Newton's Second Law

As you work through the steps in the lab procedure, record your experimental values and the results on this worksheet. Use the exact values you record for your data to make later calculations.

Part 1 - Data

flag length c:

mass of hanger M_{h}:

Complete the data table below.

Data Table 1

Trial #	m_1 (kg)	$m_1 g$ (N)	v_1 (m/s)	v_2 (m/s)	Δt (s)	a (m/s^2)
1						
2						
3						
4						

CHECKPOINT 1: Ask your TA to check your table values before proceeding.

Part 2 - Calculations

What are the slope and y-intercept of the plot of m_1g versus acceleration?

What is the total mass as calculated from the slope?

What is the percent uncertainty in the total mass?

What is the physical significance of the y-intercept?

What is the total mass M of your system as determined from the mass of the cart, weight hanger and added masses?

What is the percent uncertainty in M_{measured}?

What is the percent difference between the total mass determined from your graph and that determined by using a balance?

Do the two values of M agree within the range of your experimental uncertainty? (Consider your total masses and their uncertainties exactly as you have entered them.)

CHECKPOINT 2: Ask your TA to check your Excel worksheet and graph.