Make The Car Go

Goal: the purpose of this lab is to determine the mathematical relationship between the net force applied to an object and that objects acceleration.

We know that force on the cart will cause it to accelerate. If you change the force applied, how will that effect the carts acceleration? If you double the force, will it decrease the acceleration? If you double the force, will it double the acceleration? If you double the force, will the acceleration go up by a 4 times?

1. Title
2. Goal
3. Hypothesis
4. Procedure/Diagram
5. Data
6. Graph/Analysis
7. Conclusion

Task: You will perform a systematic approach to determine how force effects acceleration. Start with a hanging mass of about 25 grams. This hanging mass applies the force to the cart. Measure the carts change in velocity (acceleration) by recording the time to move a set distance. Remember, you should have multiple trials (3 minimum) per data point and you should have at least 5 data points.

Procedure: In the write-up, everyone should discuss and agree on how to explain the procedure. Also include a diagram of the situation.

Data table: Create two data tables. One to record the 12 time trials and one to show the data and calculations that will be graphed. Starting with this step, everyone should have this data so that you all can create your own graph.

Trial	Hanging Mass	**Graph on y-axis** Force on Cart	Distance	Average Time	**Graph on x-axis** Accel. of cart
	(kg)	Mass*accel. Due to gravity (N)	(meters)	(sec)	(m/s^2)
1					
2					
3					
4					
5					

Trial	Time 1	Time 2	Time 3	**Average time**
	(sec)	(sec)	(sec)	(sec)
1				
2				
3				
4				
5				

Table 1: All time data Table 2: Average data and calculations

Graph: Plot Force on Cart verses Acceleration on Cart. NOTE: normally, you would put the independent variable on the x-axis. For this lab put force on the y-axis and acceleration on the x-axis. This is not normal, but the reasons for this will be clear when we analyze the graph tomorrow. Finish for homework if you do not finish this during class.

Conclusion: What is the relationship between the net force on the cart and the cart's acceleration?