	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
Theme/Big Idea	**Topic 1 and 2** Context Working as a Physicist and Mechanics	**Topic 3** Context- Electrical Circuits	**Topic 4** Context- Materials (Fluids and Solids)	**Topic 5** Context- Waves and the Particle Nature of Light	**Topic 6** Context- Further Mechanics	**Topic 7** Context- Electric and Magnetic Fields
Content What are they learning? (including keywords)	**What are they learning** **Topic 1, Working as a physicist- taught throughout** Kinematics: Motion described using displacement, velocity, and acceleration; use SUVAT equations for constant acceleration. Graphs of Motion: Gradient of displacement–time = velocity Gradient of velocity–time = acceleration Area under velocity–time = displacement Forces & Newton's Laws: 1st: objects remain constant unless acted on	**What are they learning** Current & Charge: Current is the rate of flow of charge (I = Q/t); measured in amperes. Potential Difference & Resistance: V = IR (Ohm's Law for ohmic conductors) Resistance depends on material, length, and temperature. Power & Energy: Power = IV Energy transferred = VIt Circuits: Series: current same, voltage shared	**What are they learning** Density: Density = mass ÷ volume; important for identifying materials and comparing properties. Deformation: Materials stretch under force → elastic (returns to shape) vs plastic (permanent deformation). Stress & Strain: Stress =force ÷area Strain =extension ÷ original length Hooke's Law: Force ∝ extension (F = kx) up to the	**What are they learning** Wave Properties: Waves transfer energy without transferring matter; key terms include wavelength, frequency, amplitude, and wave speed (v = fλ).Types of Waves: Transverse: oscillations perpendicular (e.g. light) Longitudinal: oscillations parallel (e.g. sound) Wave Behaviour: Waves can reflect, refract, diffract, and interfere	**What are they learning** Circular Motion: Objects moving in circles require a centripetal force directed towards the centre (F = mv²/r). Angular Motion: Described using angle (radians), angular velocity, and centripetal acceleration.	**What are they learning** Fields: electric and magnetic forces act at a distance and are the region in which charged particles experience a force. Represent electric fields using field lines. Define and calculate electric field strength: *E=F/Q* E=V/d for uniform fields. Coulomb's Law to calculate forces between point charges. Calculate electric field strength around point charges: $E = \frac{Q}{4\pi\varepsilon_0 r^2}$ Understand electric potential and potential difference. Sketch and interpret: Radial fields around point charges. Uniform fields between parallel plates. Understand the motion of charged particles in uniform electric fields.

	2nd: F = ma 3rd: action–reaction pairs Free Body Diagrams: Used to show forces acting on an object (e.g. weight, normal contact force, drag). Momentum: p = mv; conserved in collisions and interactions (important for explosions and impacts).	Parallel: voltage same, current splits I–V Characteristics: Different components (resistors, diodes, lamps) show different current–voltage relationships.	limit of proportionality. Stress–Strain Graphs: Show elastic region, yield point, plastic deformation, and breaking point; gradient = Young's modulus (stiffness).	depending on conditions. Superposition & Interference: When waves overlap, they combine; can produce constructive (increase) or destructive (cancel) interference. Refraction & Optics: Change in speed when entering different media causes bending; described by refractive index.		Describe the structure and function of a capacitor. Understand capacitance: $C=Q/V$ Investigate charging and discharging processes. Analyse exponential charge and discharge graphs. Use equations involving: Charge stored Potential difference Time constant ($\tau=RC$) Calculate energy stored in a capacitor: $E=0.5QV$ $E=0.5CV^2$ Understand practical applications such as camera flashes and smoothing circuits. Magnetic Fields: Understand magnetic fields around: Permanent magnets Straight conductors Solenoids Use the motor effect and Fleming's Left-Hand Rule. Calculate force on a current-carrying conductor: $F=BIL\sin\theta$ Define magnetic flux density (B). Calculate force on moving charged particles: $F=BQv\sin\theta$ Explain circular motion of charged particles in magnetic fields. Understand applications such as particle accelerators, motors, and mass spectrometers.

