Physical Science Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Lab #16 – Determining Buoyant Forces Period \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Allen

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**Problem:** How does the buoyant force determine whether an object sinks or floats?

**Procedure:**

1. Use the data table provided on the back of this sheet and fill it out completely.
2. Take a spring scale and a 100 g mass, 200 g mass or a rock. Measure the weight in Newton’s and put your answer on your data table. ***Weight (N) = mass(kg) x gravity (m/s2)***
3. Use an overflow can and fill it to the brim with water.
4. Next, measure the weight of the mass under water in Newton’s. Make sure to collect the overflow water in a container for procedure #5.
5. Measure the volume of the displaced water in milliliters using a graduated cylinder.
6. Now determine the weight of the water in Newton’s.
7. Use the remaining masses 100 g, 200 g or the rock and follow the same instructions previously mentioned.
8. Finally do the last remaining mass or object.

**Lab Report: complete on Microsoft word or excel spreadsheet.**

1. What force is responsible for the pushing of objects up against the force of gravity in this lab?
2. How is the buoyant force related to the weight of water being displaced?
3. Explain what causes an object to sink or to float, using the terms *buoyancy, weight, force, density,* and *gravity.*
4. Make a double column graph comparing the “Buoyant Force” to the “Weight of Displaced Water” for all three items. Make sure to include a title, key, and labels.
5. Make a double column graph comparing the “Weight in Air” to the “Weight in Water” for all three items. Make sure to include a title, key and labels.
6. Determine the density of your rock that you used in your lab. Can you identify what type of rock it is using its density and its physical characteristics. Use the following table and look up characteristics of your rock online.

|  |  |
| --- | --- |
| **Sandstone** | **2.0-2.6** |
| **Shale** | **2.0-2.7** |
| **Limestone** | **2.5-2.8** |
| **Granite** | **2.5-2.8** |
| **Basalts** | **2.7-3.1** |
| **Metamorphic Rocks** | **2.6-3.0** |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Object** | **Weight in Air (N)** | **Weight in Water (N)** | **Buoyant Force**  **(Formula = Weight in Air – Weight in Water)** | **Volume of Displaced Water (ml)** | **Weight of Displaced Water (N)** |
| **100 g mass** |  |  |  |  |  |
| **200 g mass** |  |  |  |  |  |
| **Rock** |  |  |  |  |  |