

Archbishop Beck Catholic College Long Term Plan for BTEC Applied Science

Year 12 Applied Science

Autumn Half Term 1	Half Term 2	Key Vocabulary/Reading Opportunities
<p>Topic Areas to be covered:</p> <p><b>Teacher A</b> Structure and bonding in applications of science</p> <p><b>Teacher B</b> Cell structure and function, cell specialisation</p> <p><b><u>AP1 Assessment</u></b></p>	<p>Topic Areas to be covered:</p> <p><b>Teacher A</b> Production and uses of substances in relation to properties, working with waves</p> <p><b>Teacher B</b> Tissue structure and function, use of electromagnetic waves in communication</p> <p><b><u>AP 2 Assessment</u></b></p>	<p>Electron configuration, orbital, lattice, ionic bonding, covalent bonding, metallic bonding, electrostatic attraction, intermolecular forces, polar, electronegativity, molarity, empirical formula, mole, yield, atomic radius, ionic radius, periodicity, electron affinity, reactivity, oxidation, reduction, cell theory, prokaryotic, eukaryotic, magnification, microscopy, membrane, nucleus, DNA, RNA, Gram staining, specialisation, water potential, epithelial, endothelial, muscle, nervous, neuron, synapse, genetic.</p>
Spring Half Term 3	Half Term 4	Key Vocabulary/Reading Opportunities
<p><b>Teacher A</b> Working with waves, waves in communication</p> <p><b>Teacher B</b> Use of electromagnetic waves in communication</p> <p><b><u>External Examination</u></b></p>	<p><b>Teacher A</b> Titration and colorimetry to determine concentration of solutions</p> <p><b>Teacher B</b> Calorimetry to study cooling curves</p> <p><b><u>AP3 Assessment</u></b></p>	<p>Oscillation, frequency, period, amplitude, transverse, longitudinal, wavelength, phase difference, diffraction, interference, superposition, reflection, refraction, emission spectra, stationary wave, harmonic, total internal reflection, critical angle, optical fibre, analogue, digital, electromagnetic spectrum, inverse square. Titration, concentration, concordant, calibration, quantitative, standard, pH, equivalence, colorimetry, absorption, cuvette, absorbance, Beer-Lambert law.</p>
Summer Half Term 5	Half Term 6	Key Vocabulary/Reading Opportunities
<p><b>Teacher A</b> Titration and colorimetry to determine concentration of solution.</p> <p><b>Teacher B</b> Calorimetry to study cooling curves</p>	<p><b>Teacher A</b> Chromatographic techniques to identify components in mixtures</p> <p><b>Tecaher B</b> Chromatographic techniques to identify components in mixtures</p>	<p>Thermometer, cooling curve, boiling point, melting point, latent heat, super cooling, intermolecular forces, chromatography, mobile phase, stationary phase, TLC, Rf value, immiscible, gas-liquid chromatography, ion exchange chromatography, solubility, mobility,</p>

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Wider learning experiences to support this A Level	Learning Characteristics instilled in the curriculum	Career Opportunities
<ul style="list-style-type: none"> <li>• Science lab visits</li> <li>• Volunteering opportunities</li> <li>• Study skills visit</li> <li>• Revision guides provided</li> </ul>	<p><b>Confidence</b> Use of consolidations to revisit prior learning and allow to students to feel open to making mistakes. Encourage discussion of mistakes and praise those who offer up incorrect solutions/alternate methods for discussion.</p> <p><b>Positive</b> High expectations in presentation of exercise books and weekly homework.</p> <p><b>Resilience</b> Learners are challenged from the word go with high expectations of presentation and work ethic. Independent tasks, reading, researching, assessment tasks, mind maps.</p>	<ul style="list-style-type: none"> <li>• Science careers week</li> <li>• Work experience</li> <li>• University visits</li> <li>• Volunteering</li> <li>• Absolute Chemistry Outreach programme.</li> </ul>

### Metacognition Methods applied in Teaching

- Consolidation exercise at the beginning of every lesson to revisit prior learning.
- Give sufficient thinking time during discussions.
- Split topics into appropriate chunks depending on student ability to reduce cognitive overload.
- Variation of teaching styles
- Discussion of solutions and the various approaches to problems to find the most efficient method.
- Modelling of extended questions
- Valiant vocabulary highlighted in notes and through exam mark schemes and consolidation tasks.
- Independent learning tasks.

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<p><b>Teacher A</b> Review personal development of scientific skills for laboratory work</p> <p><b>Teacher B</b> Musculoskeletal disorders and corrective treatment</p> <p><b>AP1 Assessment</b></p>	<p><b>Teacher A</b> Planning scientific investigations, data collection.</p> <p><b>Teacher B</b> Lymphatic system disorders and corrective treatment</p> <p><b>AP2 Assessment</b></p>	<p>Personal responsibility, interpersonal skills, competence, hypothesis, null hypothesis, variables, accuracy, precision, axial skeleton, appendicular skeleton, compact and spongy bones, joints, ligaments, tendons, muscle groups, slow and fast twitch fibres, contraction, arthritis, trauma, lymph, lymph vessels, lymphocytes, lymphadenitis, Hodgkin's lymphoma.</p>
Spring Half Term 3	Half Term 4	Key Vocabulary/Reading Opportunities
<p><b>Teacher A</b> Data processing, analysis and interpretation</p> <p><b>Teacher B</b> Physiology of the digestive system and corrective treatment</p> <p><b>External Papers</b></p>	<p><b>Teacher A</b> Drawing conclusions and evaluation, diffusion of molecules</p> <p><b>Teacher B</b> Enzymes in Action, plants and their environment</p> <p><b>AP3 Assessment</b></p>	<p>Mean, standard deviation, normal distribution, t-test, chi-squared test, correlation, percentage error, charts and graphs, evaluation, reliability. Peptide link, amino acids, active sites, collision theory, substrate, fermentation, kinetic theory, dynamic equilibrium, limiting factor, sampling technique, transects, quadrats.</p>
Summer Half Term 5	Half Term 6	Key Vocabulary/Reading Opportunities
<p><b>Teacher A</b> Energy content of fuels, revision for external paper</p> <p><b>Teacher B</b> Electrical circuits, revision for external paper</p>	<p><b>Teacher A and B</b> Consolidation of all topics from both Year 1 and 2 to support exam success.</p> <p><b>External Papers</b></p>	<p>Fuel, crude oil, alkane, fractional distillation, alcohols, flammability, incomplete combustion, bond energies, circuit symbols, Ohm's Law, series, parallel, power, fuses, efficiency.</p>

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Metacognition Methods applied in Teaching
<ul style="list-style-type: none"> <li>• Consolidation exercise at the beginning of every lesson to revisit prior learning.</li> <li>• Give sufficient thinking time during discussions.</li> <li>• Split topics into appropriate chunks depending on student ability to reduce cognitive overload.</li> <li>• Variation of teaching styles</li> <li>• Discussion of solutions and the various approaches to problems to find the most efficient method.</li> <li>• Modelling of extended questions</li> <li>• Valiant vocabulary highlighted in notes and through exam mark schemes and consolidation tasks.</li> <li>• Independent learning tasks.</li> </ul>