Physics   Name _____
Weight vs. Mass Lab Makeup   Date _____

Objective – Determine the mathematical relationship between weight and mass.

Materials –
- ☆ Spring scale (be sure that it initially reads zero. If it doesn't, please ask for assistance)
- ☆ Box set of masses.

This is the procedure your classmates followed to collect the data. Please see below for theoretical data.

Procedures –

1. Select a mass from the box set and hang it on the spring scale.
2. The masses in the box set are given in grams; however, we will be studying the relationship of the masses in kilograms to that of the resulting weight. **Convert the given masses in grams to masses in kilograms. The mass in kilograms will be graphed!**
3. Record the **weight in Newtons (N)**.
4. Choose another mass and repeat step 2. Continue this process until you have completed your data table.
5. Enter this data into a graphing program (Excel or Logger Pro). **Please change the column heading to reflect what is measured.**
6. Observe the data and determine which proportionality is best represented.

Data –

Mass (g)	Mass (kg)	Weight (N)
100		1
200		2
400		3.9
500		5
700		6.8
1000		10
1200		12

Analysis & Conclusions –

1. Indicate which of the above quantities (mass and weight) is the independent variable and which is the dependent variable. Explain how you determined this.

2. Draw a sketch of the graph.

3. Describe the mathematical relationship between the graphed variables.

4. What is the general & translated equations for the graph produced?

5. What numeric value was calculated for the slope resulting from this data? Is this number close to value we have seen and used in our last unit, if so what do we call that value?

Practice –

The equation that relates mass to weight is $Fg = ma_g$, *where* a_g *(acceleration due to gravity) is 9.8 m/s/s.*

1. A toy car has a mass of 2.5 kg. What is the car's weight?

2. A block of lead has a mass of 33 kg. What is the block's weight?

3. A block weighs 72.4 N. What is the block's mass?

4. A book weighs 8 N. What is the block's mass?

5. A car has a mass of 89.5 kg. What is the car's weight?