

Details



Completion Time: About one period

Permission: Download, Share, and Remix

Do You See What Icy?

Overview

This lesson answers the question: How does ice floating on the ocean act as it melts?

Objectives

Students will learn about temperature, salinity and their effect on density. Students will learn that ocean currents are caused by differences in densities as a result of temperature and salinity. These differences allow ocean currents to circulate water throughout the world's oceans.

Lesson Preparation

Prepare frozen cubes and cups as described in the Materials section.

Procedure

1. Draw two glasses on a piece of paper.
2. Label one "fresh water" and the other "salt water."
3. Draw a prediction of what will happen in each glass when the blue ice cubes are placed in the cups
4. Then, at the same time, partners gently place the blue ice cubes in each of the cups
5. Be sure not to touch the glasses or the water after the ice cube has been added to the water.
6. Begin observing. Watch carefully for at least 10 minutes, or until the ice has completely melted, whichever comes first.
7. While making observations, draw two more glasses.
8. Record your observations.
9. Measure the temperatures at the top and the bottom of both glasses.

Discussion:

1. The color in the ice cube allows us to observe more easily what is happening as the ice melts. How did the cold water in the tap water glass move? Why?
2. How did the cold blue water from the ice cube in the

Materials

Materials per pair of students:

- 2-2 oz. blue ice cubes (freeze 2 oz. of water mixed with 6 drops of blue food coloring)
- 2-16-ounce clear cups (Fill one with tap water and one with tap water saturated with salt)

salt water glass move? Why?

3. Does the blue water in the saltwater cup move down through the water column? If so, does it move at the same speed as the ice cube in the freshwater glass? If not, can you see anything moving when you observe very, very closely? If the blue water is not flowing down, what is it doing?

4. Does one ice cube melt faster than the other? Why?

Concepts:

1. Different densities as a result of temperature and salinity cause ocean currents which circulate water throughout the world's oceans.

2. In the freshwater glass, the only variable is temperature. Cold water is more dense than the warmer water, so the blue water sinks to the bottom. It gains heat energy as it moves through the warmer water column and as it moves along the bottom it begins to rise.

3. In the saltwater glass, the cold blue water melts and sits in a band on top of the warmer salt water, showing that even though it is much colder, it is less dense than the heavily saline water.

Extension

1. Try the same experiment using different densities of salt water and different temperatures of fresh water.

2. Place a blue ice cube in a large clear container of fresh water like a fish tank or plastic shoebox. Observe how the water moves through the "ocean."

Resources

N/A

Assessment

N/A

Credits

The creator of this lesson is unknown. If you know who created this lesson, please e-mail info@polartrec.com.



National Science Education Standards (NSES):

Content Standards, Grades K-4

Content Standard A: Science As Inquiry

- a. Abilities necessary to do scientific inquiry
- b. Understandings about scientific inquiry

Content Standard B: Physical Science

- a. Properties of objects and materials