

Subject Focus:	Motion, Forces and Energy
Learning Outcome 2:	At the end of the programme, I can relate forces and energy to motion.
(Controlled and Coursework)	<i>Motion related to different parts of a journey.</i> <i>Relate forces in a system to different physical concepts and laws, including Hooke's law, Moments and Pressure.</i> <i>Newton's laws and momentum to typical applications.</i> <i>Quantify different forms of energy in a system in relation to Power and Efficiency.</i>

Assessment Criteria (MQF 1)	Assessment Criteria (MQF 2)	Assessment Criteria (MQF 3)
2.1a Distinguish between distance and displacement.	2.2a Distinguish between speed and velocity.	2.3a Distinguish between vectors and scalars.
	2.2b Use (total distance travelled)/(total time taken) to calculate the average speed.	2.3b Apply the equation in MQF Level 2 to solve problems including use of subject of the formula.
	2.2c Use (total displacement)/(total time) to calculate the average velocity.	2.3c Apply the equation in MQF Level 2 to solve problems including use of subject of the formula.
2.1d Explain the meaning of acceleration as (change in velocity)/(time taken).	2.2d Use the equation of acceleration to solve simple problems.	2.3d Apply the equation of acceleration to solve problems including use of subject of the formula.
2.1e Recognise the symbols s, u, v, a and t as referring to the displacement, initial velocity, final velocity, acceleration and time respectively.	2.2e Distinguish between the SI unit for velocity, m/s and the SI unit for acceleration m/s ² .	
2.1f Identify which section(s) in a distance-time graph indicate(s): i. a state of rest; ii. constant speed.		2.3f Sketch a distance-time graph to represent different sections of a journey: at rest and constant speed.

Assessment Criteria (MQF 1)	Assessment Criteria (MQF 2)	Assessment Criteria (MQF 3)
	2.2g Determine the speed from a distance-time graph.	2.3g Determine the average speed from a distance-time graph.
2.1h Identify which section(s) in a velocity-time graph indicate(s) an object: - at rest; - moving with constant velocity; - moving with a constant acceleration.		2.3h Sketch a velocity-time graph to represent different sections of a journey: constant velocity and constant acceleration/ deceleration.
2.1i Identify acceleration and deceleration from a velocity-time graph.		2.3i Relate a negative gradient from a velocity-time graphs to deceleration.
	2.2j Calculate acceleration from a velocity-time graph. <i>No calculation of deceleration is required.</i>	2.3j Determine the displacement and the acceleration/deceleration from a velocity-time graph using a graphical method.
	2.2k Use the equations of rectilinear motion $v=u+at$, $s=ut+\frac{1}{2}at^2$, $v^2=u^2+2as$, $s=(u+v)t/2$ to solve simple problems.	2.3k Apply the equations of rectilinear motion $v=u+at$, $s=ut+\frac{1}{2}at^2$, $v^2=u^2+2as$, $s=(u+v)t/2$ to solve problems including use of subject of the formula.
2.1l Describe the thinking distance as the distance travelled by an object moving at constant speed during the driver's reaction time.		
2.1m Identify the factors that affect the thinking distance.		2.3m Describe the factors that affect the thinking distance.
2.1n Describe the braking distance as the distance travelled by an object during deceleration.		

Assessment Criteria (MQF 1)	Assessment Criteria (MQF 2)	Assessment Criteria (MQF 3)
2.1o Identify the factors that affect the braking distance.		2.3o Describe the factors that affect the braking distance.
2.1p Identify between the thinking, braking and stopping distances represented in real-life situations.	2.2p Calculate total stopping distance as the addition of the thinking and braking distance.	2.3p Calculate the thinking, the braking and the stopping distances represented in real-life situations.
2.1q Compare human reaction time using a simple experiment in terms of distance fallen by a meter ruler.		
2.1r Describe the motion of a falling object on Earth.	2.2r Compare the motion of a falling object on Earth and on the Moon.	2.3r Describe in detail an experiment to measure the acceleration of free fall. <i>This includes providing a diagram, the procedure, adequate precautions, measurements made and how to determine the acceleration of free fall.</i>