FORCES (triple) **Content**	RAG
Name contact and non-contact forces and describe their interaction	
Define scalar and vector quantities and give examples of each	
Calculate resultant forces	
Define weight and use w=m x g to calculate any one of those values	
Define 'centre of mass'	
Draw free body diagrams to scale including **resolving forces at different angles**	
Know the equation to calculate work done and apply this to find work done, force or distance	
Describe the relationship between joules and newton-metres and convert between them	
Give examples of forces involved in stretching or compression and explain the difference between elastic deformation and inelastic deformation	
Describe the features of a graph of force applied versus the extension of a spring	
Know Hooke's Law (f = ke) and apply it in stretching or compression scenarios	
Calculate work done during stretching or compressing using $e= ½ k x e^2$	
Calculate Moments	
Understand levers and gears	
Calculate pressure in fluids **and pressure in a column of water**	
Explain upthrust	
Describe a simple model of the earth's atmosphere	
Explain why atmospheric pressure varies with height above a surface	
Interpret distance-time graphs to calculate velocity and total distance moved	
Explain the difference between distance and displacement	
Know typical values for speed for walking, running, cycling and sensible values for car, train and airplane speeds	
Describe the difference between velocity and speed and calculate them using s=d/t	
Describe circular motion in terms of speed and direction	
Interpret distance time graphs to find speed, **including drawing a tangent if the object is accelerating**	

Describe what is meant by acceleration	
Calculate the acceleration or deceleration of an object using a=v-u/t, using negative values to represent deceleration	
Use uniform acceleration equation to calculate acceleration, velocity or distance	
Know that acceleration under gravity is 9.8 m/s^2	
Interpret velocity-time graphs to calculate acceleration, velocity **and total distance/displacement**	
Draw and interpret velocity-time graphs for objects that reach terminal velocity and interpret the changing motion in terms of the forces acting on the object.	
Explain terminal velocity. Describe the change in forces during free fall of an object through a fluid.	
Apply Newton's first law to predict the effect of balanced and unbalanced forces on stationary and moving objects	
Explain what is meant by 'inertia'	
Use Newton's second law (f=ma) to calculate force, mass or acceleration	
Define inertial mass and calculate it using force/acceleration	
Apply Newton's third law to equilibrium situations – ie describe how forces exerted by two objects interacting are equal and opposite	
Define the terms stopping distance, thinking distance and braking distance and know how speed affects overall stopping distance	
Explain how reaction time can affect thinking distance and how this can be measured	
Describe physical factors that can affect braking distance – condition of tyres, road etc	
Explain why large decelerations are dangerous **and estimate values forces involved in deceleration of road vehicles**	
Describe what is meant by momentum and calculate values from an equation	
Explain what is meant by 'conservation of momentum' and apply this in calculations	
Calculate force when there is a change in momentum over time	
Explain safety features that reduce the effects of impacts	