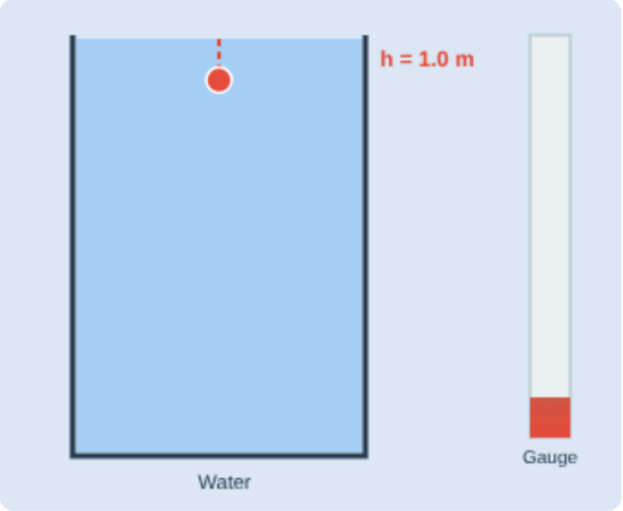
Pressure in a Liquid

Aim: You are investigating how the pressure in a liquid changes with depth, and how it depends on the density of the liquid.

Drag the **Depth** slider to move the sensor deeper into the liquid



The gauge and **Total Pressure** reading show the pressure at the sensor

P = ρgh

Pressure (Pa) = Density (kg/m³) × g (m/s²) × Depth (m)

Total pressure also includes atmospheric pressure (101 325 Pa)

Method:

1. Choose a liquid from the dropdown menu, e.g. Water. Leave **g** at 9.81 m/s² and **Container width** at 100% for now.
2. Set the **Depth** slider to 0 m. Record the depth and the **Total Pressure** reading in your results table.
3. Increase the depth in steps of about 2 m, recording the **Total Pressure** at each depth. Take at least 6 readings.
4. Change the liquid and repeat the same set of depths, recording a new set of readings.
5. Repeat again for a third liquid so you can compare at least three liquids of different density.

Prediction:

What do you think will happen to the pressure as depth increases? Do you think a denser liquid will give a bigger or smaller pressure at the same depth?

Results:

Liquid	Depth (m)	Total Pressure (Pa)

Analysis:

Plot a graph of **Total Pressure** against **Depth** for each liquid, on the same axes.

What pattern do you notice? How does the density of the liquid affect the gradient of the line?

Extension:

Use the **g** slider to see how the pressure would differ on the Moon ($g \approx 1.6$ m/s²) or Jupiter ($g \approx 25$ m/s²) for the same depth of water.

Now try changing the **Container width** slider at a fixed depth. Does the pressure change? What does this tell you about how pressure in a liquid depends on the shape of the container?