

**Science
Physics
Unit 1: Kinematics**

Essential Understandings	<ul style="list-style-type: none"> ▪ Causation: Nothing “just happens.” Everything is caused. ▪ Interrelatedness: Everything in the universe is connected to everything else in the universe. ▪ Dynamism: Everything is changing in some way all the time. ▪ Entropy: Change has direction. Generally, simple precedes complex. Generally, order changes toward disorder. ▪ Uniformitarianism: The way the universe works today is the way it worked yesterday and the way it will work tomorrow.
Essential Questions	<ul style="list-style-type: none"> ▪ What are the similarities and differences among speed, velocity and acceleration? ▪ How does the slope of a position/time graph represent the motion of an object? ▪ How does the slope of a position/time graph predict the motion of an object? ▪ What does the slope of a velocity/time curve represent? ▪ What are the ideas of relative motion and frames of reference? ▪ How does inertia relate to the change in motion of an object?
Essential Knowledge	<ul style="list-style-type: none"> ▪ Motion is the change of position. ▪ Average speed is the ratio of distance traveled to the time elapsed. ▪ Acceleration is the rate at which velocity changes. ▪ Inertia is the amount an object resists change to its current motion. ▪ Mass is the measure of the object’s inertia.
Vocabulary	<ul style="list-style-type: none"> ▪ <u>Terms:</u> <ul style="list-style-type: none"> ○ acceleration, average speed, component, free fall, instantaneous speed, relative motion , resolution, resultant, scalar, speed, vector, velocity
Essential Skills	<ul style="list-style-type: none"> ▪ Use mathematics to calculate velocity, acceleration, time and distance. ▪ Analyze motion to realize the relationships among distance, velocity and acceleration. ▪ Interpret the slopes on motion graphs.
Related Maine Learning Results	<p><u>Science and Technology</u> D. The Physical Setting D4. Force and Motion Students understand that the laws of force and motion are the same across the universe.</p> <ol style="list-style-type: none"> a. Describe the contribution of Newton to our understanding of force and motion, and give examples of and apply Newton’s three laws of motion and his theory of gravitation. b. Explain and apply the ideas of relative motion and frame of reference.

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Sample Lessons And Activities	<ul style="list-style-type: none"> ▪ Word problem worksheets ▪ Motion Labs, i.e., constant velocity, acceleration ▪ Lectures ▪ Motion demonstrations ▪ Motion Videos
Sample Classroom Assessment Methods	<ul style="list-style-type: none"> ▪ Chapter tests ▪ Motion quizzes ▪ Laboratory reports
Sample Resources	<ul style="list-style-type: none"> ▪ <u>Publications:</u> <ul style="list-style-type: none"> ○ <u>Physical Science</u> - Glencoe ○ MARVEL Data bases ○ GALE Resource Data bases ▪ <u>Videos:</u> <ul style="list-style-type: none"> ○ <u>The Mechanical Universe</u> ○ <u>ESPN Sports Figures</u>