p> <p>10. The Specific Immune Response Part 2</p> <p>11. The Specific Immune Response Part 3</p> <p>12. Tuberculosis – Symptoms</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>a) Identifies hazards and assesses risks associated with these hazards, making safety adjustments as necessary, when carrying out experimental techniques and procedures in the lab or field.</p> <p>b) Uses appropriate safety equipment and approaches to minimise risks with minimal prompting.</p>	<p>feedback of other students.</p>	<p><b>Homework 5:</b></p> <p>Enzyme Rates Core Practical write up.</p> <p><b>Homework 6:</b></p> <p>Protein synthesis and replication exam questions.</p> <p><b>Homework 7:</b></p> <p>Revision for the AS Paper 1 Assessment.</p>

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	<p>body to infection, including inflammation, lysozyme action, interferon, and phagocytosis.</p> <p>6.8 Understand the roles of antigens and antibodies in the body's immune response including the involvement of plasma cells, macrophages and antigen-presenting cells.</p> <p>6.9 Understand the differences between the roles of B cells (B memory and B effector cells) and T cells (T helper, T killer and T memory cells) in the body's immune response.</p> <p>6.10 Understand how one gene can give</p>	<p>13. Tuberculosis – Symptoms Part 2</p> <p>14. HIV/Aids – Symptoms</p> <p>15. HIV/Aids – Symptoms Part 2</p> <p>16. Protein Synthesis</p> <p>17. Protein Synthesis Part 2</p> <p>18. Preventing Pathogens Entry to the Body</p> <p>19. Immunity</p> <p>20. The Effect of Antibiotics on Bacterial Growth</p>		<p>a) Makes accurate observations relevant to the experimental or investigative procedure.</p> <p>b) Obtains accurate, precise and sufficient data for experimental and investigative procedures and records this methodically using appropriate units and conventions.</p> <p>b) Use and application of scientific methods and practices</p> <p>• comment on experimental design and</p>		

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	<p>rise to more than one protein through posttranscriptional changes to messenger RNA (mRNA).</p> <p>6.11 i) Know the major routes pathogens may take when entering the body. ii) Understand the role of barriers in protecting the body from infection, including skin, stomach acid, and gut and skin flora.</p> <p>6.12 Understand how individuals may develop immunity (natural, artificial, active, passive).</p> <p>6.13 Understand how the theory of an 'evolutionary race' between pathogens and their hosts is</p>	<p>21. How Antibiotics Work</p> <p>22. The Evolution of Antibiotic Resistant Bacteria</p> <p>23. End of Unit Assessment</p>		<p>evaluate scientific methods</p> <ul style="list-style-type: none"> <li>• present data in appropriate ways</li> <li>• evaluate results and draw conclusions with reference to measurement uncertainties and errors</li> <li>• identify variables including those that must be controlled</li> </ul>		

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	<p>supported by the evasion mechanisms shown by pathogens.</p> <p>6.14 Understand the difference between bacteriostatic and bactericidal antibiotics.</p> <p>CORE PRACTICAL 15: Investigate the effect of different antibiotics on bacteria.</p> <p>6.15 Know how an understanding of the contributory causes of hospital acquired infections have led to codes of practice regarding antibiotic prescription and hospital practice that relate to infection prevention and control.</p>					

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<b>Topic 7: Run for your Life</b>	<p>7.1 Know the way in which muscles, tendons, the skeleton and ligaments interact to enable movement, including antagonistic muscle pairs, extensors and flexors.</p> <p>7.2 Understand the process of contraction of skeletal muscle in terms of the sliding filament theory, including the role of actin, myosin, troponin, tropomyosin, calcium ions (Ca<sup>2+</sup>), ATP and ATPase.</p> <p>7.3 i) Understand the overall reaction of aerobic respiration as splitting of the respiratory substrate, to release carbon dioxide as a waste product and reuniting</p>	<ol style="list-style-type: none"> <li>Topic Introduction</li> <li>Joins and Movement</li> <li>Muscle Structure and Function</li> <li>Muscle Structure and Function Part 2</li> <li>ATP and Glycolysis</li> <li>ATP and Glycolysis Part 2</li> <li>Electron Transport Chain and Chemiosmosis</li> <li>Electron Transport Chain and Chemiosmosis Part 2</li> </ol>		<p>A.1.1 Use an appropriate number of significant figures</p> <p>A.1.2 Find arithmetic means</p> <p>A.1.3 Construct and interpret frequency tables and diagrams, bar charts and histograms</p> <p>A.1.4 Understand simple probability</p> <p>A.1.5 Understand the principles of sampling as applied to scientific data</p> <p>A.1.6 Understand the terms mean, median and mode</p>	<p><b>Topic 3:</b></p> <p><b>Self-regulation</b> following Core Practical feedback.</p> <p><b>Intellectual confidence</b> when discussing the ethics of working with organisms in Biology.</p> <p><b>Connection finding</b> linking concepts between Year 12 and 13.</p>	<p><b>TERM 3</b></p> <p><b>Homework 1:</b></p> <p>Active learn end of topic task assessment for Topic 6 and prior knowledge task for Topic 7.</p> <p><b>Homework 2:</b></p> <p>Exam questions on respiration.</p> <p><b>Homework 3:</b></p> <p>Exam questions on aerobic capacity and cardiac output.</p> <p><b>Homework 4:</b></p> <p>Exam questions on lung volumes and breathing rate.</p> <p><b>Homework 5:</b></p> <p>Exam questions on homeostasis.</p>

