

The Salinity-Demonstration

From RODNEY'S HOMEPAGE for Earth Science Teachers

<http://formontana.net/home.html>

NOTE: To view other Earth Science-Related videos, go to www.TeacherTube.com and type "Rod Benson" into the search box.

Introduction: I do these demonstrations at the beginning of our study of ocean currents. Before students can understand ocean currents, they need to realize how salt affects the density of water. After the demonstration, I have my students do the "Ocean Currents Lab", which is included in the "Exploring Convection" Kit that I purchase from WARD'S . . . <http://formontana.net/colorful.html>

To learn more about the relevance of these concepts, check out the cover story of the September 2002 issue of Discover. The article explains the hypothesis that a change in the salinity of water near Greenland may affect the oceanic conveyor belt, which brings heat to the North Atlantic. Another example of the salinity-density concept is explained on this web site:

<http://formontana.net/uboats.html>

Purpose: to show how salinity affects the density of water. (A golf ball sinks in fresh water, but floats in very salty water.)

Materials

1. Two 1-liter beakers
2. 700 ml of room temperature water in each beaker
3. Two golf balls
4. 150 g. of pickling salt (salt without the iodine added)
5. A spoon

Directions:

1. Dissolve the 150 g. of **non-iodized salt** (iodine makes the water cloudy) in one of the beakers of water. This is about 135 ml of dry salt.
2. (I do this demonstration early in the school year while the students still trust me.) Challenge a student to see if he/she can float a golf ball. Tell them it takes a real "soft touch" and that few people "have what it takes". Brag a little, then carefully set your golf ball near the surface of the very salty water. Have the student-volunteer try it in the fresh water (not possible). Eventually they will ask to try the water that you used. Now that you've got their attention, explain the relationship between salinity and density.
3. Next remove the golf balls and add several drops of food coloring to the beaker of fresh water. Using a spoon to cushion the fall, pour some of the colored freshwater into the beaker containing the salty water. Since it is less dense, the freshwater should float on the salty water.
4. Gently place a golf ball into the beaker near the boundary between the two layers. It should float near that boundary for several days if left undisturbed.

NOTE: WARD's Natural Science sells a lab kit that will help your students understand the influence of density on ocean currents. The kit includes two labs, one related to ocean currents and the other related to the development of winds. It is called "Exploring Convection". To view videos of these convection activities on TeacherTube.com, search for "convection".