**Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date:\_\_\_\_\_\_\_\_\_\_\_**

6th Grade Physical Science Period \_\_\_\_\_\_\_\_\_\_

**Calabrese/Marcinek/McCaffrey**

**Will It Float?**

***Density*** is a physical property which explains why objects that are the same size can have very different weights. Density is defined as the amount of matter (mass) contained in a specific amount of space (volume). In other words, density = mass/volume. *(d=m/v)* Every type of matter has a characteristic density. That means objects of the same type of matter have the same density as each other.

First, let’s measure the mass and volume of water to calculate the “characteristic” density of water.

|  |  |
| --- | --- |
| **Volume of the Water** |  |
| **Mass of the Water and Cylinder** | **+** |
| **Mass of the Cylinder** | **-** |
| **Mass of the Water** | **=** |
| **Density of Water** | ***m/v*** |

***Volume*** is the amount of space an object takes up. The volume of a cube is equal to the length of one side to the third power. Use a ruler to measure the length of one side of a cube and multiply it three times (to the third power). Each cube is the same size and therefore will have the same volume.

Use the formula below to calculate the volume of the cubes. Record it in the Volume column on the chart on the opposite side of the page.

\_\_\_\_\_\_\_\_\_ (1st side) X \_\_\_\_\_\_\_\_ (2nd side) X \_\_\_\_\_\_\_ (3rd side) = volume of the cubes

***Buoyancy*** is a physical property we use to determine whether and object will float in a liquid or rise in a gas. To determine the buoyancy of an object in another substance, we must compare the density of the object and the other substance. If the object’s density is less than the substance it is placed in, it will float. If it is greater than the substance it will sink.

Use the chart on the below of this paper to;

1.) Calculate the density of each cube

2.) Predict if it will float (Yes or No)

3.) Record your data in the proper column

4.) Place the cube in the water and observe- ***Do Not Let The Wooden Cubes Sit In the Water too long. They will absorb the water and change the density of the cube.***

4.) Circle your prediction if it is correct.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Substance** | **Mass (g)** | **Volume (cm3)** | **Density g/cm3** | **Will It Float?** |
| Copper | 139 |  |  |  |
| Brass | 125 |  |  |  |
| Steel | 118.8 |  |  |  |
| Aluminum | 42.2 |  |  |  |
| Acrylic | 18.1 |  |  |  |
| Oak | 11.7 |  |  |  |
| Nylon | 17.7 |  |  |  |
| Pine | 7.8 |  |  |  |
| Poplar | 6.7 |  |  |  |
| PVC | 21.9 |  |  |  |
| Polypropylene | 14.1 |  |  |  |
| Lignum Vitae | 20.8 |  |  |  |

**Conclusion:**

1. What determines whether a cube will float or sink in water?

2. Describe how you determined the volume of the cubes.

3. Describe how you determined the density of the cube.