**What affects acceleration?**

**Task:** Design an experiment that examines a factor that affects acceleration. You and your group are provided with a limit set of materials you can choose from. The teacher must approve other materials that students want to use. The experimental design is to be checked and approved by the teacher before it is carried out. Time is given in class to perform the experiment. One group submits 1 copy of the lab report. Make sure to check lab write-up requirements and the lab report rubric.

Time to be creative!

**Group**: 2-5 people per group

**Materials:**

Wooden ramp

Ticker tape

Dynamics cart

Masking tape

Meter sticks

Weights and Mass set

Measuring tape (1 set)

Plastic bags

Scissors

Protractors

Stop watch/Phone

**Schedule:**

*Monday March 23, 2014* - Teacher must approve group's purpose, materials, and rough outline of procedure. No teacher approval, experiment cannot be done next class.

*Wednesday March 25, 2014* - Time in class to conduct the experiment. Students are not allowed to perform their experiment outside of the class during this period.

*Wednesday April 8, 2014* - Lab due (day of Unit Test).

**Lab design requirements**

1. Make sure your experiment has a clear purpose that clearly identifies the independent and the dependent variable.
2. Your independent and dependent variables must be **measureable**.
3. Your lab must have the following sections: Purpose, Materials, Procedure, Data collection, Data Analysis, Discussion, Conclusion, and References if applicable.
4. The data analysis must have a component that calculates acceleration of an object.
5. At least 1 graph must be produced, showing the relationship between your dependent (y-axis) vs. your independent variable (x-axis).
6. There must be at least 5 points on your graph.
7. Your group must identify and attempt to control your experiment.
8. Your experimental design should address your purpose and not attempt to measure something else.
9. Make sure you refer to the lab report rubric to check anything you missed.

**Guiding questions**

1. When a cart moves down the ramp, what is causing it to move this way? How could you make this cart move faster? Slower?
2. If you could create a velocity-time graph from your position-time graph, how could you use this new information? What other motions could you think of that is difficult to measure the velocity but easy to measure the position over time? What about the sports that you play? The hobbies you do outside of class?