SAINT JOSEPH'S PREPARATORY SCHOOL
PHYSICS LAB EXERCISE NOVEMBER, 2010

NAME: _____ DATE: _____ PERIODS: ____

COLLABORATORS: _____

Newton's Second Law of Motion (Part Two)

We will be attempting to verify that $\boxed{a \propto \frac{1}{m}}$. This is one part of the second law of motion.
Each group will run **eight** trials with different total masses and the same accelerating force.
Set up the equipment and add weight to the cart as instructed in the lab.
It is important that the weight on the string be a constant for all eight trials. The total mass of the system will be varied in this experiment while the accelerating force will remain constant.

Record the accelerating mass here: _____

Record the accelerating force here: _____

Follow the instructions given in the lab to determine the acceleration for each trial. Each student must do this measurement at least twice. Share the work.
A graph of acceleration vs. mass will reveal whether acceleration is proportional to mass. In addition, since the purpose of the experiment is to determine whether acceleration is inversely proportional to mass, a graph of acceleration vs. 1/mass should be plotted. If the second graph produces a straight line, then acceleration is shown to be inversely proportional to mass. If either graph produces a straight line, speculate about what determines the slope of the graph.
Each student must do a separate lab report from the same data.
Remember that the conclusion in your lab report must be supported by the data.

Using the Vernier Equipment and Logger Pro to Acquire Data and Analyze it.

- Open the Logger Pro Software.
- Choose FILE – OPEN and enter the following address:
  http://labs.sjpscience.org/nsecond2.cmbl
- Run the experiment as directed and take careful notes for the Procedure part of the lab report.
- Analyze the data according to directions in order to determine the acceleration from each trial. Take careful notes for the analysis part of the lab report.

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Trial	Mass of System (kg)	Δx_1 (m)	Δx_2 (m)	Small Time Interval (s)	v_1 (m/s)	v_2 (m/s)	Δv (m/s)	Large Time Interval (s)	Acceleration (m/s^2)	Student Initials
1										
2										
3										
4										
5										
6										
7										
8										

<u>This paper must be submitted with the lab report.</u>

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