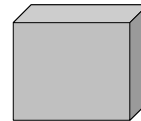Name: _____ Period: _____ Date: _____
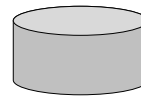
Will it Float? (5 pts + ??? bonus)

You will be given a small, airtight container. Your challenge is to figure out exactly how many pennies you need to make your container sink in water.

Procedure

1. Find the volume of your container.
    A. If it's rectangular, measure each dimension and multiply them: $V = l \cdot w \cdot h$.
    B. If cylindrical, measure the height and radius: $V = \pi \cdot r^2 \cdot h$.
2. The density of water is 1 g / 1 cm^3. Find out what mass your container would need to match that density. This is your <u>TARGET MASS</u>.
3. Measure the mass of your empty container (with its lid).
4. Add pennies until you just barely go over your target mass. Record your data.
5. Take out the last penny, and record data again.
6. Close your container and take it to Mr. Stonebraker for testing!!

$$V = l \cdot w \cdot h$$

$$V = \pi \cdot r^2 \cdot h$$

At this point, your container should be just under your target mass and should float in the tank. If you put the last penny back in, you should be over your target mass and it should sink.

Scoring

Your work and calculations on the back of this sheet are worth 5 points, whether or not you succeed at the challenge.

If your number of pennies is close to the correct number, you may earn up to 5 bonus points. The closer you are, the more points you get!

- Within 5% of ideal number of pennies: 5 bonus points.

- Within 10% of ideal number of pennies: 3 bonus points.

- Within 15% of ideal number of pennies: 1 bonus point.

To get a better result, make your measurements as <u>precisely</u> and <u>accurately</u> as possible. Sloppy measurements will not be good enough.

<u>You only get one try and you may not test your container ahead of time.</u>

Each student must turn in their own lab sheet for the regular points. If you get bonus points, everyone in your group will get the same number of bonus points.

<u>Measure carefully! You must be accurate and precise to succeed!</u>

Work space

1. Find the volume of your container by filling in the appropriate column here:

Rectangular	Cylindrical
length:	radius:
width:	height:
height:	
$V = l \cdot w \cdot h =$	$V = \pi \cdot r^2 \cdot h =$

2. The density of water is 1 g / 1 cm³. In this space, use that density as a conversion factor to convert the volume of your container into a mass. This is your <u>TARGET MASS</u>. Record the target mass in the table below.

$$target\ mass = volume \cdot \left(\frac{1\,g}{1\,cm^3} \right)$$

3. Measure the mass of your <u>empty container</u> (with its lid) and put that value in the table below.

4. Add pennies until you just barely go over your target mass. Record this number of pennies and the mass in the "just-over" boxes in the table.

5. Take out the last penny so you are just below your target mass. Record this number of pennies and the mass in the "just-under" boxes in the table.

6. Close your container and take it to Mr. Stonebraker for testing!!!

Target mass:	Empty mass:

Just-over penny #:	Just-over mass:
Just-under penny #:	Just-under mass:

FOR OFFICIAL SCORING USE ONLY
Ideal just-over penny #: