Manometer Pressure Comparison

Use liquid levels to compare two pressures

Name _____ Period _____ Date _____

Find which side has greater pressure and use the liquid-height difference to calculate a pressure difference.

About 25 to 30 minutes | buildphysics.com/?experiment=fluid-manometer

Which side has greater pressure

1. Work while paused. Select Tank manometer. In Explore this setup, keep Measuring liquid density at 1000 kg/m³.

2. Set the left and right chamber pressures to each pair below. Enter pressures in Pa. Read Left liquid height and Right liquid height in Live values.

Left pressure (Pa)	Right pressure (Pa)	Left height (m)	Right height (m)
101325	101325		
103325	101325		
101325	103325		

3. When both chamber pressures are equal, how do the liquid levels compare?

4. On the side with greater chamber pressure, is the liquid level higher or lower? Use a trial as evidence.

5. Sketch the tube when the right chamber has greater pressure. Label the higher-pressure side and both liquid levels.

Calculate the pressure difference

For one measuring liquid, the pressure difference is $\Delta P = \rho g \Delta h$. Here Δh is the positive difference between the two liquid heights, ρ is the measuring liquid density, and $g = 9.8\ m/s^2$.

6. Set Left chamber pressure to 110000 Pa, Right chamber pressure to 101325 Pa, and Measuring liquid density to 1000 kg/m^3.

Record both liquid heights. Find Δh and calculate ΔP in Pa. Show your work.

7. Convert your result to kPa by dividing by 1000. Compare with the displayed Left − right pressure.

Try a denser measuring liquid

8. Keep the chamber pressures fixed. Predict how doubling the liquid density will change the height difference.

9. Set Measuring liquid density to 2000 kg/m^3. Record both heights and calculate the new height difference.

Measuring liquid density (kg/m^3)	Left height (m)	Right height (m)	Height difference (m)
1000			
2000			

10. Did the pressure difference change? Explain why the height difference changed.