

Cartesian Diver Apparatus 305-1

Warning:

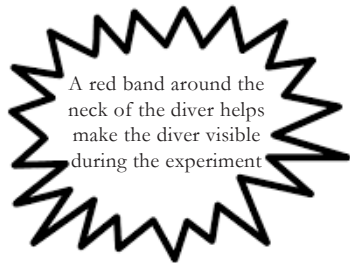
- **Not a toy; use only in a laboratory or educational setting.**
- **Contains latex**
- **Choking Hazard- small parts**



Introduction

The Cartesian Diver Apparatus is a visual demonstration of buoyancy and atmospheric pressure. It is used in illustrating phenomena such as the transmission of pressure through liquids, buoyancy (Archimedes' Principle), and the compressibility of gases.

The diver unit is 2.5" tall, made of hand-blown glass. It rises and falls in the cylinder of water as pressure is increased or decreased. There is a small hole at the end of the unit to allow air to be expelled and the water to flow in until its specific gravity is such that it just floats, though almost entirely submerged.



Included:
1 Cartesian Diver
1 Hydrometer Cylinder
1 Rubber Sheet
1 Rubber Band



Experiment: Transmission of Pressure

1. Fill the glass cylinder with approximately 215 ml of water. (Fill to within 1 inch from the top of the cylinder).
2. Hold the end of the diver under running water to partially fill it. Adjust the specific gravity so that the diver unit floats; it should not sink when released. If the diver unit will not float, place it under hot water briefly, and then place it back into the cylinder. If the diver draws in too much water, shake the unit to eliminate the excess.
3. Transfer the diver unit to the cylinder of water.
4. Stretch the rubber sheet over the cylinder's opening and secure with the rubber band.
5. Push down (with two fingers) on the sheet and observe the reaction of the diver unit.
6. Release the pressure on the rubber sheet. What happens to the diver?

Discussion

The molecules in water are so close together that pressure can be transmitted from one molecule to another. When pressure is applied to the liquid column, the force is transmitted in all directions without any loss.

When the rubber sheet was pushed down, the pressure was transmitted to the water. This pressure forced additional water into the diver unit, thereby changing its buoyancy and causing it to sink.