



The Sutton Academy

Knowledge Rich Curriculum Plan

Course/Unit



Lesson/Learning Sequence	Intended Knowledge: <i>Students will know that...</i>	Tiered Vocabulary	Prior Knowledge: <i>In order to know this students, need to already know that...</i>	Assessment
<p>To learn how to use the vector equations of motion.</p>	<ul style="list-style-type: none"> Students will know that if a particle starts from the point with position vector \mathbf{r}_0 and moves with constant velocity \mathbf{v}, then its displacement from its initial position at time t is \mathbf{vt} and its position vector \mathbf{r} is given by $\mathbf{r} = \mathbf{r}_0 + \mathbf{vt}$ Students will know that otherwise informed \mathbf{i} and \mathbf{j} are unit vectors due east and north. Students will know how to find a position vector given a time Students will know how to solve questions involving constant acceleration in two dimensions using the vector equations of motions. 		<p>Students will need to know how to calculate with vectors. Students will need to know how to find the magnitude of vectors. Students will need to know how to find angles between vectors.</p>	
<p>To learn how to use the vectors equations of motion with projectiles.</p>	<ul style="list-style-type: none"> Students will know that when using vectors with projectiles, you should consider \mathbf{i} and \mathbf{j} to be the unit vectors horizontally and vertically, unless told otherwise. Students will know how to model projectiles using vectors. Students will know how to solve problems modelling projectiles as vectors. 		<p>Students will need to know how to model projectiles. Students will need to know how to apply the suvat equations to projectiles.</p>	
<p>to learn how to solve problems using variable acceleration in one dimension.</p>	<ul style="list-style-type: none"> Students will know that the equations of motions for constant acceleration allow you to write velocity and displacement as functions of time. Students will know that when a body experiences variable acceleration you can model the acceleration as a function of time. Students will know that you can use calculus to describe the relationship between displacement, velocity and acceleration. Students will know how to use calculus to solve problems. 		<p>Students will need to know how to use differentiate and intergrate. Students will need to know how $v = \frac{ds}{dt}$ and $s = \int v dt$ Students will need to know how $a = \frac{dv}{dt}$ and $v = \int a dt$</p>	
<p>To learn how to use calculus with vectors to solve problems involving motion in two dimensions with variable acceleration.</p>	<ul style="list-style-type: none"> Students will know that to differentiate a vector quantity in the form $f(t)\mathbf{i} + g(t)\mathbf{j}$, you differentiate each function of time separately. Students will know how to differentiate vectors to find velocity and acceleration. Students will know how to solve problems involving differentiating vectors 		<p>Students will need to know how to use differentiate. Students need to know how to find the minimum and maximum points.. Students need to know the suvat equations.</p>	
<p>To learn how to integrate vectors to solve problems.</p>	<ul style="list-style-type: none"> Students will know that to integrate a vector quantity in the form $f(t)\mathbf{i} + g(t)\mathbf{j}$, integrate each function separately. Students will know how to integrate vectors to find velocity and displacement. Students will know how to solve problems involving integrating vectors 		<p>Students will need to know how to use integrate. Students need to know the suvat equations.</p>	