

611-2240 (30-130) Pascal's Ball

Warranty:

We replace all defective or missing parts free of charge. Additional replacement parts may be ordered toll-free. We accept MasterCard, Visa, checks and School P.O.s. All products warranted to be free from defect for 90 days. Does not apply to accident, misuse or normal wear and tear. Intended for children 13 years of age and up. This item is not a toy. It may contain small parts that can be choking hazards. Adult supervision is required.

Introduction:

Pressure, is the quantity of force per unit area. For fluids, the force is considered to act perpendicular (or normal) to the area of action.

Pascal's Law states that changes in pressure in fluids is transmitted equally in all directions to all parts of a fluid. In our demonstration, the plunger applies pressure to fluid in the ball. The fluid follows pascal's law, and exits the ball with equal force in all directions. The reason for this is that fluids can flow and transmit the force *throughout* the fluid, as it presses perpendicularly on the walls of the container. An example of this applies when you squeeze a tube of toothpaste or a pastry bag. The hydraulic pump is also an example, where the pressure applies to a fluid (hydraulic oil) is evenly distributed throughout the system.

Gravity presents an interest-

ing case. In open fluid systems, air pressure exerts an even downward force on the fluid. According to Pascal's Law, the pressure for a given height of liquid yields the same pressure, regardless of the area of the fluid or the shape of the container. As a result, we can predict pressure in lakes and oceans a function of depth and air pressure regardless of the inherent shape of the body of water. This remains true from the largest oceans to a cup of coffee.

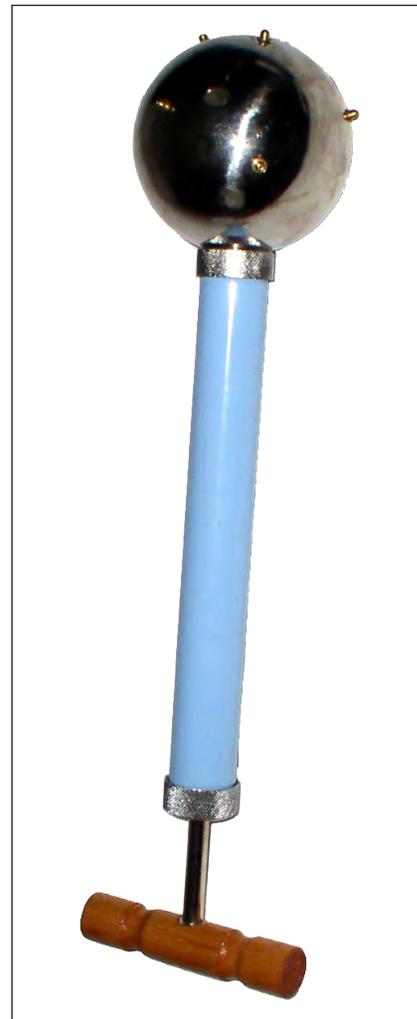
Care and Storage:

The 30-130 Pascal's ball should be drained of water and kept in a cool dry place when not in use.

The plunger may be lubricated with vacuum grease if it becomes difficult to operate. Unscrew the caps at the ends of the center tube to access the plunger.

How to use:

1. This demonstration will spray water up to ten feet in all direction. Be sure to locate somewhere that can get wet.
2. Fill a sink or bucket with cool to lukewarm water. There must be enough water to fully submerge the ball at the end of the apparatus.
3. Due to the small size of the jets in the ball, the pump must be slowly filled with water. Gently pump the handle in and out five times to help purge air from the ball.
4. Take one final pull of the handle until it is fully extended. At this point the ball should hold enough water to perform the demonstration.
5. In an open area, push the handle into the main tube. Try to



- use even pressure on the handle.
6. Observe how the water leaves the ball, and how far each stream travels.
7. Repeat the experiment, however during the final push, try to vary the pressure applied to the handle. Discuss the results.

P/N 24-2130

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