Demo: Will it Float?

FOR THE TEACHER

Summary
In this demonstration, students will observe the relationship between the density of a solution and its impact on an object’s ability to float or sink. Uncooked eggs will be placed in a tap water sample and in a salt water solution so that students can make observations and compare the results in order to make a determination regarding the density value for each item.

Grade Level
Elementary School

NGSS Standards
- 2-PS1-1: Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties.

Objectives
By the end of this demonstration, students should be able to:
- Explain the meaning of density.
- Interpret an observation.
- Understand that different solutions can have different density values.
- Indicate that salt water is denser than tap water.

Chemistry Topics
This demonstration supports students’ understanding of:
- Density
- Mass
- Volume
- Solutions
- Observations

Time
Teacher Preparation: 5 minutes
Lesson: 25 minutes

Materials
- 2 uncooked eggs
- Tap water
- ½ cup measuring cup
- ½ cup of table salt
- 2 large transparent containers or cups (deep glass bowls will also work; be sure it can hold 2-3 cups)
- Marker
- Masking/labeling tape
- Mixing spoon
Safety

- Students should wear proper safety gear during chemistry demonstrations. Safety goggles and lab apron are required.
- Do not consume lab solutions, even if they’re otherwise edible products.
- Food in the lab should be considered a chemical not for consumption.

Teacher Notes

- Before class begins, set up a table with all of the materials in the front of the classroom. Make sure that every student will be able to observe the demonstration from where they are sitting.
- Explain the meaning of density to your students and relate it to real life by connecting floating in the water when you go swimming. Instruct the students to take out a piece of paper and record their observations.

Demonstration Procedures:

1. Fill both transparent containers with tap water (approximately 3 cups in each).
2. Add ½ cup of salt to one container and stir to dissolve and create a salt water solution.
3. Place one uncooked egg into the container containing only tap water.
4. Observe what happens.
5. Place the other uncooked egg into the container containing salt water.
6. Observe what happens.
7. Compare the behavior of the eggs in each of the containers.

- Results: The egg in the salt water will float and the egg in the tap water will sink. This indicated that the egg is less dense than the tap water, but the salt water is denser than the egg.
- The AACT Density animation may be a good follow-up to this demonstration.
- Differentiation: You could create different concentrations of salt water solution (use less or more salt). Also, your could compare and contrast the observations of the uncooked eggs in salt vs. tap water to boiled eggs in salt vs. tap water and discuss the differences. Make sure to label uncooked eggs and boiled eggs.
- Books that could tie-in to the lesson: “What is Density?” by Joanne Barkan
- Post-demo real world connection: This could be related to the oil spill. Like ships, oil floats because it is less dense than water, but unlike ships, oil requires no special engineering design in order to float. Oil is naturally less dense than water, which is why even oil and vinegar salad dressing separates, with the oil floating on the water-based vinegar. Though oil spills are detrimental to the environment, the ability of oil to float aids cleanup.