

Homework #7 – Due 3/25 beginning of class

If you have any questions about the homework, feel free to email me: sawtelle@umd.edu

I've been pressured (haha) to make this homework a bit easier than usual in honor of spring break. So I'm doing that – there's one question about where we were in class at the end of the day on Wednesday, and one question that is asking you to reflect on this class.

1) Measuring Pressure

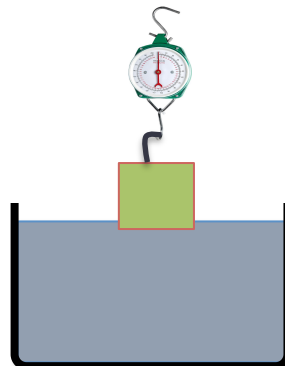
On Wednesday in class, I started us off on the story of Archimedes – who observed that the fluid displaced by his body in the bathtub was equal in volume to his body – and then I proposed we test Archimedes' idea and think about how this could help us understand how to measure pressure. At the end of class most of you agreed on these ideas:

1. **The amount of water displaced is equal to the volume of the object that is under the water.**
2. **The amount of water displaced does not change with the weight of the object, only with the volume of the object.**
3. **When an object floats, the weight of the object is equal to the weight of the water that is displaced (measured by measuring the volume of water that was displaced).**

We connected these ideas to the things people were saying where for a floating object the pressure of the water pushing up is either greater than or equal to the pressure of the object pushing down. What I'd like you to answer in this essay is how the rules from above help us make progress on measuring water pressure (note – we have not tried to measure air pressure at this point, but you might have ideas about this after today). What do you think? Have we measured pressure? What evidence do you have that we're getting closer to measuring water pressure?

2) Predicting the weight

Imagine that I had a scale that you can hang stuff from (like in the produce aisle of the grocery store). Now imagine that I hung an object like our wooden cubes, or an apple, off that scale and slowly lowered it into the water.



What do you think the scale would read before the object got to the water? As the object entered the water? How would it change as the object got lower? Now repeat the process with a heavier object like one of those metal cylinders that you all were sinking in the tanks. What would the scale read then? How would it change as I lowered it into the water? As you work through this example try to make sure your connecting your reasoning to your ideas about pressure and floating/sinking.

3) What is it that we're doing in this class?

Imagine that you had to explain what this class is about. Sure, we've been investigating sinking and floating, and we do "experiments" and play with things to see if they'll sink and float. But don't just make a laundry list of things that we've done in class. I want to know more about the spirit of this class. What are the purposes and goals driving what we do in class?

First, take some time before you start writing to think about what we do. Reflect and try to sum up the spirit of this class. Then, write for someone not from this class, explaining the most important features of this course. These might include:

- What is our goal?
- How do we try to accomplish that goal?
- What kind of ideas about sinking and floating do we want to come to (or not come to)?
- When do we decide that we "get it?"
- What do you and your classmates do? What does Eric, Jenna, and Gabby do?
- Or something else!