Name _____ Class_____Date_____

Skills Practice Lab **DATASHEET FOR LABBOOK**

Density Diver

Crew members of a submarine can control the submarine's density underwater by allowing water to flow into and out of special tanks. These changes in density affect the submarine's position in the water. In this lab, you'll control a "density diver" to learn for yourself how the density of an object affects its position in a fluid.

MATERIALS

- bottle, plastic, with screw-on cap, 2 L
- dropper, medicine
- water

SAFETY INFORMATION 

Using Scientific Methods

ASK A QUESTION

1. How does the density of an object determine whether the object floats, sinks, or maintains its position in a fluid?

FORM A HYPOTHESIS

2. Write a possible answer to the question above.

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TEST THE HYPOTHESIS

3. Completely fill the 2 L plastic bottle with water.
4. Fill the diver (medicine dropper) approximately halfway with water, and place it in the bottle. The diver should float with only part of the rubber bulb above the surface of the water. If the diver floats too high, carefully remove it from the bottle, and add a small amount of water to the diver. Place the diver back in the bottle. If you add too much water and the diver sinks, empty out the bottle and diver, and go back to step 3.
5. Put the cap on the bottle tightly so that no water leaks out.
6. Apply various pressures to the bottle. Carefully watch the water level inside the diver as you squeeze and release the bottle. Record what happens.

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7. Try to make the diver rise, sink, or stop at any level. Record your technique and your results.

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ANALYZE THE RESULTS

1. How do the changes inside the diver affect its position in the surrounding fluid?

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2. What relationship did you observe between the diver's density and the diver's position in the fluid?

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DRAW CONCLUSIONS

3. Explain how your density diver is like a submarine.

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4. Explain how pressure on the bottle is related to the diver's density. Be sure to include Pascal's principle in your explanation.

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Skills Practice Lab

DATASHEET FOR LABBOOK

Density Diver

Teacher Notes

TIME REQUIRED

One 45-minute class period

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LAB RATINGS

Teacher Prep–1
Student Set-Up–2
Concept Level–2
Clean Up–1

LAB NOTES

If there is any air in the bottle, students will have to squeeze harder to make the diver move.