

Subject	Year	Term
Physics	12	1
Topic		
Topic 2 Mechanics		
Content (Intent)		
Prior Learning (Topic) 11P1 Forces		
<p>Draw and interpret graphs of motion Derive equations of motion: suvat Practise problems in one dimension. Measurement of the acceleration of free fall.</p>		
<p>Projectiles. Independence of vertical and horizontal motion 'Monkey and hunter' demonstration. Introduce vectors and vector addition Practise calculations scale drawing Parallelogram law equivalence to 'nose to tail' – shown using drawings. Bodies in equilibrium: vector forces on body sum to zero, triangle of forces Resolution of vectors into two components at right angles to each other by calculation and scale drawing. Free-body force diagrams Newton's second law of motion $\sum F = ma$ Mass and weight. $W = mg$ Newton's third law and Newton's first law of motion. Linear momentum, $p = mv$. Discuss and calculate values for, e.g. car and truck with different speeds. Principle of conservation of linear momentum as a consequence of Newton's laws of motion. Collision problems in one dimension. Work done and energy transfer K.E. & G.P.E. Derivation of $E_k = \frac{1}{2}mv^2$ and $\Delta E_{grav} = mg\Delta h$ $\Delta W = F\Delta s$ and $\Delta W = F\Delta s \cdot \cos\theta$ Principle of conservation of energy. Application to mechanical situations, e.g. 'frictionless' rollercoaster: $E_p + E_k = \text{constant}$. $P = \frac{W}{t}$ Derive $P = Fv$ using $\frac{\Delta W}{\Delta t} = \frac{F\Delta s}{\Delta t}$ $P = \frac{W}{t}$ and $P = \frac{E}{t}$ Discuss useful work done → efficiency. Efficiency = [useful power output]/[total power) input. Centre of gravity Moment of a force; the principle of moments.</p> <ul style="list-style-type: none"> <i>CORE PRACTICAL 1:</i> Determine the acceleration of a freely falling object. 		
How will knowledge and skills be taught? (Implementation)	How will your understanding be assessed & recorded (Impact)	
<p>Motion on a linear air track to demonstrate N1. Examples of free-body diagrams Investigate the transfer of GPE to KE for a trolley rolling down a ramp.</p>	<p>Homework Booklet 2 marked and written feedback given Test 2 marked, graded and feedback given</p>	

Include examples where the forces are not all parallel to each other.	
How can parents help at home?	
Check that the homework booklet 2 is completed	
Helpful further reading/discussion	
Reading Advanced Physics for you chapter 2,3,4,5	Vocabulary Lists <i>See front of homework booklet</i>
Careers Links	