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	<p>of hydrogen with atmospheric oxygen with the release of a large amount of energy.</p> <p>ii) Understand that respiration is a many-stepped process with each step controlled and catalysed by a specific intracellular enzyme.</p> <p>7.4 Understand the roles of glycolysis in aerobic and anaerobic respiration, including the phosphorylation of hexoses, the production of ATP, reduced coenzyme, pyruvate and lactate (details of intermediate stages and compounds are not required).</p>	<p>9. Core Practical – Measuring Respiration</p> <p>10. Anaerobic Respiration</p> <p>11. Aerobic Capacity</p> <p>12. Cardiac Output</p> <p>13. Control of a Single Heart Beat</p> <p>14. Control of Heart Rate</p> <p>15. Measuring Lung Volumes and Breathing Rate</p> <p>16. Control of Breathing Rate</p> <p>17. Adaptation</p>		<p>a) Uses appropriate software and/or tools to process data, carry out research and report findings.</p> <p>b) Cites sources of information demonstrating that research has taken place, supporting planning and conclusions.</p> <p>c) Numeracy and the application of mathematical concepts in a practical context</p> <ul style="list-style-type: none"> <li>• plot and interpret graphs</li> <li>• process and analyse data using appropriate mathematical</li> </ul>		<p><b>Homework 6:</b></p> <p>Exam questions on performance enhancing drugs.</p>



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	<p>7.5 Understand the role of the link reaction and the Krebs cycle in the complete oxidation of glucose and formation of carbon dioxide (CO<sub>2</sub>), ATP, reduced NAD and reduced FAD (names of other compounds are not required) and why these steps take place in the mitochondria, unlike glycolysis which occurs in the cytoplasm.</p> <p>7.6 Understand how ATP is synthesised by oxidative phosphorylation associated with the electron transport chain in mitochondria, including the role of chemiosmosis and ATP synthase.</p>	<p>18. Temperature Regulation</p> <p>19. Homeostasis</p> <p>20. Disadvantages of Exercising too Much</p> <p>21. Disadvantages of Exercising too Much of Too Little</p> <p>22. Performance-Enhancing Substances</p> <p>23. Performance-Enhancing Substances Part 2</p> <p>24. End of Unit Assessment</p>		<p>skills as exemplified in the mathematical appendix for each science</p> <ul style="list-style-type: none"> <li>• consider margins of error, accuracy and precision of data</li> </ul> <p>d) Instruments and equipment</p> <ul style="list-style-type: none"> <li>• know and understand how to use a wide range of experimental and practical instruments, equipment and techniques appropriate to the knowledge and understanding included in the specification.</li> </ul>		

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	<p>7.7 Understand what happens to lactate after a period of anaerobic respiration in animals.</p> <p>CORE PRACTICAL 16: Investigate rate of respiration.</p> <p>7.8 i) Know the myogenic nature of cardiac muscle. ii) Understand how the normal electrical activity of the heart coordinates the heart beat, including the roles of the sinoatrial node (SAN), the atrioventricular node (AVN), the bundle of His and the Purkyne fibres. iii) Understand how the use of electrocardiograms (ECGs) can aid the diagnosis of</p>					

