

# Year 12 Further Maths – Further Mechanics 1 Teacher

Topic		Ref	Ex
<b>Momentum and impulse</b>	<b>Momentum and impulse</b> <ul style="list-style-type: none"> <li>• understand the definitions, derivation, and units of momentum and impulse;</li> <li>• understand what happens to the momentum of a sphere as a result of a collision;</li> <li>• be able to use the principle of conservation of momentum applied to direct collisions in 1-dimension</li> </ul>		
	<b>Momentum and Impulse Assessment</b>		
<b>Work, Energy and Power</b>	<b>Work and kinetic energy</b> <ul style="list-style-type: none"> <li>• understand the derivation, units and definitions of work and energy;</li> <li>• be able to define kinetic energy (KE);</li> <li>• understand that work done on a body moving in a horizontal plane is the change in kinetic energy.</li> </ul>		
	<b>Potential energy, work-energy principle, conservation of mechanical energy, problem solving</b> <ul style="list-style-type: none"> <li>• understand the concept of gravitational potential energy (GPE);</li> <li>• be able to include GPE when applying the work-energy principle;</li> <li>• know the conditions for conservation of mechanical energy;</li> <li>• be able to solve problems involving work and energy.</li> </ul>		
	<b>Power</b> <ul style="list-style-type: none"> <li>• understand that power in watts is the rate of doing work;</li> <li>• be able to calculate the power (<math>P</math>) of a vehicle with a tractive (driving) force <math>F</math>, moving with velocity <math>v</math>;</li> <li>• be able to use the formula <math>P = Fv</math> in problem solving.</li> </ul>		
<b>Work, Energy and Power Assessment</b>			

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<b>Elastic Collisions in One Dimension</b>	<b>Direct impact of elastic spheres, Newton's law of restitution and loss of kinetic energy due to impact</b> <ul style="list-style-type: none"><li>• be able to express the 'compressibility', 'bounciness' or 'elasticity' of an object by a value called the coefficient of restitution (<math>e</math>);</li><li>• know that <math>0 \leq e \leq 1</math> [and that <math>e = 0</math> means inelastic and <math>e = 1</math> means perfectly elastic];</li><li>• know and be able to use Newton's (experimental) law of restitution for direct impacts of elastic spheres;</li><li>• be able to calculate the change in kinetic energy due to an impact.</li></ul>		
<b>Elastic Collisions in One Dimension Assessment</b>			