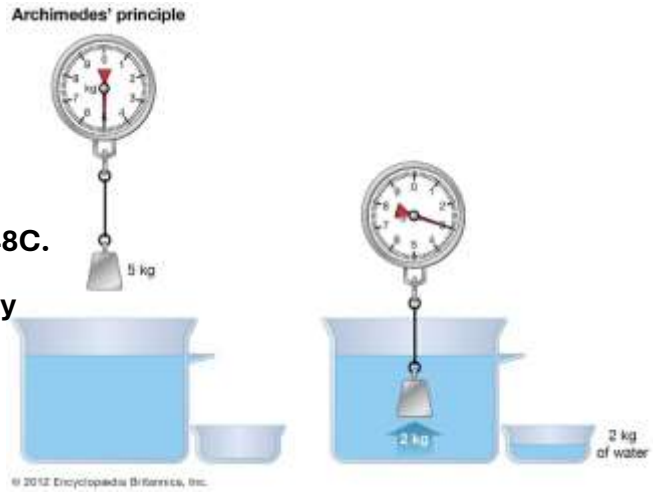

Manual to Lab 4: PHY2048C.

Florida State University

Archimedes

About labs in this class

The labs in this class will have general instructions, and many things need to be figured out by the students. I will be answering any specific questions the students may have without completely giving away the key to the puzzle. **Answer the questions and record your measurements in your lab notebook and then submit the notebook at the end of the activity.**

About this lab

In this lab you are provided with tools with which you can devise up to **five methods** to determine the density of objects using the Archimedes principle. Archimedes invented this method to measure the density of gold vs. fake gold. (Hint: note these springs are the ones for which you already know the spring constant k. Use that knowledge. Also, the density of water is 1 g/cm^3)

Question 1. Draw a free-body diagram of the submerged coin in figure 14.23 of your book, which is at equilibrium.

Activity 1. Measure the density of the provided weights to a 10% accuracy (at least a 10% error bar). *Use at least three different methods*.

Question 2. Compare your results of the different methods. Can you explain the discrepancies between them? Identify sources of measurement and systematic errors in these experiments.

Question 3. Why do certain things float, and certain things don't float.