Locust Grove High School Unit Lesson Plan

Grade Level:	10th	Subject:	Physical Science (Motion)	Prepared By:	N. Gillies

Georgia Performance Standards Addressed

SPS8. Students will determine relationships among force, mass, and motion.

a. Calculate velocity and acceleration.

b. Apply Newton's three laws to everyday situations by explaining the following:

Inertia

Relationship between force, mass and acceleration

Equal and opposite forces

c. Relate falling objects to gravitational force

d. Explain the difference in mass and weight.

e. Calculate amounts of work and mechanical advantage using simple machines.

Teacher Guide	Student Guide
Activating Strategies: Daily warm ups on motion concepts. Students will view in class demonstrations or online simulations to relate motion concepts to real life. In class demonstrations of simple and complex physical processes will be used as discussion starters to gauge previous knowledge of the students and to encourage student participation and discussion. Is the Car Moving? The Moving Man	**Students will be able to …** • Differentiate between distance and displacement. • Describe the difference between average speed and instantaneous speed. • Analyze and interpret a position vs time graph. • Calculate an object's velocity and/or acceleration. • Compare initial and final velocities in order to describe accelerated motion. • Differentiate between constant velocities and accelerated motion. • Recognize that all objects fall at the same rate in the absence of air resistance. • State Newton's Laws of Motion in their own words. • Demonstrate an example of Newton's Laws of Motion. • Explain the conditions needed to reach terminal velocity. • Describe the difference between mass and weight • Calculate the net force acting on an object.

Acquisition Strategies: Students will acquire knowledge through a mixture of lecture, real world examples, practice problems, and investigative lab activities. Students will apply information discussed in lectures to mathematical concepts that will be used throughout the course to reinforce physics principles and concepts.	**Interdisciplinary Connections:** Algebraic equations, dimensional analysis, graphing will be used in conjunction with measurements and the application of significant figures.	
Differentiated Instructional Support Independent work time so that teacher can assess individual student progress on concepts. Small groups for practice and lab experiments, peer tutoring, self-assessing of formal assessments.	**Post Assessment of Student Outcomes** Lab reports and a unit test will be analyzed to assess students' retention and application of the concepts covered during the math and measurement unit. Students must apply the concepts to future units, so assessment will be ongoing throughout the semester.	
Activities/Resources/Technology measuring devices, LCD projector, Lab equipment for demos and experiments, PHeT simulations, CPO Lab equipment	**If learning does not occur:** · (large group) Reteaching of concepts and extra practice using situations that can be done and seen in the classroom to reinforce concepts for mastery · (individual students) Tutoring sessions before/after school · Future warm ups will cover weaker areas of the unit, in collaboration with future units.	
Formative and/or Summative Assessments: Ongoing assessment will occur as students complete various tasks during class. Short quizzes will be used to monitor individual student progress on concepts covered during math and measurement unit. Students must show step by step calculations for all conversions. Unit test upon covering the listed standards. Students will complete a lab report for the Car and Ramp Velocity & Acceleration Lab	**Key Terms and Vocabulary:** Distance, displacement, speed, velocity, instantaneous velocity, constant velocity, average velocity, acceleration, deceleration, slope, position-time graph, force, balanced forces, unbalanced forces, Newton's Laws of Motion, gravity, free-fall, terminal velocity, air resistance, friction, net force, mass, weight **SI Prefixes to know:** Mega-, kilo-, centi-, milli-, micro-	