KEYWORDS	Displacement Velocity Acceleration SUVAT Force Newton's laws Free body diagram Momentum Mass Resultant force	Current Charge Potential difference Resistance Ohm's Law Power Energy Series circuit Parallel circuit I–V characteristic	Density Stress Strain Extension Hooke's Law Elastic Plastic Young's modulus Limit of proportionality Tensile strength	Wave Wavelength Frequency Amplitude Wave speed Transverse Longitudinal Interference Refraction Diffraction	Conservation of momentum Impulse Elastic collision Inelastic collision Newton's Third Law Circular motion Angular displacement (θ) Radian Angular velocity (ω) Angular speed Tangential velocity Period (T) Frequency (f) Centripetal acceleration Centripetal force Radius of curvature Tangent	Electric field Electric field strength (E) Electric force Point charge Coulomb's law Permittivity of free space (ε_0) Uniform electric field Radial electric field Field lines Electric potential Electric potential difference (voltage) Equipotential surface Capacitor Capacitance (C) Farad (F) Dielectric Time constant (RC) Exponential Leakage current Magnetic flux density (B) Lorentz force Particle accelerator Mass spectrometer
Skills How are they learning it?	CORE PRACTICAL 1: Determine the acceleration of a freely-falling object.	CORE PRACTICAL 2: Determine the electrical resistivity of a material. CORE PRACTICAL 3: Determine the e.m.f. and internal resistance of an electrical cell.	CORE PRACTICAL 4: Use a falling-ball method to determine the viscosity of a liquid. CORE PRACTICAL 5: Determine the Young modulus of a material	CORE PRACTICAL 6: Determine the speed of sound in air using a 2-beam oscilloscope, signal generator, speaker and microphone. CORE PRACTICAL 7: Investigate the effects of length, tension and mass per unit length on the frequency of a vibrating string or wire.	CORE PRACTICAL 9: Investigate the relationship between the force exerted on an object and its change of momentum. CORE PRACTICAL 10: Use ICT to analyse collisions between small	CORE PRACTICAL 11: Use an oscilloscope or data logger to display and analyse the potential difference (p.d.) across a capacitor as it charges and discharges through a resistor.

				CORE PRACTICAL 8: Determine the wavelength of light from a laser or other light source using a diffraction grating	spheres, e.g. ball bearings on a table top.	
Key Questions	How do you apply SUVAT equations to motion problems? What does the area under a velocity–time graph represent? How does Newton's 2nd law explain motion? How do you draw and use a free body diagram? When is momentum conserved?	What is the relationship between current, charge, and time? How do you apply Ohm's Law (V = IR)? What happens to current and voltage in series vs parallel circuits? How do you calculate electrical power and energy? Why do components have different I–V graphs?	How do you calculate stress and strain? What is the difference between elastic and plastic deformation? What does the gradient of a stress–strain graph represent? What is the limit of proportionality in Hooke's Law? How do different materials (e.g. ductile vs brittle) behave?	What is the relationship $v = f\lambda$ and how is it used? What is the difference between transverse and longitudinal waves? How do interference patterns form? What happens during refraction and why does light bend? What factors affect diffraction?	Why is momentum conserved in an isolated system? How can momentum and impulse be used to analyse collisions and explosions? Why can momentum be conserved while kinetic energy is not? (elastic vs inelastic collisions) Why does an object moving in a circle experience an acceleration even when its speed is constant? What force provides the centripetal force that keeps an object moving in a circular path?	How do electric fields exert forces on charged particles? How are electric potential and electric potential difference related to energy transfer? How do capacitors store and release charge and energy? How do magnetic fields interact with currents and moving charged particles? How do electric and magnetic fields affect the motion of charged particles?

Assessment (specific assessed piece(s); milestone(s))	**Peer assessment** – HWK practical question **Summative 1** – Topic 1 and 2 test **CPAC assessment –** Core practical 1.	**Peer assessment** – HWK practical question **Summative 2** – AS Paper 1 **2 CPAC assessments –** Core practicals 2 and 3	**Peer assessment** – HWK practical question **Summative 3** – Topic 1 and 4 **2 CPAC assessments –** Core practicals 4 and 5	**Peer assessment** – HWK practical question **Summative 4** – Topic 1, 4 and 5 **Summative 5** – AS Paper 2 **2 CPAC assessments –** Core practicals 6 and 7	**Peer assessment** – HWK practical question **Summative 6** – Topic 1, 2 and 6 **Summative 7 –** Adapted Paper 3 (in mock window) **2 CPAC assessments –** Core practicals 9 and 10	**Peer assessment** – HWK practical question **Summative 8** – Topic 3, 5 and 7 **CPAC assessment –** Core practical 11