

LAB 33: BUOYANCY 1

QUESTION

A boat with a large rock in it is floating in a lake. If the rock is thrown into the water, will the level of the lake go up, go down, or stay the same?

SAFETY

Standard safety precautions apply.

MATERIALS

Small plastic salsa cup, transparent drinking glass, rock, nonpermanent marking pen

PROCEDURE

To understand the question in this lab, one must know about buoyancy and density. There are two important principles of buoyancy:

1. When an object is floating, it displaces a volume of water equal to its own mass.
2. When an object is underwater, it displaces a volume of water equal to its own volume.

Hypothesis: The water level will _____ because _____

For this activity, you will determine your own procedure for answering the question, determine what data should be collected, and draw your own conclusion. Write a paragraph describing your procedure, draw at least one diagram showing your setup, and create a data chart to record your data.

Post-Lab Questions

1. Use what you know about density to explain your answer to this question: Which number is larger, the volume of a rock in cm^3 or the mass of the same rock in grams?
2. Based on your answer to #1, in which position should the rock displace more water, floating or underwater?
3. Write a paragraph that completely explains why the results of this experiment come out the way that they do.

Extension

If a 2 m^3 rock with a density of $3,000 \text{ kg/m}^3$ is dropped into a lake from a boat, how much will the volume of the lake change if the density of the water is $1,000 \text{ kg/m}^3$?