

Exploring Pressure Underground Sim Lab

Directions

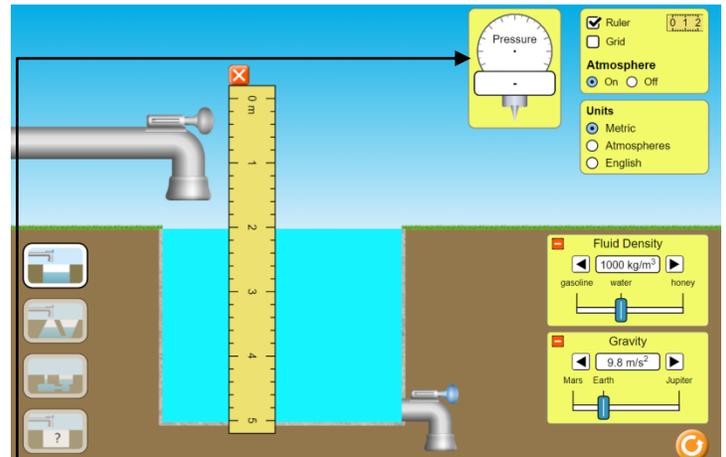
1. Go to the PhET simulation "Under Pressure"

<https://phet.colorado.edu/en/simulation/under-pressure>

2. Push the big Play arrow.

- a. Start with the default settings.
- b. Fill the tank with water.
- c. Turn on the Grid and play with the Ruler.
- d. Use the Grid to get you data table measurements.

3. Click on the **pressure gauge** to move it toward the water. Measure the pressure in the water at every 0.50 m from the surface to the bottom.



Data Table

Depth (m)	Pressure (kPa ¹)

4. Use Excel, or similar and create a graph with depth on the x-axis and pressure on the y-axis.
5. Copy and paste your graph below.

¹ unit of pressure and stress; a pascal is a pressure of one newton per square meter, or, in SI base units, one kilogram per meter per second squared.

6. Which variable is the independent variable (x-axis)? _____
7. Which variable is the dependent variable (y-axis)? _____
8. What is the physical meaning of the slope? _____

9. What is the physical meaning of the y-intercept? _____

10. What is the relationship between depth and pressure?
• As _____ increases, then _____ increases. Why do you think this happens?

11. Now, pick a depth and vary the fluid density from 700 to 1,400 kg/m³. Record your results on the table below. Note that the simulation will give you kPa. Convert to Pa before entering the values on the table. My chosen depth was: _____.

Density (kg/m ³)	Pressure (Pa = N/m ²)

12. Use Excel, or similar, to make a graph of pressure vs density. Copy and paste your graph and equation below.

13. What is the physical meaning of the slope? _____

14. What is the physical meaning of the y-intercept? _____

15. Based on what you learned in this activity, what is the formula for determining the pressure in a fluid?
State what each of the symbols mean.