Unit 1: One Dimensional Motion

Text:
All sections of Chapter 2.

Homework:
Questions (p. 29-30): 2, 3, 4, 5 (*see homework 1*)

Problems (p. 30-37):

#1)	Questions (p. 29) 2, 3, 4, 5 & Problem 67	*graphs*
#2)	3, 9, 14, 17, 21, 70	*velocity & acceleration*
#3)	24, 26, 29, 34, 35, 43	*constant acceleration*
#4)	44, 46, 48, 51, 52, 61, 62	*free fall*
#5)	74, 76, 89, 94, 105	*review*

Vocabulary:
position, displacement, average speed, average velocity, (instantaneous) velocity, speed, average acceleration, (instantaneous) acceleration, free fall, "acceleration due to gravity"

Math:
definitions: $\bar{v} = \frac{\Delta x}{\Delta t}$ $v = \frac{dx}{dt}$ $\bar{a} = \frac{\Delta v}{\Delta t}$ $a = \frac{dv}{dt}$

derived formulas: $x = \frac{1}{2}at^2 + v_i t + x_i$ $v_f^2 = v_i^2 + 2a\Delta x$ $\bar{v} = \frac{1}{2}\left(v_i + v_f\right)$

skills: solving simultaneous equations, finding the roots of a quadratic, calculating the slope of a line, calculating slopes of a curve, calculating and interpreting derivatives, interpreting graphs

Key Objectives:
- ☐ use appropriate units of measure.
- ☐ define and explain the following concepts: displacement, velocity, speed and acceleration.
- ☐ explain and differentiate between average speed and average velocity.
- ☐ explain and differentiate between speed and velocity.
- ☐ explain the mathematical definitions, using appropriate examples.
- ☐ derive and explain formulas used in class.
- ☐ explain the concept of free-fall, including the effects of air resistance.
- ☐ construct and interpret graphs of straight-line motion (position, velocity and acceleration.)
- ☐ correctly use and apply the sign conventions for displacement, velocity and acceleration.
- ☐ correctly apply the concepts (and mathematics) of displacement, velocity and acceleration in a variety of word problems.
- ☐ interpret and analyze lab data relating to straight-line motion.
- ☐ explain and evaluate the various procedures from labs we have done.