

Activity 13

Density

Objective

Students will observe and explain an experiment involving density.

Preparation

For each student: a copy of page A33

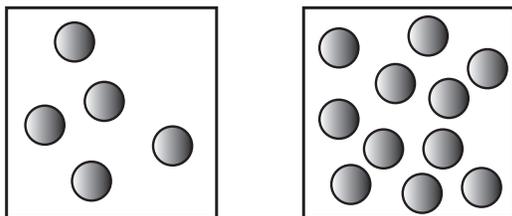
For the entire class: two clear glass beakers labeled A and B, two ice cubes, 200 ml of water and 200 ml of isopropyl alcohol

Lesson Plan

Begin by explaining the concept of density to the students. Every object or volume has a certain number of very small units called molecules.

Density is a measure of the amount of molecules in a given object or volume.

Draw two figures like the following on the board and ask the students if they can tell which box has a higher density.



An object with a lot of molecules has a high density. An object with fewer molecules has a lower density.

Fluids like water also have densities. Ask the students what would happen if you dropped an ice cube into a glass of water. Would it float or sink?

Ask them if density might play a role in this and, if so, how? (Ice has a lower density

than water; Objects with lower densities than water float to the top.)

The students are used to seeing ice cubes float in water. Ask them what will happen if you put an ice cube into another liquid that has a different density than water. Follow the steps below to find out:

Step 1 Fill Beaker A with 200 ml of water and fill Beaker B with 200 ml of alcohol.

Step 2 Walk around the room and have the students write their observations about the two beakers on the lines provided on A33. (Do not let the students smell the liquids - the odor will give away the presence of alcohol!) Write a few of their observations on the board.

Step 3 Show them the two ice cubes and explain that they are exactly alike. Ask them what they think will happen when you drop them in each of the beakers. Have them write their personal predictions on A33. When they are done, write a few of their predictions on the board.

Step 4 Drop the ice cubes in the beakers. They will observe that one of the ice cubes floats to the top, while the other ice cube sinks to the bottom. Because the students know that the ice cubes are the same, they should realize that the liquids are different.

Based on your previous discussion about the densities of ice and water, ask them which beaker contains the water. Then ask them to explain the relationship between the densities of the ice cube and the liquid contained in the second beaker.

Float or Sink?

A. In the space provided below, describe any observations you have about Beakers A and B.

Beaker A

Beaker B

B. What do you think will happen in Beakers A and B when the ice cubes are dropped in?

Beaker A

Beaker B

C. Describe in your own words what you have discovered about the densities of water, ice and alcohol. How do the densities of the three substances compare?
