Instructions for Students

Introduction

In the density experiments you just completed, when you put an object such as a lump of clay into a full beaker of water, water spilled over the top. That was because in order for the clay to enter the water, it had to push some of the water out of the way, or *displace* it. The only place the displaced water could go was up and over the top of the beaker. The amount of displaced water equaled the volume of the lump of clay.

In the **Clay Boats** exercise, you took a lump of clay and shaped it so that it floated on top of the water. Now you will take a look at the relationship between floating objects and displaced water.

Procedure

1. Find and record the mass of your lump of clay.

2. Find and record the volume of your lump of clay.

3. Fill a 500 mL beaker about three-quarters full of water. On the outside of the beaker, make a mark to show the water level.

4. Without splashing any water, lower your lump of clay into the beaker. Make a new mark to show the new water level.

5. Without overflowing the water in the beaker, remove the clay and pat it dry with a paper towel. Shape the clay into a boat shape that you think will float inside the beaker. **Before** putting the clay in the water, predict where the new water level will be by drawing a short, dashed line on the beaker.

6. Carefully place the clay boat on the water surface. Mark the new water level. What happened? How close was your predicted water level to the actual water level?

7. Find and record the volume of the water displaced by the clay boat.

8. Find and record the mass of the water displaced by the clay boat.

9. Compare the volumes and masses of the displaced water to the volumes and masses you determined in steps 1 and 2.

10. Squash your clay boat back into a lump, and remove about one-quarter of the clay. Set it aside. Using the remaining clay (the larger portion), repeat steps 1 - 9, above.

When you repeated the steps with a smaller lump of clay, did you get similar results?