

Ocean Exploration Lab Report —Cartesian Diver

Instructions: Complete the lab report below while you explore the effects of pressure on a Cartesian diver in the Ocean Exploration Lab – Cartesian Diver experiment. You will submit your completed lab report.

(30 points possible)

Name and Title *(1 point)*

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Objective *(2 points)*

In your own words, what was the purpose of this lab?

The purpose of this lab was to demonstrate how pressure in the ocean affects sea divers and their depth in the ocean.

Hypothesis and variables *(3 points)*

Write your hypothesis in the If/then format shown in the Procedures and identify the independent and dependent variables.

Hypothesis: If the pressure increases, then the sea diver will sink.

Independent variable: The amount of pressure applied to the bottle.

Dependent variable: The depth of the diver inside the bottle.

Procedures *(6 points)*

Explain your steps, including which type of Cartesian diver you made. If you took pictures, you may add them here (optional).

I used the alternative method, so I didn't make one myself. But I'll still explain, in general, how the one in the example was made. Fill the bottle halfway, make your diver, fill the bottle to the top, then place the diver in carefully. Once that is done, put the cap on the bottle.

Data (6 points)

This is a sample data table. You may add to it or make your own.

Pressure	Observation of Diver	Depth (cm)
Neutral (starting position)	The diver is facing straight forward and is at the top of the bottle	3 cm
Small increase (lightly squeezing bottle)	The diver has turned slightly to the right (it's left), and has gone down 8 cm	11 cm
Large increase (strongly squeezing bottle)	The diver has turned completely to the side and has moved down another 10 cm (now at a depth of 21 cm)	21 cm

Conclusion (12 points)

Please write in complete sentences.

1. Was your hypothesis supported by your observations? Explain why.

Yes, it was. This is because as more pressure was applied to the bottle, the diver went deeper. With small pressure, the diver went from 3 cm to 11 cm. With strong pressure, the diver went from 3 cm to 21 cm. As you can see, the more pressure applied results in the deeper the depth the diver goes.

2. Identify any experimental errors.

Since I used the alternative method, I was not faced with any experimental errors.

3. You observed the effect of pressure on the buoyancy of the Cartesian diver. What is a different variable that you could change the next time you repeat this experiment and that might also affect the buoyancy of the diver?

Something that could be tried is to have a larger volume of water, which would require a larger-sized bottle. This will affect how much pressure is needed to sink the diver. The larger the volume, the more pressure needed. The smaller the volume, the less pressure needed.

4. How does this experiment relate to what you've learned about submersible technology such as submarines and ROVs?

In real life, divers must use weighted devices that add pressure (like the pressure applied from this experiment) to stay underwater, because of buoyancy. This experiment shows how the more pressure that is applied results in the diver going deeper into the water.