

Name: _____

Date: _____

Period: _____

Lab – Force & Acceleration

Question: How does acceleration change when the same force is applied to objects which have different masses?

Hypothesis (use the term directly or inversely proportional): _____

Procedure:

1. Gather Materials: Triple Beam Balance, 4-wheeled cart, 1-meter string, 1 large ball bearing, 3 weights, plastic cup, meter stick, masking tape, stopwatch
2. Mass cart & Record: _____
3. Mass ball bearing & cup together, Record mass: _____
4. Mass one weight & record: _____
5. Tie sting to cart and tape other end to cup
6. Set cart on table, run sting across table so cup hangs over the end opposite cart.
7. Set a start & stop line one meter apart.
8. Place ball bearing in cup & release
9. Measure time for cart to cover 1 meter, Record.
10. Repeat 4 times.
11. Add one weight to cart & repeat procedure.
12. Repeat procedure with 2 weights on cart.
13. Repeat with 3 weights.

Data:

Cart with	Trial 1	Trial 2	Trial 3	Trial 4	Average time
0 weights					
1 weights					
2 weights					
3 weights					

Data Analysis:

If gravity pulls with an acceleration of 9.8m/s^2 , What force did the cup & ball bearing apply to the cart during each trial?

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Data Analysis:

Cart with	Combined mass (Cart + weights)	Distance Traveled	Average Time (From Data)	Acceleration (see formula below)
0 weights		1 Meter		
1 weights				
2 weights				
3 weights				

Acceleration = distance ÷ (time x time) or $a = d/t^2$

Graph:

How does mass affect acceleration of an object when the force remains the same?

