Under Pressure

Directions: Go to http://phet.colorado.edu Simulation: Under Pressure

1. Explore the simulation my moving the pressure gauge to find out how pressure changes in air and water. Describe your findings and include specific data from your explorations to support your ideas.

2. Add another gauge to compare the pressure at sea level to the bottom of the pool. Is this consistent with your observations in part 1?

3. Turn the atmosphere off and compare the pressure at sea level to the bottom of the pool. Are the values consistent with your data in part 2? If not, explain why they have changed.

4. How does the shape of the pool affect pressure at the bottom? Try the "slanty" pools. Explain your findings.

5. How does the density of the fluid affect the pressure at the bottom? Explain what you did to answer this question.

6. Now try a quick 3 part experiment. Fill the pool and shut off the atmosphere.

I. Measure the pressure of the water at a depth of 1 m, 2 m and 3 m. Explain any patterns.

II. Put the gauge at a depth of exactly 1 m (it should read 9.8 kPa). Now change gravity to 4.9 m/s^2 and then 19.6. Explain any patterns.

III. Put the gauge at a depth of 1 m and set gravity back to 9.8. Change the fluid density to 700 kg/m^3 and 1400 kg/m^3. Explain any patterns.

7. Summarize experiments I,II,III by stating what factors affect pressure and whether the effects are direct or indirect.

8. Convert your written answer in 8 into an equation (i.e. P = ...). Test your equation to predict the pressure at the bottom of the rectangular tank of seawater of density 1030. Show all of your work including units.