Physics 2	Higher		
Red	Amber	Green	
8. Forces in Balance	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		
	Calculate the resultant of two forces that act in a straight line		
	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		
	Represent the weight of an object as acting at a single point which is referred to as the object's 'centre of mass'		
	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		

Physics 2	Higher		
Red	Amber	Green	
9. Motion	Make measurements of distance and time and then calculate speeds of objects in calculating average speed for non-uniform motion		
	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: ***[$a = \Delta v/t$]***		
	HT ONLY: Explain qualitatively, with examples, that motion in a circle involves constant speed but changing velocity		
	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: ***[$v^2 - u^2 = 2as$]***		

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Red	Amber	Green

10. Force & Motion		
	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	
	Required practical: *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*	
	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]***	
	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 (and therefore stopping distance) based on given data	
	Explain how the braking distance of a vehicle can be affected by different factors, including implications for road safety	
	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	
	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	
	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: ***[$E_e = ½ke^2$]***	
	Required practical: *investigate the relationship between force and extension for a spring.*	

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12. Wave Properties	Describe waves as either transverse or longitudinal, defining these waves in terms of the direction of their oscillation and energy transfer and giving examples of each		
	Define waves as transfers of energy from one place to another, carrying information		
	Define amplitude, wavelength, frequency, period and wave speed and Identify them where appropriate on diagrams		
	State examples of methods of measuring wave speeds in different media and Identify the suitability of apparatus of measuring frequency and wavelength		
	Calculate wave speed, frequency or wavelength by applying, but not recalling, the equation: ***[v = f λ] and*** calculate wave period by recalling and applying the equation: ***[T = 1/f]***		
	Describe a method to measure the speed of ripples on a water surface		
	HT ONLY: Describe what refraction is due to and illustrate this using wave front diagrams		
	HT ONLY: Illustrate the refraction of a wave at the boundary between two different media by constructing ray diagrams		
	Required practical: *make observations to identify the suitability of apparatus to measure the frequency, wavelength and speed of waves in a ripple tank and waves in a solid*		
13. Electromagnetic Waves	Describe what electromagnetic waves are and explain how they are grouped		
	List the groups of electromagnetic waves in order of wavelength		
	Explain that because our eyes only detect a limited range of electromagnetic waves, they can only detect visible light		
	Required practical activity: *investigate how the amount of infrared radiation absorbed or radiated by a surface depends on the nature of that surface.*		
	HT ONLY: Explain how radio waves can be produced by oscillations in electrical circuits, or absorbed by electrical circuits		
	Explain that changes in atoms and the nuclei of atoms can result in electromagnetic waves being generated or absorbed over a wide frequency range		
	State examples of the dangers of each group of electromagnetic radiation and discuss the effects of radiation as depending on the type of radiation and the size of the dose		
	State examples of the uses of each group of electromagnetic radiation, explaining why each type of electromagnetic wave is suitable for its applications		

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15. Electromagnetism	Describe the attraction and repulsion between unlike and like poles of permanent magnets and explain the difference between permanent and induced magnets		
	Draw the magnetic field pattern of a bar magnet, showing how field strength and direction are indicated and change from one point to another		
	Explain how the behaviour of a magnetic compass is related to evidence that the core of the Earth must be magnetic		
	Describe how to plot the magnetic field pattern of a magnet using a compass		
	State examples of how the magnetic effect of a current can be demonstrated and explain how a solenoid arrangement can increase the magnetic effect of the current		
	Draw the magnetic field pattern for a straight wire carrying a current and for a solenoid (showing the direction of the field)		
	HT ONLY: State and use Fleming's left-hand rule and explain what the size of the induced force depends on		
	HT ONLY: Calculate the force on a conductor carrying a current at right angles to a magnetic field by applying, but not recalling, the equation: *[F = BIL]*		
	HT ONLY: Explain how rotation is caused in an electric motor		