Locust Grove High School Unit Lesson Plan

Grade Level:	11-12	Subject:	Honors Physics (one-dimensional motion)	Prepared By:	Gillies

Georgia Performance Standards Addressed

SP1 Students will analyze the relationships between force, mass, gravity, and the motion of objects.
Elements:

a. Calculate average velocity, instantaneous velocity, and acceleration in a given frame of reference.
b. Compare and contrast scalar and vector quantities.
c. Compare graphically and algebraically the relationships among position, velocity, acceleration, and time.

Teacher Guide	Student Guide
Activating Strategies: Daily warm ups on motion and demonstrations of concepts talked about. (car on ramp, projectile launcher). 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.	**Students will be able to …** ▪ Calculate an object's average velocity ▪ Express motion with graphs ▪ Differentiate between distance and displacement ▪ Explain the difference between average and instantaneous velocity ▪ Determine the average and instantaneous velocity from motion graphs ▪ Describe how acceleration affects motion ▪ Apply the three basic kinematics equations to physics problems ▪ Apply significant figure rules and dimensional analysis as learned from previous unit. ▪ Correctly distinguish between scalar and vector quantities discussed during the unit.
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 real life situations involving motion.	**Interdisciplinary Connections:** Algebraic graph relationships and solving multiple variable equations.
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** Formal lab reports and unit test will be analyzed to assess students' retention and application of the concepts covered during the one dimensional motion unit. Students must apply the concepts to future units, so assessment will be ongoing throughout the semester.
Activities/Resources/Technology CPO lab equipment, class website with notes, Physlet Physics DVD, Mythbusters DVD, Time Warp DVD	**Scoring Rubrics:** Rubric will be provided to students for the formal lab report regarding accelerated motion.

Formative and/or Summative Assessments:	**Key Terms and Vocabulary: Review previous unit's vocabulary**
Conceptual review questions on displacement and velocity. Creation of graphs that represent motion in one dimension. Formal lab report covering avg velocity, instantaneous velocity, and acceleration. Unit test upon covering the listed standards.	speed, velocity, average velocity, instantaneous velocity, initial velocity, final velocity, acceleration, distance, displacement, free fall, gravitational acceleration, terminal velocity, position-time graph, velocity-time graph, acceleration-time graph Kinematics Equations for constant acceleration: 1. $v_f = v_o + at$ 2. $\Delta x = v_o t + 1/2\ at^2$ 3. $v_f^2 = v_o^2 + 2a\Delta x$