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	<p>cardiovascular disease (CVD) and other heart conditions.</p> <p>7.9 i) Be able to calculate cardiac output. ii) Understand how variations in ventilation and cardiac output enable rapid delivery of oxygen to tissues and the removal of carbon dioxide from them, including how the heart rate and ventilation rate are controlled and the roles of the cardiovascular control centre and the ventilation centre in the medulla oblongata.</p> <p>CORE PRACTICAL 17: Investigate the effects of exercise on tidal volume, breathing</p>					

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	<p>rate, respiratory minute ventilation and oxygen consumption using data from spirometer traces.</p> <p>7.10 i) Know the structure of a muscle fibre. ii) Understand the structural and physiological differences between fast and slow twitch muscle fibres.</p> <p>7.11 i) Understand what is meant by negative feedback and positive feedback control. ii) Understand the principle of negative feedback in maintaining systems within narrow limits.</p> <p>7.12 Understand homeostasis and its importance in</p>					

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	<p>maintaining the body in a state of dynamic equilibrium during exercise, including the role of the hypothalamus and the mechanisms of thermoregulation.</p> <p>7.13 Understand the analysis and interpretation of data relating to possible disadvantages of exercising too much (wear and tear on joints, suppression of the immune system) and exercising too little (increased risk of obesity, cardiovascular disease (CVD) and diabetes), recognising correlation and causal relationships.</p> <p>7.14 Understand how medical technology, including the use of</p>					

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	<p>keyhole surgery and prostheses, is enabling those with injuries and disabilities to participate in sports.</p> <p>7.15 Be able to discuss different ethical positions relating to whether the use of performance-enhancing substances by athletes is acceptable.</p> <p>7.16 Understand how genes can be switched on and off by DNA transcription factors including hormones.</p>					
<b>Topic 8: Grey Matter</b>	8.1 Know the structure and function of sensory, relay and motor neurones including the role of Schwann cells and myelination.	<p>1. Introduction to the Topic</p> <p>2. Organisation of the Nervous System and Structure of Neurones</p>		A.1.11 Identify uncertainties in measurements and use simple techniques to determine uncertainty when	<p><b>Topic 4:</b></p> <p><b>Abstraction</b> the ability to move from concrete ideas about the brain/neurones to</p>	<p><b>TERM 4:</b></p> <p><b>Homework 1:</b></p> <p>Active learn end of topic task assessment for Topic</p>

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	<p>8.2 i) Understand how the nervous systems of organisms can cause effectors to respond to a stimulus. ii) Understand how the pupil dilates and contracts.</p> <p>8.3 Understand how a nerve impulse (action potential) is conducted along an axon including changes in membrane permeability to sodium and potassium ions and the role of the myelination in saltatory conduction.</p> <p>8.4 Know the structure and function of synapses in nerve impulse transmission, including the role of neurotransmitters,</p>	<p>3. Reflex Arcs</p> <p>4. The Action Potential</p> <p>5. The Action Potential Part 2</p> <p>6. Conduction of the Impulse</p> <p>7. Synapses</p> <p>8. Nervous System and Hormonal Coordination</p> <p>9. Nervous System and Hormonal Coordination Part 2</p> <p>10. Detecting Stimuli</p> <p>11. Plants Detect Stimuli</p> <p>12. Regions of the Brain</p>		<p>data are combined</p> <p>A.1.10 Understand measures of dispersion, including standard deviation and range</p> <p>A.1.9 Select and use a statistical test</p> <p>A.1.8 Make order of magnitude calculations</p> <p>A.1.7 Use a scatter diagram to identify a correlation between two variables</p> <p>a) Independent thinking</p>	<p>abstract concepts related to their function.</p> <p><b>Automaticity:</b> use of techniques such as dual coding to ensure that students are able to recall complicated concepts such as the way we see and the interaction of neurones in the visual cortex.</p> <p><b>Confident:</b> recognise the need to take current models of understanding learning/thought and change them based on the learning that they are presented with during these lessons.</p>	<p>7 and prior knowledge task for Topic 8.</p> <p><b>Homework 2:</b></p> <p>Exam questions on reflex arc and action potential.</p> <p><b>Homework 3:</b></p> <p>Exam questions on the nervous system and hormonal control.</p> <p><b>Homework 4:</b></p> <p>Exam questions on visual development.</p> <p><b>Homework 5:</b></p> <p>Core Practical write-up on habituation.</p> <p><b>Homework 6:</b></p> <p>Revision for the Topic 8 Assessment.</p> <p><b>Homework 7:</b></p>

