

Postlab 4: Archimedes' Principle

- 1) If the water in which you submerged the rock was heated to 85°C , what should change in your calculations for the density of basalt?

- 2) What do you know about the temperature of the water of your experiment? What is the minimum and maximum density of water you might have to assume?

- 3) The rock that we had in lab was slightly porous. Explain clearly how this affects your calculation for the density of basalt? What errors does this introduce?

- 4) By ignoring the mass and volume of the net surrounding the rock, what errors are we introducing? If this were the only experimental error, do you expect the value of your density to be above or below the expected density? Explain clearly.

- 5) For each of your measured values use the ones that result in a large value of the density of the rock and in your lab book calculate the density. Then take all values that result in a low value for the rock density and calculate that value. Communicate the range for the rock density that you determine based on your measurements and calculations.

- 6) In a moment of interest in historical reenactment, you decide to repeat Archimedes' experiment and determine the density of a candle holder. You suspend it from a spring scale and the scale reads 8.0 N. You then lower the holder into a tub of water so that it is completely submerged, the scale reads 5.0 N.
 - a) What is the volume of the candle holder?
 - b) What is the density of the candle holder?
 - c) What does the scale read when the holder is 75% submerged in water?

Start your solution in your lab book with a picture and a free body diagram.