**Identifying Properties of Matter** Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Objective:** In this experiment you will identify the physical properties of a number of objects provided by your teacher. You will calculate the density of several objects, and then when provided with the density of different substances attempt to state the object’s composition.

**Procedure**:  
1. Fill in the physical properties of the object in the data table.

2. Calculate the mass of each object by using the scale or balance.   
3. Next, calculate the object’s volume using the displacement method described below:   
a. Pour water into a graduated cylinder or beaker, and record the volume of water in the container on the data table.   
b. Place the object in the container and note the new level of the water. Record the value in the data table.   
c. To obtain the volume of the object subtract the initial volume of water from the volume of water after the object was placed in the container.   
4. Calculate the density by dividing the mass by the volume.   
5. Listed below are the densities of various objects. Using this list, match the density you calculated to the density of the materials in the chart. Write your guess as to what the mystery substance/item is in the object column.

Aluminum: 2.7 g/ml Brass: 8 g/ml Copper: 8.9 g/ml Steel: 7.6 g/ml Oak: 0.6-0.9 g/ml Pine: 0.35-0.6 g/ml Poplar: 0.35-0.5 g/ml Acrylic: 1.16-1.19 g/ml PVC: 1.39- 1.42 g/ml Nylon: 1.13 g/ml Water: 1.0 g/ml **Data Table:**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Object** | **Mass** | **Volume in Container before object** | **Volume in Container after object** | **Volume of Object** | **Density**  **(Density = Mass/Volume)** | **Color** | **Texture** |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |

**Conclusion**: Write a paragraph describing the more difficult physical properties to identify when working with your objects. Describe how your descriptions may be unreliable, and describe what other properties may be useful in describing the objects. Describe any problems you encountered when performing the measurements and calculations. How could you have made your measurements more precise? What are some other methods that could be used to identify the composition of matter in objects?

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Today we will be using properties of matter to identify unknown substances. Get the sheet from the desk and make a group of three. Sit with them. Read over the lab sheet for today. You will need a calculator each and a pencil. Explain to your group makes why some objects float in water and why others sink.

