



**Science
Advanced Placement
Physics**

Unit Name: Newtonian Mechanics		First 9 Weeks, Days to Teach: 26-27	
Date Taught	TEKS and AP Required Elements	Content/Vocabulary	Guiding Questions
	<p>AP Physics Connections:</p> <p>Generate and interpret graphs describing motion including the use of real-time technology.</p>	<p>Generate and interpret graphs, understand and derive information from graphs with and without technology.</p> <p>Dependant, independent variable, slope, area under curve, best fit line</p>	<p>How can you graph position vs. time?</p> <p>How can you calculate slope and interpret the meaning of the number and units?</p> <p>How can you find the area under the curve and its significance?</p> <p>How can you make a prediction based on the graph?</p>
	<p>AP Physics Connections:</p> <p>I. Newtonian Mechanics</p> <p>A. Kinematics</p> <ol style="list-style-type: none"> 1. Motion in one dimension 2. Motion in two dimensions 	<p>Calculate and graph motion in one dimension including accelerated motion.</p> <p>Understand the significance of the direction.</p> <p>Calculate, graph, and predict range of projectiles.</p> <p>Displacement, distance, velocity, acceleration, translation.</p>	<p>How can you calculate and graph position vs. time, derive acceleration from the graph?</p> <p>How can you use kinematic equations to describe motion?</p>



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	<p>AP Physics Connections:</p> <p>I. Newtonian Mechanics B. Newton's Laws of Motion</p>	<p>Understand the relationship between force and acceleration including directions. Find net force and be able to construct force diagrams. Vector, force, magnitude, impulse, momentum, trig identities</p>	<p>How can you determine the tension in a string?</p> <p>How can you calculate the time needed to move down an incline including friction?</p>
	<p>AP Physics Connections:</p> <p>I. Newtonian Mechanics D. Systems of particles, linear momentum</p>	<p>Understand and apply conservation laws to movement. Understand and make predictions of systems of particles. Trig identities, restitution, elastic, inelastic</p>	<p>How can you calculate the final velocity and direction of an object involved in an off-centered collision?</p> <p>How high will a hanging block rise when a projectile embeds in it?</p>
	<p>AP Physics Connections:</p> <p>I. Newtonian Mechanics E. Circular motion and rotation</p>	<p>Understand and calculate the direction and magnitude of centripetal force. Calculate acceleration and final velocity of an object moving in a circle.</p>	<p>What is the direction and magnitude of force as the object moves in a circle?</p>



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		Circle, radians, rotation, revolution, arc, torque	
	AP Physics Connections: I. Newtonian Mechanics F. Oscillations and Gravitation	Measure spring constants and use k to predict maximum extension and time of oscillation. Harmonic motion, amplitude, period, frequency, pendulum,	How long will it take a pendulum of length l to make one oscillation? What is the relationship between k and restoring force?