

AQA Trilogy Physics Paper 2		Covered in Lesson	Diagnosis			Revised		
P4.5. Forces			R	A	G	1	2	3
4.5.1 Forces and their interactions	Identify and describe scalar quantities and vector quantities							
	Identify and give examples of forces as contact or non-contact forces							
	Describe the interaction between two objects and the force produced on each as a vector							
	Describe weight and explain that its magnitude at a point depends on the gravitational field strength							
	Calculate weight by recalling and using the equation: [$W = mg$]							
	Represent the weight of an object as acting at a single point which is referred to as the object's 'centre of mass'							
	Calculate the resultant of two forces that act in a straight line							
	HT ONLY: describe examples of the forces acting on an isolated object or system							
	HT ONLY: Use free body diagrams to qualitatively describe examples where several forces act on an object and explain how that leads to a single resultant force or no force							
	HT ONLY: Use free body diagrams and accurate vector diagrams to scale, to resolve multiple forces and show magnitude and direction of the resultant							
HT ONLY: Use vector diagrams to illustrate resolution of forces, equilibrium situations and determine the resultant of two forces, to include both magnitude and direction								
4.5.2 Work done and energy transfer	Describe energy transfers involved when work is done and calculate the work done by recalling and using the equation: [$W = Fs$]							
	Describe what a joule is and state what the joule is derived from							
	Convert between newton-metres and joules.							
	Explain why work done against the frictional forces acting on an object causes a rise in the temperature of the object							
4.5.3 Forces and elasticity	Describe examples of the forces involved in stretching, bending or compressing an object							
	Explain why, to change the shape of an object (by stretching, bending or compressing), more than one force has to be applied – this is limited to stationary objects only							
	Describe the difference between elastic deformation and inelastic deformation caused by stretching forces							
	Describe the extension of an elastic object below the limit of proportionality and calculate it by recalling and applying the equation: [$F = ke$]							
	Explain why a change in the shape of an object only happens when more than one force is applied							
	Describe and interpret data from an investigation to explain possible causes of a linear and non-linear relationship between force and extension							
	Calculate work done in stretching (or compressing) a spring (up to the limit of proportionality) by applying, but not recalling, the equation: [$E_e = \frac{1}{2}ke^2$]							
	Required practical 6: investigate the relationship between force and extension for a spring.							

4.5.6 Forces and motion	Define distance and displacement and explain why they are scalar or vector quantities									
	Express a displacement in terms of both the magnitude and direction									
	Explain that the speed at which a person can walk, run or cycle depends on a number of factors and recall some typical speeds for walking, running, cycling									
	Make measurements of distance and time and then calculate speeds of objects in calculating average speed for non-uniform motion									
	Explain why the speed of wind and of sound through air varies and calculate speed by recalling and applying the equation: [$s = v t$]									
	Explain the vector–scalar distinction as it applies to displacement, distance, velocity and speed									
	HT ONLY: Explain qualitatively, with examples, that motion in a circle involves constant speed but changing velocity									
	Represent an object moving along a straight line using a distance-time graph, describing its motion and calculating its speed from the graph's gradient									
	Draw distance–time graphs from measurements and extract and interpret lines and slopes of distance–time graphs									
	Describe an object which is slowing down as having a negative acceleration and estimate the magnitude of everyday accelerations									
	Calculate the average acceleration of an object by recalling and applying the equation: [$a = \Delta v/t$]									
	Represent motion using velocity–time graphs, finding the acceleration from its gradient and distance travelled from the area underneath									
	HT ONLY: Interpret enclosed areas in velocity–time graphs to determine distance travelled (or displacement)									
	HT ONLY: Measure, when appropriate, the area under a velocity– time graph by counting square									
	Apply, but not recall, the equation: [$v^2 - u^2 = 2as$]									
	Explain the motion of an object moving with a uniform velocity and identify that forces must be in effect if its velocity is changing, by stating and applying Newton’s First Law									
	Define and apply Newton's second law relating to the acceleration of an object									
	Recall and apply the equation: [$F = ma$]									
	HT ONLY: Describe what inertia is and give a definition									
	Estimate the speed, accelerations and forces of large vehicles involved in everyday road transport									
Required practical 7: investigate the effect of varying the force on the acceleration of an object of constant mass, and the effect of varying the mass of an object on the acceleration										

4.5.6 Forces and motion	Apply Newton's Third Law to examples of equilibrium situations								
	Describe factors that can affect a driver's reaction time								
	Explain methods used to measure human reaction times and recall typical results								
	Interpret and evaluate measurements from simple methods to measure the different reaction times of students								
	Evaluate the effect of various factors on thinking distance based on given data								
	State typical reaction times and describe how reaction time (and therefore stopping distance) can be affected by different factors								
	Explain methods used to measure human reaction times and take, interpret and evaluate measurements of the reaction times of students								
	Explain how the braking distance of a vehicle can be affected by different factors, including implications for road safety								
	Explain how a braking force applied to the wheel does work to reduce the vehicle's kinetic energy and increases the temperature of the brakes								
	Explain and apply the idea that a greater braking force causes a larger deceleration and explain how this might be dangerous for drivers								
	HT ONLY: Estimate the forces involved in the deceleration of road vehicles								
4.5.7 Momentum	HT ONLY: Calculate momentum by recalling and applying the equation: [$p = mv$]								
	HT ONLY: Explain and apply the idea that, in a closed system, the total momentum before an event is equal to the total momentum after the event								
	HT ONLY: Describe examples of momentum in a collision								