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	<p>including acetylcholine.</p> <p>8.5 Understand how the nervous systems of organisms can detect stimuli with reference to rods in the retina of mammals, the roles of rhodopsin, opsin, retinal, sodium ions, cation channels and hyperpolarisation of rod cells in forming action potentials in the optic neurones.</p> <p>8.6 Understand how phytochrome and IAA bring about responses in plants to environmental cues, including their effects on transcription.</p> <p>8.7 Understand how co-ordination is brought about through nervous and</p>	<p>13. Regions of the Brain Part 2</p> <p>14. Critical Period of Visual Development</p> <p>15. Visual Perception</p> <p>16. Learning and Memory</p> <p>17. Learning</p> <p>18. The Role of Animal Models</p> <p>19. The Role of Animal Models Part 2</p> <p>20. Nature or Nurture?</p> <p>21. Effect of Chemical on Synapses</p> <p>22. Effect of Chemicals on Synapses Part 2</p>		<ul style="list-style-type: none"> <li>• apply investigative approaches and methods to practical work</li> <li>b) Use and apply scientific methods and practices</li> <li>• safely and correctly use a range of practical equipment and materials</li> <li>• follow written instructions</li> <li>• make and record observations</li> <li>• keep appropriate records of experimental activities</li> </ul>		<p>Revision for the synoptic PPE Paper 3.</p> <p><b>TERM 5:</b> From this point students will be given structured revision in preparation for their real GCSE examinations,</p>



Unit:	Core knowledge/skill development:	Sequence:	Assessment:	Literacy, numeracy, PSHE, FBV, other links	ACP and VAA development:	Home learning and enrichment
	<p>hormonal control in animals.</p> <p>8.8 Know the location and functions of the cerebral hemispheres, hypothalamus, cerebellum and medulla oblongata in the human brain.</p> <p>8.9 Understand how magnetic resonance imaging (MRI), functional magnetic resonance imaging (fMRI), positron emission tomography (PET) and computed tomography (CT) scans are used in medical diagnosis and the investigation of brain structure and function.</p> <p>8.10 Understand what happens during the critical period so that</p>	<p>23. Genome Sequencing Projects</p> <p>25. GM Organisms</p> <p>25. End of Unit Assessment</p>		<ul style="list-style-type: none"> <li>• present information and data in a scientific way</li> <li>• use appropriate software and tools to process data, carry out research and report findings</li> </ul> <p>c) Research and referencing</p> <ul style="list-style-type: none"> <li>• use online and offline research skills including websites, textbooks and other printed scientific sources of information</li> <li>• correctly cite sources of information</li> </ul> <p>d) Instruments and equipment</p>		

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	<p>mammals can develop their visual capacities to the full.</p> <p>8.11 Understand the role animal models have played in the research into human brain development and function, including Hubel and Wiesel's experiments with monkeys and kittens.</p> <p>8.12 Be able to discuss moral and ethical issues relating to the use of animals in medical research from two ethical standpoints.</p> <p>8.13 Understand how animals, including humans, can learn by habituation.</p> <p>CORE PRACTICAL 18: Investigate</p>			<ul style="list-style-type: none"> <li>• use a wide range of experimental and practical instruments, equipment and techniques appropriate to the knowledge and understanding included in the specification.</li> </ul>		

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	<p>habituation to a stimulus.</p> <p>8.14 Understand how imbalances in certain, naturally occurring brain chemicals can contribute to ill health, including dopamine in Parkinson's disease and serotonin in depression, and to the development of new drugs.</p> <p>8.15 Understand the effects of drugs on synaptic transmissions, including the use of L-Dopa in the treatment of Parkinson's disease and the action of MDMA in Ecstasy.</p> <p>8.16 Understand how the outcomes of genome sequencing</p>					

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	<p>projects are being used in the development of personalised medicine and the social, moral and ethical issues this raises.</p> <p>8.17 Know how drugs can be produced using genetically modified organisms (plants, animals and microorganisms).</p> <p>8.18 Understand the risks and benefits associated with the use of genetically modified organisms.</p> <p>8.19 Understand the methods used to investigate the contributions of nature and nurture to brain development, including evidence from the abilities of</p>					

Unit:	Core knowledge/skill development:	Sequence:	Assessment:	Literacy, numeracy, PSHE, FBV, other links	ACP and VAA development:	Home learning and enrichment
	new-born babies, animal experiments, studies of individuals with damaged brain areas, twin studies and cross-cultural studies.					