

Revision Checklist for Work Covered Up To Year 13 October Trial Exams

Work covered in Autumn of year 12

Topic to be revised	R	A	G	Comments
Mechanics				
Recall scalar and vector quantities; Recall base units; Convert between base and derived units				
Add two vectors at any angle using tip to toe; Add two vectors at right angles using Pythagoras and trig				
Resolve a vector into horizontal and vertical components.				
Draw and interpret distance-time and velocity-time graphs; Add a gradient to a curved line and work out its gradient				
Use the equations of motion SUVAT in one dimension				
Recognise independence of vertical and horizontal motion; Use SUVAT to solve complex problems in 2 dimensions (+2 hours if needed)				
Draw a free body diagram, work out position of centre of gravity, use $w = mg$				
Recall and use Newton 1 and 2, using $F = ma$				
Recall, use and list conditions for Newton 3 force pairs				
Use conservation of momentum concepts to solve problems (+2 hours if needed)				
Calculate kinetic energy for moving objects; Calculate GP Energy of an object				
Work done as a transfer of energy with $W = F s$				
Calculate power; Apply conservation of energy				
Moments				
Materials				
Define and use the words density, laminar, streamline and turbulent				

flow, terminal velocity, upthrust, viscous drag				
Use the term viscosity and relate to changes in temperature				
Use Stokes's Law				
Upthrust calculations, floating , Archimedes' principle				
Free body diagrams for falling objects in fluids,				
Hooke's Law graphs, definitions, LOP, Elastic Limit and Yield Point				
Calculate gradient and area of F vs x graphs to work out k and EPE				
Definitions of stress, strain, compression, tension, strength, breaking stress, stiffness and Young Modulus (+1 hours if needed)				
Elastic and Plastic behaviour; Behaviour of polymers under stress				
Define and identify on graphs ductile, malleable, brittle, hard and tough materials				
Application of knowledge to solve circuit problems (+ 2 hours if needed)				

Work Covered in Spring/Summer year 12

Topic to be revised	R	A	G	Comments
Electricity				
Current and Charge: definitions and calculations				
The drift/current equation for electron speed				
PD and Energy: definitions and calculations, the electronvolt				
Conservation of Charge and Energy: Kirchhoff's Laws				
Current voltage graphs of components; Thermistors and LDRs; Resistance graphs and explaining the shapes, effect of temp on R (+1 hour if needed)				

Resistance definitions and calculations: Ohm's Law				
Resistivity calculations				
Semiconductors, conduction band.				
Potential divider (+ 1 hour if needed)				
EMF and Internal Resistance (+1 hour if needed)				
Power calculations				
Waves				
Define and apply the key terms associated with describing waves, describing the difference between longitudinal and transverse waves; Use $v = f\lambda$				
The electromagnetic spectrum; Sound waves				
Refractive index and refraction. The critical angle and total internal reflection (+1 hour if needed)				
Lenses, understanding, focal length, lens power, magnification and drawing ray diagrams. (+1 hours if needed)				
The lens equation				
Wavefronts, coherence, superposition, phase difference and path difference				
Standing waves; speed of a wave on a string				
Constructive and destructive interference				
Diffraction, Young slits, diffraction gratings.				
Use of diffraction grating equation				
Intensity (flux) as $I = P/A$				
Transmission and absorbance of waves				
Pulse echo techniques to determine distance				
The Photoelectric effect and emission of photoelectrons;				

Planck's constant (+1 hour if needed)				
Light as photons, $E = hf$, Waves as particles and vice versa; the electronvolt;				
De Broglie waves				
Absorption and emission spectra, energy levels in atoms; historical development.				

Work Covered in Summer Yr12& Sept Oct Yr13

Topic to be revised	R	A	G	Comments
Further Mechanics:				
Momentum: calculations, conservation in two dimensions				
Force as a change in momentum, impulse.				
Conservation of energy, elastic and inelastic collisions, $E_k = p^2/2m$				
Circular motion, angular velocity and radians				
Circular motion, centripetal force and acceleration				
Circular motion, applying the equations				
Circular motion: orbits				
Circular motion in a vertical circle				
Circular motion, banking.				
Fields:				
Describing and calculating the strength of uniform and radial electric fields;				
Drawing radial and uniform electric fields				
Calculation the force felt by charged particles in fields;				

Calculating the force between two charged particles				
Particles:				
Atomic mass, atomic number and isotopes				
Rutherford alpha particle scattering and the structure of the nucleus				
Particle accelerators: the LINAC				
The effect of magnetic fields				
Particle accelerators: the Cyclotron;				
$r = p/BQ$ for charged particles in a magnetic field				
Use $E = mc^2$, discuss annihilation and the nature of antimatter				
Recall and use the standard model (quark-lepton) to describe the nature of matter.				
Conservation laws in particle Physics.				

