

“To Float or Not to Float”

In this activity two blocks and two candy bars will be compared through their physical properties of mass, volume, density, and buoyancy. Each of these properties will be measured for the blocks and the candy bars. The purpose of this activity is to gain experience measuring to the proper number of significant figures as well as gaining some insight into being able to predict buoyancy from density.

Materials and Equipment:

- * A wood block and a metal cylinder
- * Snickers Candy Bar
- * Three Musketeers Candy Bar
- * Ruler
- * Scale
- * Beaker of Water

Procedure:

I. Wood and metal objects

1. Measure the dimensions of each object.

<u>wood block</u>	<u>metal cylinder</u>
Length _____cm	Diameter _____cm
Width _____cm	
Height _____cm	Height _____cm

2. Measure the mass (in grams) of each object.

wood _____g metal _____g

4. Calculate the volume using LWH for the wood block and $\pi R^2 H$ for the cylinder.

Wood block volume: _____cm³

Metal cylinder volume: _____cm³

5. Now calculate the density of each block using the following relationship:

$D = M/V$ where D is density, M is mass, and V is volume. Show work out to the side.

Wood block density _____g/cm³

Metal cylinder density _____g/cm³

II. Candy bars

1. Unwrap each of your candy bars.
2. Measure the length, width, and height of each bar.

	<u>Snickers</u>	<u>3 Musketeer</u>
Length	_____cm	_____cm
Width	_____cm	_____cm
Height	_____cm	_____cm

3. Measure the mass (in grams) of each candy bar.

Snickers_____g 3 Musketeer_____g

4. Calculate the volume using $L*W*H$.

Snickers Volume: _____cm³

3 Musketeers Volume: _____cm³

5. Now calculate the density of each bar using the following relationship:

$D = M/V$ where D is density, M is mass, and V is volume. Show work out to the side.

Snickers Density _____g/cm³

3 Musketeer Density _____g/cm³

5. Feel of both rocks. Which feels heavier?

Obtain the mass of both rocks on the large triple beam balance.

small rock _____

large rock _____

Why are your results surprising?

6. Look at the soda cans in the container of water.

Which can is floating? _____

Which can is sinking? _____

From what you have learned in lab today about density, what is the reason for the floating and sinking (in terms of density)?

Research and find what substances are different in these two cans that would cause this difference in density (and thus floating and sinking).