

Experiencing the functioning of an Argo float with a Cartesian diver

Carol Brieseman-Hampton Hill School (New Zealand)

Materials

- A bottle of water
- A straw
- A paper clip
- A bowl of water
- Some plasticine or Blu Tac scrounge

STEP 1: Preparation

1. Bend the straw over and trim off the excess.
2. Squish the paper clip to be able to fit both sides of the straw.
3. Put the Blu Tac around the straw so it holds it together.

STEP 2: Trial

1. Take the bowl of water as a first trial.
2. To do this, place the straw on the water and see if it floats.
3. It is not supposed to sink or to stand too high, it is supposed to sit just a little bit above the water line level.

STEP 3: Real test

1. Place the straw into the bottle of water so that it floats up and down.
2. Seal the bottle very tight.
3. Place your hands halfway down the bottle and squeeze it.

You can see that when you squeeze the bottle the Cartesian diver goes down, and when you release the pressure it goes up.

Inside the straw there is air, so when we squeeze the bottle we put pressure on the air inside the straw, which makes it a bit denser, and that's why it goes down. And once the pressure is released, the air becomes less dense and the Cartesian diver ascends.

The principle behind the Cartesian divers is used for Argo floats. These robots are designed with advanced technology and are deployed in our oceans to measure the salinity and temperature of the water.

DISCUSSION

If the straw had sunk, what would have been the reason?

Possible answer:

Perhaps there was too much air or a little water in the straw, or perhaps you should have released the pressure by unscrewing the cap from the bottle and then putting it back on.