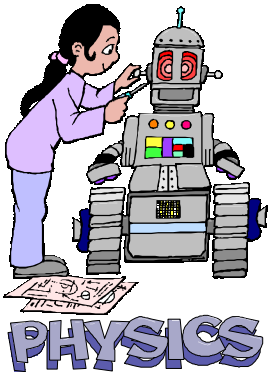
Science 9-Physics
Activity 19B—The Force of Gravity



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Name _____

Due Date _____

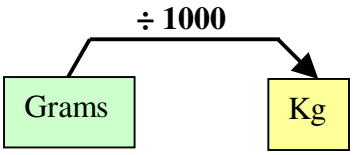
Show Me ☐ Hand In ☐

Correct and Hand In Again By _____

Purpose: To learn how to measure **forces** in **Newtons**.

Procedure:

1. Use the conversion:



to **convert** the Mass in **grams** to Mass in **kg** for each mass in the data table below:

Mass (g)	Mass (kg)	Force of Gravity (N)
100		
200		
500		
1000		

2. Using the spring scales as directed by the teacher, measure the **Force of Gravity** in **Newtons** (N) for each of the masses in the table. Record your readings under "Force of Gravity" in the table above.

3. Plot of graph of Force of Gravity (N) vs. Mass (kg) using the directions given on the handout "**Science 9—Excel Graph for Experiment 19B**" . Ask the teacher for this handout and give it back after you're finished. Print a copy of the graph for each person in the group. **When you have finished the lab, staple the graph on the back of your lab report.**

Questions:

1. Using the line on your graph, determine how many **Newtons of gravitational force** pull down on each of the following masses. Your teacher will show you how to use the graph to do this.

	Mass of Object	Force of Gravity
a.	0.3 kg	N
b.	0.65 kg	N
c.	0.7 kg	N
d.	750 g = _____kg	N
e.	900 g = _____kg	N

2. How much **mass** would be required to exert a **force** of 1 N on your hand?

Answer _____ **kg = _____ grams**

3. What is the **force of gravity** on a 5 kg bag of flour?

Answer _____**N**

4. a. **1 kg** would have a **force of gravity** of about _____ **N**.

   b. Would 1 kg have the **same force of gravity** on the **moon** as it does on the **earth**?

Answer _____

Give a reason for your answer.

   c. If an object has a **mass of 1 kg** on the **earth**, what do you think it's **mass** on the **moon** would be? (Be careful!)

Answer _____

5. **Use your answer to question 4a** to determine the **force of gravity (N)** on each of the following **masses**:

	Mass of Object	Force of Gravity
a.	10 kg	N
b.	20 kg	N
c.	2500 g = _____kg	N
d.	15 000 g = _____kg	N
e.	A 65 kg person	N
f.	An 80 kg person	N

6. Look up "mass" in the glossary of your textbook. Define it here:

   Mass –

7. The term "**weight**" also means the **force of** _____ on an object.

8. If you were to go to the **moon**, would your **mass** change? _____

   Explain how you got your answer:

9. If you were to go to the **moon**, would your **weight** change? _____

   Explain how you got your answer:

10. Where do you think you would weigh **more** than you do on the earth?_____

11. What is a person's **weight** in an orbiting space shuttle? _____