**Accelerated Motion Graphing**

**Objective:** To understand how position vs. time graphs for objects that are accelerating differ from objects that

move with constant velocities

You and your group will be using motion sensors in order to create a position vs. time, velocity vs. time, and acceleration vs. time graphs for objects whose velocity and acceleration are in the same direction, and then for objects whose velocity and acceleration are in opposite directions. *Remember: the sign for the direction is arbitrary, but be consistent!*

You will examine objects:

* Moving in the positive direction with positive acceleration
* Or moving in the negative direction with negative acceleration

You will examine objects:

* Moving in the positive direction with negative acceleration
* Or moving in the negative direction with positive acceleration

Again, you will be collecting data for these different types of motion and creating graphs for each of these types of motion. You should have position vs. time, velocity vs. time, and acceleration vs. time graphs for each of these movements.

Questions to guide your thoughts and discussion:

* What is the direction of motion of the object?
* How does the direction of motion relate to the direction that the cart moves relative to the sensor?
* What is happening to the speed of the object over time?
* What happens to the displacement that occurs each second as time increases (compared to previous displacements per second)?
* How does the shape of the position vs. time graph compare to a position vs. time graph for constant velocity motion? Velocity vs. time graph comparison?

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