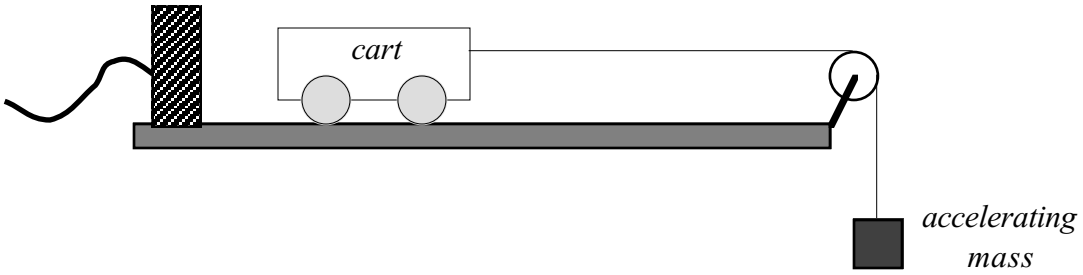
PHYSICS Name:

Lab - Newton's 2nd Law

Purpose: (+1)

Materials: (+1)

Picture of Apparatus: (+1)



Procedure: The effects of **changing the applied force** on acceleration (+1)

The effects of a **constant applied force** to an object of varying mass (+1)

Data:

Mass of cart: _____ (kg) (+0.5) Mass of hanger: _____ (kg) (+0.5)

Table #1 (tool uncertainty): (+4)
Table #2: (+4)

Analysis: ***Calculations***:
Find Weight (+1)
Find a_{theor} (+1)
Find %error (+1)

Graphs:
•Make a graphs of:
(i) **applied force vs. acceleration** (from Table 1) (+4)
(ii) **acceleration vs. mass** (from Table 2) (+4)
(iii) **acceleration vs. F/M** (M = total mass) (from Table 2) (+4)

Questions: 1. How does the shape of the graph (i) look? What does this imply about the relationship between force and acceleration when the mass is constant? (+1)

2. What is the slope of graph (i)? How does it compare to the total mass of the system (mass of the cart + mass of hanger)? Should they be the same? Explain. (+1)

3. How does the shape of the graph (ii) look? What does this imply about the relationship between acceleration and mass when the force is constant? (+1)

4. What is the shape of graph (iii)? What is the slope? Explain why the slope should be close to a value of "one". (+1)

5. The graph of force verse acceleration should pass through the origin (Why?). If it does not that means that there was some other force being applied that was not accounted for. What could this force be? (+2)

Error Analysis

Determine your percent error. How did your experimental values compare to the theoretical values (+1)? Discuss any sources of error in this lab and describe ways that you could improve the accuracy (+1).

Conclusion:

What did you do (+1)?
What did you find (+1)?
What generalizations can you make (+1)?