

EXTRA CREDIT HOMEWORK: CARTESIAN DIVER

AME _____

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-- (Optional--extra credit) **Building the miraculous Cartesian Diver**

Materials:

- 1 straw
- 1 plastic bottle with a screw top (It's best if the bottle is a quart or bigger and clear)
- 1 piece of tape (scotch tape is good)
- 1 penny
- Water

Procedure:

1. Bend the straw in half.
2. Tape the penny onto the end with the two holes. (See illustration)

Be careful not to block the holes. This is your diver

3. Fill the plastic bottle to the very top with water.
4. Put the diver into the bottle penny side down.
5. Screw the top onto the bottle, and squeeze the bottle.

6. If your diver doesn't dive right away, it might be a little bit too light. You want the diver to be just dense enough so that when you complete step 4, almost none of straw is sticking out the top of the bottle (see illustration). You can increase the density by squeezing some water into the straw as you put it into the bottle. (You can also add more weight or shorten the straw.)

7. For credit, bring your working diver to school. Illustration (below)
and complete the analysis. Be sure your name is on the diver some where.

Analysis:

1. What must happen to the density of the diver or the water for the diver to change from a floater to a sinker?



2. How does this change in density occur?

If your not sure, guess.

For extra-extra credit, build a Cartesian Diver out of different materials. How wacky a diver can you build?

For more extra credit find your mass (your weight divided by 2.2 = your mass in kg. Your mass in kg \times 1000 = your mass in grams) Your volume (use volume displacement in a bath tub. 1 gallon = 3,780 cc), and calculate your density.