

# PHYSICS

| Year 12       |   |                                    |   |   |  |  |
|---------------|---|------------------------------------|---|---|--|--|
| When          | <b>WHAT &amp; WHY WILL THEY LEARN?</b><br>(SOW overview linked to assessment Objectives)<br>What do Yr12/13 need to know and be able to do by the time they leave TENC? How do you sequence the teaching? How do you revisit, revise and reinforce? |                                    | <b>New Skill = NS</b><br><b>Revisit = R</b><br><b>Revision = RV</b> | <b><u>Stretch and Challenge</u></b><br>(Differentiation – how will you stretch the most able to achieve top grades?)<br>Is your curriculum challenging? | <b><u>CIEAG/Extension</u></b><br><br><b><u>Enrichment</u></b><br>Trips, workshops, speakers, local environment and experiences | <b><u>KS4 PRIOR LEARNING</u></b><br><br>How will GCSE knowledge, skills & experience across 3 schools link to and support KS5 new knowledge and skills? This needs to show how you build links across the experiences of the different schools |
| Term Plan     | <b><u>KNOWLEDGE &amp; SKILLS</u></b>  | <b><u>Assessment Objective</u></b> |   |   |  |  |
|               | <b><u>Transition Task</u></b><br>Checks:<br>Maths skills<br>GCSE Knowledge<br>Challenges through extension  | AO1<br>AO2<br>AO3                  | R   | Requires practise of maths skills required for A level Physics.   |  | Checks that all students have a suitable grasp of the GCSE standard knowledge of Physics to progress.<br>Checks ability to perform mathematical procedures.  |
| <b>Term 1</b> | <b>Measurement and their errors.</b><br>Calculate uncertainties in reading and calculations   | AO1<br>AO2<br>AO3                  | R<br>NS   | Use of exampro to use A level standard questions not just AS<br><br>Independent working in practical's, have to read and follow                         |  | Mathematical ability<br><br>Use of Si units and conversions  |

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|  | <p><b>Particles and radiation</b><br/>         Constituents of the atom, Stable and unstable nuclei, Particles, antiparticles and photons, Particle interactions, Classification of particles, Quarks and antiquarks, Applications of conservation laws, The photoelectric effect.</p> <p><b>Electricity</b><br/>         Basics of electricity, Current-voltage characteristics, Resistivity, Circuits,</p> |  | <p>NS</p> <p>R/ NS</p> | <p>written instructions without teacher support.</p> <p>Development of lab book skills.</p> |  | <p>Knowledge of radioactivity</p> <p>Electricity topic at GCSE</p> |
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|               | Potential divider,<br>Electromotive force<br>and internal<br>resistance.  |                   |                              |   |  |                       |
| <b>Term 2</b> | <p><b>Particles and radiation Cont.</b><br/>Wave particle duality/ Energy Levels/ photon emission/ Collisions of electrons with atoms</p> <p><b>Waves Progressive</b><br/>waves, Longitudinal and transverse waves, Principle of superposition of waves and formation of stationary waves, Refraction, diffraction and interference, Diffraction,</p> | AO1<br>AO2<br>AO3 | NS<br><br>NS/ R<br><br>NS/ R | <p>Independent working in practical's, have to read and follow written instructions without teacher support.</p> <p>Development of lab book skills.</p> <p>Use of A level past paper questions.</p> |  | Waves topic from GCSE |

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|               | <p>Refraction at a plane surface.</p> <p><b>Mechanics</b><br/>Scalars and vectors, Moments, Motion along a straight line, Projectile motion, Newton's laws of motion, Momentum, Work, energy and power, Conservation of energy.</p> | NS/ R             |                   |   |  | Forces and Energy Topics from GCSE |
| <b>Term 3</b> | <p><b>Mechanics</b><br/>(cont.)</p> <p><b>Materials</b><br/>Bulk properties of solids, The Young modulus.</p> <p><b>Revision for end of Year exam</b></p>   | AO1<br>AO2<br>AO3 | R<br>NS<br><br>RV | <p>Independent working in practical's, have to read and follow written instructions without teacher support.</p> <p>Development of lab book skills.</p> |  |                                    |

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|  | <p><b>Further Mechanics</b></p> <p>Circular motion,<br/>Simple harmonic motion (SHM),<br/>Simple harmonic systems, Forced vibrations and resonance.</p> <p><b>Thermal physics</b></p> <p>Thermal energy transfer<br/>, Ideal gases,<br/>Molecular kinetic theory model.</p> |  | NS | Use of A level past paper questions. |  |  |
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| Year 13       |  |   |   |  |  |  |
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| When          | <b>WHAT &amp; WHY WILL THEY LEARN?</b><br>(SOW overview linked to assessment Objectives)                             | <b>New Skill = NS</b><br><b>Revisit = R</b><br><b>Revision = RV</b> | <b><u>Stretch and Challenge</u></b><br><b>(Differentiation – how will you stretch the most able to achieve top grades?)</b> | <b><u>CIEAG/Extension</u></b><br><br>Trips, workshops, speakers, local environment and experiences | <b><u>KS4 PRIOR LEARNING</u></b><br><br>How will GCSE knowledge support new skills & knowledge |  |
| Term Plan     | <b><u>KNOWLEDGE &amp; SKILLS</u></b>   | <b>Assessment Objective</b>   |   | <b>Band 5 = Informed</b><br><b>Band 6 = Mature</b>   |  |  |
| <b>Term 1</b> | <b>Thermal Physics</b><br>(cont.)<br><br><b>Fields</b><br><b>Gravitational fields</b><br>Newton's law, Gravitational | AO1<br>AO2<br>AO3   | NS  | Independent working in practical's, have to read and follow written instructions without           |  |  |

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|  | <p>field strength, Gravitational potential, Orbits of planets and satellites,</p> <p><b>Electric fields</b><br/>Coulomb's law and Electric field strength, Electric potential, Capacitance, Parallel plate capacitor and Energy stored by a capacitor , Capacitor charge and discharge.</p> <p><b>Magnetic fields</b><br/>Magnetic flux density, Moving charges in a magnetic field, Magnetic flux and flux linkage,</p> |  | <p>NS</p> <p>NS</p> | <p>teacher support.</p> <p>Development of lab book skills.</p> <p>Use of A level past paper questions.</p> |  | <p>Aspects of electricity topic</p> <p>Magnetism work done at K3 and 4</p> |  |
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|  | <p>Electromagnetic induction, Alternating currents, The operation of a transformer.</p> <p><b>Radioactivity</b><br/>Rutherford scattering, <math>\alpha</math>, <math>\beta</math> and <math>\gamma</math> radiation, Radioactive decay, Nuclear instability, Nuclear radius, Mass and energy, Induced fission, Safety aspects.</p> <p><b>Revision for Mock exam</b></p> |  | NS |  |  | GCSE Radioactivity topic |  |
|  |  |  | R  |  |  |                          |  |



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| <b>Term 2</b> | <p><b>Radioactivity topic (cont)</b></p> <p>Optional Topic</p> <p><b>Astronomy</b></p> <p><b>Telescopes</b></p> | <p>AO1</p> <p>AO2</p> <p>AO3</p> | <p>NS</p> <p>NS</p> | <p>Independent working in practical's, have to read and follow written instructions without teacher support.</p> <p>Development of lab book skills.</p> <p>Use of A level past paper questions.</p> |  |  |  |

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| <p>Astronomical telescope consisting of two converging lenses and Reflecting telescope, Single dish radio telescopes, U-V, I-R, and X-ray telescopes, and Advantages of large diameter telescopes</p> <p>Single dish radio telescopes, U-V, I-R, and X-ray telescopes, and Advantages of large diameter telescopes.</p> <p><b>Classification of Stars</b><br/>Classification by luminosity and Absolute magnitude, M.,<br/>Classification by temperature,</p> |  |  |  |  |  |  |
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|               | <p>black-body radiation and Principles of the use of stellar spectral, The Hertzsprung-Russell (HR) diagram, Supernovae, neutron stars and black holes.</p> <p><b>Cosmology</b><br/>Doppler effect and Hubble's law, Quasars and Detection of exoplanets.</p> |                            |           |  |  |  |  |
| <b>Term 3</b> | <p>Finish off any incomplete assessed practicals.</p> <p>Review mock exams.</p>   | <p>AO1<br/>AO2<br/>AO3</p> | <p>RV</p> |  |  |  |  |

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|  | Prepare for final exam |  |  |  |  |  |  |
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