


Year 10 Triple Science Curriculum Plan

Biology


| | Key concept/ Key question | Overview of the unit | Assessment | Cross Curricular Skills | Suggested reading material and websites: |
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| Biology 3 | <p>How are living things organised?</p> <p>How does the digestive system work?</p> <p>What are enzymes?</p> | <p>Building on Y9 work on cells the unit looks at tissues, organs and organ systems – focusing on the human digestive system.</p> <p>Protein structure is introduced in the context of enzyme function.</p> <p>Factors which effect enzyme function are considered then linked back into enzymes in the digestive system.</p> | <p>Assessment is based around end of topic tests – typically around 55 min. at the end of each unit.</p> <p>These tests contain a mixture of recall and application questions based on the current topic.</p> <p>Towards the end of the year students will sit papers in biology, chemistry and physics. This is to begin to prepare students for the linear exam based terminal assessment they will encounter at GCSE.</p> | <p>Numeracy: Calculation of rates of reaction. Plotting graphs.</p> <p>Thinking Skills: Use and evaluation of models (lock and key for enzymes)</p> | <p>Students are following the AQA science specifications.</p> <p>http://www.aqa.org.uk/subjects/science/gcse</p> <p>All students have access to Kerboodle which contains a digital copy of the biology, chemistry and physics textbooks used at KS4</p>  <p>https://www.kerboodle.com/users/login</p> <p>A number of KS4 revision guides and student workbooks are available such as those from CPG and these can be helpful in supporting student learning. As this is a new specification many resources are still being developed.</p> <p>https://www.cgpbooks.co.uk/</p> |
| Biology 4 | <p>How are transport systems organised in animals and plants?</p> | <p>Structure and function of blood.</p> <p>The human circulatory and gas exchange systems. Relating structure to function.</p> | | <p>Literacy: Extracting information from complex texts – subject specific vocabulary.</p> <p>Numeracy: Data interpretation, calculating % change, rate of gas/water</p> | |

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| | <p>What is a communicable disease?</p> <p>How can you grow pathogens?</p> | <p>Diseases of the heart and treatments.</p> <p>Plant organs (leaf, root, stem) – mass transport system in plants. Role of specialised tissues in plants.</p> <p>What is a pathogen?</p> <p>Bacterial growth conditions – aseptic technique.</p> <p>What diseases are caused by viruses and bacterial?</p> | <p>Working grades will be reported as a running average showing how students have been performing in all assessments thus far.</p> <p>Individual grades will be reported for each of the sciences</p> | <p>uptake. Growth curves of bacteria.</p> <p>Thinking Skills: Cause and correlation. Evaluating the strength of scientific evidence. Recognising questions relating to relative values and importance that science can't answer directly.</p> | <p>Useful websites to support learning.</p> <p>BBC KS4 science</p> <p>http://www.bbc.co.uk/education/subjects/zrkw2hv</p> <p>Please note this material is no longer exam board specific.</p> |
| Biology 5 | <p>Plant pathogens</p> <p>How can communicable disease be prevented?</p> <p>What are non-communicable diseases?</p> <p>What are monoclonal antibodies?</p> | <p>Role of medicine – antibiotics, vaccination</p> <p>Drug discovery</p> <p>Cancer</p> <p>Disease linked to lifestyle choices (smoking, alcohol, exercise).</p> <p>How are monoclonal antibodies made</p> | <p>Literacy: Reading to extract information – historical accounts of drug discovery</p> <p>Numeracy: Disease data</p> <p>Thinking Skills: Ethical issues, considering how different people can come to different conclusions when presented with the same choices or information (vaccination).</p> | | |

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| Biology 6 | <p>What is photosynthesis?</p> <p>How do plants use glucose?</p> | | | <p>Literacy: reading complex articles on agriculture and optimising photosynthesis to increase yield.</p> <p>Numeracy: Graph plotting, calculation of rates and identification of limiting factors.</p> <p>Thinking Skills: Experimental design, fair testing and controlling variables</p> | |
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Chemistry

| | Key concept/ Key question | Overview of the unit | Assessment | Cross Curricular Skills | Suggested reading material and websites: |
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| Chemistry 3 | <p>Structure and bonding in chemistry.</p> <p>What are nanoparticles?</p> | <p>Ionic, covalent and metallic bonding.</p> <p>Giant structures</p> <p>Fullerenes and graphene</p> <p>Development of nanoscale chemistry and its implications.</p> | <p>Assessment is based around end of topic tests – typically around 55 min. at the end of each unit.</p> <p>These tests contain a mixture of recall and application questions based on the current topic.</p> | <p>Literacy: reading newspaper/scientific articles to extract evidence and draw balanced conclusions.</p> <p>Numeracy: scale, nanometre conversions</p> <p>Thinking Skills: Implications of new technology. Ideas around benefit and risk.</p> | <p>Students are following the AQA science specifications.</p> <p>http://www.aqa.org.uk/subjects/science/gcse</p> <p>All students have access to Kerboodle which contains a digital copy of the biology, chemistry and physics textbooks used at KS4</p> |

