

Cartesian Divers



Purpose: Demonstrates buoyancy and the compressibility of air (over water).

This is the traditional Cartesian diver demo, dressed up like a squid for fun. Squeeze the pop bottle and the pressure is transmitted throughout the (incompressible) water, compressing the air pocket inside the squid. Its density increases, and it sinks. You can make it rise, sink, or hover with neutral buoyancy.

Once the students see the squid, you can then show them a more conventional diver made from a test tube. With the test tube, they can see the air pocket shrink as outside pressure is applied to the pop bottle.

Note: After a certain amount of time the water must dissolve enough of the air inside the divers to sink them. If so, you will have to empty the bottle and set it up anew. They should just barely float.

Make sure the bottle is completely filled before capping it. Here is the easiest way I have found to set up:

- 1) Take a plastic yogurt dish (or any other wide mouth container) and fill to the brim with water.
- 2) Partially fill the diver with some water, and plug the base with your finger.
- 3) Then invert it and float it in the dish. Keep adjusting the diver until it floats with only a small portion above water.
- 4) Next, fill the pop bottle to the top and, again plugging the diver with your thumb, bung it into the bottle.
- 5) Top up the bottle, cap it, and you are ready to go!

Extra Equipment: None

Location: Shelf D1