

## INSTRUCTIONAL GUIDE

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## Background

Pascal's Demonstrator consists of a vertical glass bulb about 3.5cm in diameter with small openings along one circumference and a branch tube containing a tight-fitting piston. It is designed to show that pressure in a fluid is transmitted equally in all directions.

In short, the apparatus is filled with water, and when the piston is pushed in, a stream of water is projected from each of the openings with the same force, showing that the pressure is transmitted in all directions.

## Operation

1. Fill a large beaker or other container with water.
2. Immerse the bulb in the water and, starting with the piston at its lowest position, pull the piston upward. Atmospheric pressure will force the water into the openings and fill the bulb.
3. A few rapid pumps of the piston may be necessary to completely fill the bulb and the cylinder.
4. When the apparatus is filled it may be quickly taken from the water and the piston pressed against the liquid, forcing streams of liquid out in all directions.
5. The apparatus may be held in any position to produce this result, but perhaps the horizontal position is best. In this position, students will observe that the streams of water are projected about the same distance from the bulb and that, therefore, is a rough measure of the amount of force, thus verifying that the liquid pressure is transmitted in all directions.

Alternatively, the apparatus may be filled by removing the piston from the apparatus and filling from a faucet. However, with this method, some water will be lost before you can begin the demonstration. Using a vessel as described will allow you to begin the demonstration immediately after filling.

## Related Products

**Gas Laws and Pressure Discovery Bundle (P1-2070)** Don't just teach the gas laws. Let students deduce them with these exploratory activities!

**Pressure Globe (P1-2015)** Demonstrate the amazing power of air! This specialized bottle is fitted with a balloon and a stopper. Inflate the balloon with air or water, with the stopper in place and removed, and see what happens.

**Atmospheric Mat (P1-2010)** A simple design that demonstrates a powerful concept: atmospheric pressure! Place this rubber mat on any flat surface and pull on the handle. It's like the mat is glued down!