Name _____ Date _____ Period _____

ACCELERATION – PART 2

PROBLEM: To demonstrate Newton's Second Law of Motion

QUESTION: What effect does an increase in mass have on the force needed to move an object?

HYPOTHESIS: (Use an if/then statement)

_____

_____

_____

MATERIALS:

- Cart
- 4 Weights
- Spring scale
- Paper clip
- Calculator
- Triple beam balance

PROCEDURE

1. Use the triple beam balance to find the mass of the cart. Record.
2. Use the triple beam balance to find the mass of the cart with 1, 2, 3, and four weights. Record.
3. Make sure the spring scale reads "0".
4. Attach the spring scale to the end of the card with a paper clip.
5. Pull the cart using the spring scale. Notice the force needed to pull the cart is measured in Newtons on the scale.
6. Measure the force needed to pull the cart across the table at constant velocity. Record.
7. Repeat for a total of 5 trials.
8. Pull the cart along the length of the table as quickly as you can. Record the highest measurement the spring scale shows while pulling the cart.
9. Repeat for a total of 5 trials.

10. Add a weight to the cart. Repeat steps 5 and 6.

11. Add a weight to the cart.

12. Repeat steps 5 and 6.

13. Add the third weight to the cart. Repeat steps 5 and 6.

14. Add the last weight to the cart. Repeat steps 5 and 6.

OBSERVATIONS:

DATA TABLE 1

Mass of Cart with Weights (gm)	Force (N)					Average Force (N)
	Trial 1	Trial 2	Trial 3	Trial 4	Trial 5	
0						
1						
2						
3						
4						

DATA ANALYSIS:

Make a line graph to show the relationship between the mass of the cart and the force necessary to move it. Remember to title and label your graph.

Before you begin:

What is the independent variable in this investigation? _____

Where does it go on a graph? _____

What is the dependent variable in this investigation? _____

Where does it go on a graph? _____

Before you begin graphing, have your teacher check your answers to the above question and initial here:

Graph your data using a bar graph. Remember to title and label your graph.

Title: _____

Describe the relationship between the mass of an object and the force it takes to move the object.

_____

_____

_____

ANALYSIS/CONCLUSIONS:

1. Write a paragraph, using complete sentences answering the original research question.

   Include:

   - Whether you hypothesis was supported by the data or not.
   - Actual Data from the experiment.