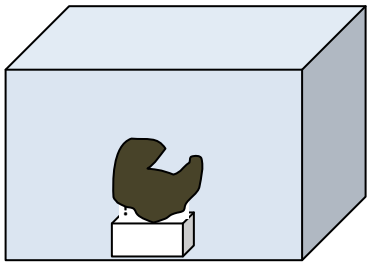
Quiz #13

1. If a person measures their blood pressure in the following two positions, the readings will be
   A. Higher for A
   B. Higher for B
   C. The same at both positions.

2. What is the pressure difference between two points in a container of water 0.20 m from the surface of the water and 0.50 m from the surface? Clearly specify at which point the pressure is higher.

3. An empty rubber balloon has a mass of 0.0070 kg. The balloon is filled with helium at a density of 0.179 kg/m^3. At this density the spherical balloon has a radius of 0.300 m. If the filled balloon is tied down by a vertical string, what is the tension in the string? Include a free body diagram. Volume of a sphere is 4/3 πr^3

4. A student demonstrates that a large misshapen rock of mass 6 kg sinks. The student carefully measures the increase in water level when the rock is placed in the container and determines the volume of water that the rock displaced is 0.0053 m^3.
   a. What is the mass of the water that is displaced?
   b. Draw a free body diagram of the situation
   c. What apparent weight would a scale that is sitting on the bottom of the container measure for the submerged rock?



$\rho = m/V$ $\quad p = F/A$ $\quad p = p_o + \rho g d$

$F_b = mg = \rho V g$ $\quad \Sigma \vec{F} = m\vec{a}$ $\quad g = 9.8 \text{m/s}^2$

1 atm = 1.013 x 10^5 Pa density of air = 1.29 kg/m^3 density of water = 1000 kg/m^3