The Sutton Academy

Knowledge Rich Curriculum Plan

Course/Unit

Lesson/Learning Sequence	Intended Knowledge: *Students will know that…*	Tiered Vocabulary	Prior Knowledge: *In order to know this students, need to already know that…*	Assessment
LO: To learn how to draw and use displacement-time graphs and velocity-time graphs.	• *Students will know how to draw displacement time graphs* • *Students will know that velocity is the rate of change of displacement.* • *Students will know that the gradient on a displacement-time graph the gradient represents the velocity.* • *Students will know that if the displacement-time graph is a straight line, then the velocity is constant.* • *Students will know that the average velocity = displacement from starting point/ time taken.* • *Students will know that acceleration is the rate of change of velocity.* • *Students will know that in a velocity-time graph the gradient represent the acceleration.* • *Students will know that if the velocity-time graph is a straight line, then the acceleration is constant.* • *Students will know that the area between a velocity-time graph and the horizontal axis represents the distance travelled.* • *Students will know that for a motion in a straight line with positive velocity, the area under the velocity-time graph up to a point t represents the displacement at time t.*		Students will need to know how to draw graphs Students will need to know how to find a gradient. Students wlll need to know how to find the area under a graph.	
LO: To learn how to learn how to use constant acceleration formulae.	• *Students will know that that u = initial velocity. V = final velocity* • *S = displacement, a = acceleration. T = time.* • *Students will know how to use the v=u +at formula.* • *Students will know to use the formula s =* $\left(\frac{u+v}{2}\right)t$ • *Students will know how to derive the formula from a velocity graph.* • *Students will know how to draw models and use the formula.*	g	Students will need to know how to rearrange formula.	
LO: To learn how to learn how to use constant acceleration formulae.	• *Students will know how to use the formula* $v^2 = u^2 + 2as$ • *Students will know how to use the formula* $s = ut + \frac{1}{2}at^2$ • *Students will know how to use the formula* $s = vt - \frac{1}{2}at^2$ • *Students will know how to draw models and use the formula.*		Students will need to know how to rearrange formula.	
To learn how to solve problems involving vertical motion under gravity.	• *Students will know that the downward acceleration of an object can be modelled as* $g = 9.8$ • *Students will know that the upward acceleration of an object can be modelled as* $g = -9.8$ • *Students will be able to apply the above to the equations of motion.* • *Students will be able to draw models based on gravity.* • *Students will be able to solve problems involving upwards and downwards motion.*		Students will need to know the equations of motion.	

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Students will know how to use the trapezium rule to approximate integration.	• Students will know that if you cannot integrate a function algebraically, you can use a numerical method to approximate the area beneath a curve. • Students will know that to approximate the area given by $\int_a^b ydx$ you can divide the area into n equal strips. Each strip will be of width h where $h = \frac{b-a}{n}$ • Students will know that $\int_a^b ydx \approx \frac{1}{2}h(y_0 + 2(y_1 + y_2 \dots + y_{n-1}) + y_n)$ where $h = \frac{b-a}{n}$ and $y_i = f(a + ih)$ • Students will know if there answer is an overestimate (convex) or underestimate.		Students will need to know the area of a trapezium. Students will need to know how to substitute into a formula Students will need to know how to use radians.	