

UTC KS5 Physics Learning Cycles 2019 – Year 13

Cycle 2.6 Simple Harmonic Motion Thermal Physics	Cycle 2.7 Fields and their consequences	Cycle 2.8 Nuclear Physics	Cycle 2.9 Option: Astrophysics	Cycle 2.10 Revision of Topics 1 – 9 and required practicals
<p style="text-align: center;">Topics</p> <ul style="list-style-type: none"> • Simple Harmonic Motion • Free and Forced Oscillations • Resonance • Simple harmonic systems • Required Practical 7 • Specific Heat Capacity • Specific Latent Heat • Ideal Gases • Required Practical 8 • Molecular Kinetic Theory • Newton’s Law of Gravitation • Gravitational Field Strength • Gravitational Potential • Orbits 	<p style="text-align: center;">Topics</p> <ul style="list-style-type: none"> • Coulomb’s Law • Electric Field Strength • Electric Potential • Capacitance • Parallel Plate Capacitors • Energy Stored in a capacitor • Charging and Discharging a Capacitor • Required Practical 9 • Magnetic Flux Density • Required Practical 10 • Moving Charges in a magnetic field • Flux Linkage • Required Practical 11 • Electromagnetic Induction • Alternating Currents • Transformers 	<p style="text-align: center;">Topics</p> <ul style="list-style-type: none"> • Rutherford Scattering • Alpha, beta and Gamma • Background radiation • Risk benefit • Required Practical 12 • Radioactive Decay • Nuclear Stability • Technetium-99m • Nucleus Radius • Mass Defect • Fusion/Fission • Induced Fission • Reactor Safety 	<p style="text-align: center;">Topics</p> <ul style="list-style-type: none"> • Ray Diagrams • Angular Magnification • Reflecting Telescopes • Non optical Telescopes • Rayleigh Criterion • CCDs • Apparent Magnification • Absolute Magnitude • Black Body Radiation • Wein’s Law • Stefan’s Law • Spectral Classification • H-R Diagrams • Supernova, neutron stars and Black Holes • Hubble’s Law • Quasars • Exoplanets 	<p style="text-align: center;">Topics</p> <ul style="list-style-type: none"> • Measurement, Errors and Mechanics • Mechanics and Materials • Electricity • Waves • Atoms • Particles and Radiation • Periodic motion • Simple Harmonic Motion • Thermal Physics • Fields and their consequences • Nuclear Physics • Option: Astrophysics/ Medical Physics
<p style="text-align: center;">Keywords</p> <p>uniform circular motion, angular displacement, angular speed, centripetal acceleration, centripetal force equilibrium, free vibrations, angular frequency, phase difference, simple harmonic motion, mass-spring system, pendulum, critical damping, resonance, periodic force thermal equilibrium, Celsius scale, absolute scale, absolute zero, specific heat capacity, latent heat of fusion, latent heat of vaporisation, sublimation, Boyle’s Law, Charles’ Law, Pressure Law, Brownian motion, Avogadro, molarity, ideal gas, Boltzmann, root-mean-square</p>	<p style="text-align: center;">Keywords</p> <p>radial field, uniform field, potential energy, potential, equipotential, potential gradient, field strength, Kepler, escape velocity, geostationary/polar satellite, gold leaf electroscope, capacitance, time constant, dielectric, relative permittivity, polarisation, Fleming’s left-hand rule, electromagnetic induction, dynamo rule, Lenz, Faraday, flux linkage, back emf, eddy current</p>	<p style="text-align: center;">Keywords</p> <p>Alpha/beta/gamma radiation, Rutherford, photon, count rate, ionisation, positron, intensity, nuclide, dose equivalent, background radiation, decay curve, half-life, activity, decay constant, strong nuclear force, excited/metastable/ground state, de Broglie wavelength, annihilation, pair production, electron capture, binding energy, mass defect, induced fission, chain reaction, heat exchanger, control rods, moderator, reactor core, coolant, critical mass, high, intermediate and low-level nuclear waste</p>	<p style="text-align: center;">Keywords</p> <p>Astrophysics: Absolute magnitude, Cassegrain telescope, spherical/chromatic aberration, parsec, parallax angle, Hubble, Hertzsprung-Russell diagram</p> <p>Medical: Decibel scale, electrocardiogram, ultrasound, endoscope, magnetic resonance imaging, frequency response, dioptre, hypermetropia, myopia, acoustic impedance, attenuation, collimator</p>	<p style="text-align: center;">Keywords</p> <p>See previous topics</p>
<p style="text-align: center;">Topic Assessments Used</p> <p>End of Module Test: Exampro</p>	<p style="text-align: center;">Topic Assessments Used</p> <p>End of Module Test: Exampro</p>	<p style="text-align: center;">Topic Assessments Used</p> <p>End of Module Test: Exampro</p>	<p style="text-align: center;">Topic Assessments Used</p> <p>End of Module Test: Exampro</p>	<p style="text-align: center;">Topic Assessments Used</p> <p>Past Papers</p>