The Weight Of Water

Objectives

Students will discover that seawater is more dense than fresh water.

Materials

For each student group:

- ❑ wide-mouth pint jar
- ❑ fresh egg
- ❑ large serving spoon
- ❑ water

For teacher:

- ❑ one wide-mouth pint jar filled with water
- ❑ gallon milk jug full of water
- ❑ empty gallon milk jug
- ❑ measuring cup
- ❑ pencil
- ❑ crayon
- ❑ plastic paper clip
- ❑ eraser
- ❑ salt

Action

1. Lead the students in a discussion about why a manatee needs to float (breathe air) and why it needs to sink (find food). Explain that manatees float very well due to their body fat and large lungs. The manatees' heavy bones help them sink. Ask students if they can float.
2. Ask the students if they think water has weight. Using a gallon milk jug filled with water and an empty gallon jug,, bring each student up to see which jug is heavier. This demonstrates that water has weight.

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3. Have the students speculate what types of objects will float in water. Let the students vote on whether the pencil, crayon, paper clip, or eraser will float or sink. Tally their votes on the blackboard next to the name of that object. Then test each object in the pint jar to find out what floats and what doesn't float. Were the students correct?
4. Divide the class into four or five groups (each group consists of at least three students). Have the students fill their pint jars three-fourths full of water.
5. Pass out the eggs, warning students that they'll break if not handled correctly. Have them vote on whether the egg will sink or float. Have them place the egg gently in the water. Does it float? (it shouldn't-be sure to use a fresh egg) Lead the students to the conclusion that the objects that were lighter than water floated and objects heavier than water didn't float. Take the eggs out of the water.
6. Add 1/ 2 ounce of salt to their pint jar of water. Let the students mix the water with the spoons. This mixture will simulate seawater (each gallon of seawater contains approximately 1/4 pound of salt).
7. Let students put the egg in the salt water. What happens? The egg should float. Why does this happen? (by adding salt, the water becomes heavier and more dense than fresh water and the egg; that's why it's easier for us to float in the ocean than in a pool or lake.) As a group, discuss why some objects float and others don't.

Deeper Depths

Take out the egg and add four ounces of salt to the pint jar to simulate the Dead Sea (the Dead Sea contains an amount of salt nine times greater than regular seawater.) Let the students taste how salty this water is. Add the egg to the salt water. Is there a difference in buoyancy between the water containing 1/2 ounce of salt and the water containing 4.5 ounces of salt? (The egg should float higher in the water that contains more salt.) Let the students experiment with the objects that sank during your demonstration (eraser, crayon, etc.)