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| | | | Towards the end of the year students will sit papers in biology, chemistry and physics. This is to begin to prepare students for the linear exam based terminal assessment they will encounter at GCSE. | |  <p>https://www.kerboodle.com/users/login</p> <p>A number of KS4 revision guides and student workbooks are available such as those from CPG and these can be helpful in supporting student learning. As this is a new specification many resources are still being developed.</p> <p>https://www.cgpbooks.co.uk/</p> <p>Useful websites to support learning.</p> <p>BBC KS4 science</p> <p>http://www.bbc.co.uk/education/subjects/zrkw2hv</p> <p>Please note this material is no longer exam board specific.</p> |
| Chemistry 4 | Chemical calculations Chemical changes | Calculation of relative atomic mass. Yield of chemical reactions and atom economy. Titrations Reactivity series Displacement reactions Acids and salts | Working grades will be reported as a running average showing how students have been performing in all assessments thus far. Individual grades will be reported for each of the sciences | Literacy: Scientific vocabulary associated with scientific method (accuracy, concordant etc). Numeracy: Chemical calculations, rearranging formula. Ratios Thinking Skills: Interpreting experimental data – reactivity series. | |

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| <p>Chemistry 5</p> | <p>What is electrolysis?</p> | <p>Principles of electrolysis Extraction of aluminium</p> | | <p>Literacy: Writing equations and half equations. Accuracy and presentation of scientific formula.</p> <p>Numeracy: Balancing equations and half equations.</p> <p>Thinking Skills: Synoptic links to earlier work on structure and bonding and the formation of ions.</p> | |
| <p>Chemistry 6</p> | <p>What energy changes occur in chemical reactions?</p> <p>How do batteries work?</p> <p>How do we obtain fuel from crude oil?</p> | <p>Exothermic and endothermic reactions. Bond energy calculations Batteries and fuel cells Hydrocarbons and the fractional distillation of crude oil. Cracking crude oil to make more useful products.</p> | | <p>Literacy: Subject specific vocabulary.</p> <p>Numeracy: Bond energy calculations.</p> <p>Thinking Skills: Conflicting pressures from society – oil extraction against environmental concerns.</p> | |

Physics

| | Key concept/ Key question | Overview of the unit | Assessment | Cross Curricular Skills | Suggested reading material and websites: |
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| Physics 3 | <p>What is energy?</p> <p>How can we model how energy behaves and quantify energy mathematically?</p> <p>How is thermal energy transferred?</p> | <p>The energy store and energy transfer model.</p> <p>Calculation of energy stores (potential, kinetic, elastic).</p> <p>Efficiency of energy transfer and power.</p> <p>Energy transfer by conduction and radiation.</p> <p>Infrared – black body radiation.</p> <p>Insulation of homes as an example of controlling heat transfer.</p> | <p>Assessment is based around end of topic tests – typically around 55 min. at the end of each unit.</p> <p>These tests contain a mixture of recall and application questions based on the current topic.</p> <p>Towards the end of the year students will sit papers in biology, chemistry and physics. This is to begin to prepare students for the linear exam based terminal assessment they will encounter at GCSE.</p> | <p>Literacy: Extracting mathematical information from written texts – selecting appropriate equations.</p> <p>Numeracy: Range of calculations to learn and apply. Conversion of units.</p> <p>Thinking Skills: How scientists use models even if the models are limited.</p> | <p>Students are following the AQA science specifications. http://www.aqa.org.uk/subjects/science/gcse</p> <p>All students have access to Kerboodle which contains a digital copy of the biology, chemistry and physics textbooks used at KS4</p>  <p>https://www.kerboodle.com/users/login</p> <p>A number of KS4 revision guides and student workbooks are available such as those from CPG and these can be helpful in supporting student learning. As this is a new specification many resources are still being developed.</p> <p>https://www.cgpbooks.co.uk/</p> <p>Useful websites to support learning.</p> |
| Physics 4 | <p>What sources of energy are used to generate electricity?</p> | <p>Renewable and non-renewable energy resources.</p> <p>Trends in energy usage.</p> | <p>Working grades will be reported as a running average</p> | <p>Literacy: Study of information on energy supply and demand. Considering bias in information (oil industry/environmental groups).</p> <p>Numeracy: Calculations of voltage/current and resistance.</p> | |

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| | <p>What is electricity?</p> <p>How does electricity behave in circuits?</p> | <p>Issues underlying all energy choices.</p> <p>Static: electric charges and fields.</p> <p>The relationship between voltage, current and resistance.</p> | <p>showing how students have been performing in all assessments thus far.</p> <p>Individual grades will be reported for each of the sciences</p> | <p>Thinking Skills: Use of models.</p> | <p>BBC KS4 science</p> <p>http://www.bbc.co.uk/education/subjects/zrkw2hv</p> <p>Please note this material is no longer exam board specific.</p> |
| <p>Physics 5</p> | <p>How is electricity used in the home?</p> <p>Extending the particle model of matter.</p> | <p>Alternating current, electrical supply and appliances.</p> <p>Relationship between current, power and voltage</p> <p>Density and change of state. Internal energy and pressure. Latent heat.</p> | | <p>Literacy: Scientific vocabulary</p> <p>Numeracy: Power equations and efficiency. Density equations.</p> <p>Thinking Skills: Models – Brownian motion. Abstract concepts.</p> | |

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| <p>Physics 6</p> | <p>What is radioactivity and how do we use it?</p> <p>What is a force? How do you calculate the effect of a force?</p> <p>(Both of these topics were taught in Y9 – will be taught as revision/recap in shorter time in this unit).</p> | <p>Discovery of radioactivity?</p> <p>Types of radiation</p> <p>Balancing forces and resultant forces.</p> <p>Resolving forces.</p> <p>Moments</p> | | <p>Literacy: Scientific vocabulary</p> <p>Numeracy: Decay curves, calculation of half-life. Calculation of moments.</p> <p>Thinking Skills: Risk versus benefits. Issues for society (use of radiation)</p> | |
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