Currently Warm

Purpose

Students will identify and explain that heat energy carried by ocean currents has a strong influence on climate around the world.

Materials

For the teacher: overhead transparency of Black Line Master (BLM) *Map of the World's Oceans*
For each student: copy of BLM *Map of the World's Oceans*, pencil
For each group of students: research materials on ocean currents such as an atlas, geology/meteorology books, etc.; laminated copy of BLM; red and blue overhead markers

Activity

A. Pre-Activity Discussion

1. Show students the transparency of the BLM *Map of the World's Oceans* and ask them to locate Indianapolis, Indiana, and Anchorage, Alaska, on the map.
2. Show students where Iqaluit, Canada, is on the map.
3. Tell students that the average temperature for January in Indianapolis is –3.8°C. Ask students if they think the average temperature for January in Anchorage is higher or lower than the average temperature in Indianapolis.
4. Tell students that the average temperature in January in Anchorage is –10°C.
5. Tell students that the average temperature in January in Iqaluit, Canada, which is not quite as far north as Anchorage, is –30°C.
6. Ask students if they can think of any reasons why Anchorage would be so much warmer than Iqaluit.
7. Explain that many things can affect climate and that the class will be investigating ocean currents to determine if they might affect the difference in expected temperatures.

B. Investigating Currents

1. Divide students into groups of two or three and distribute a copy of the BLM to each student. Provide research material, a laminated copy of the BLM, and markers to each group.

(continued)

MEETING INDIVIDUAL NEEDS

Have students who need a challenge research individual currents within the larger regions. For example, the Gulf Stream (United States) and the Kuroshio (Japan) both cause coastal areas in high latitudes to have warm climates. Ask students how this has impacted the human settlement of these areas.

EXTENDING THE ACTIVITY

Have students predict and then research whether the average temperature of a coastal region is higher or lower than an inland region of the same latitude. If some results are different than expected, have them investigate whether the altitudes at the two places differ.

Standards Links
7.7.1, 7.7.3

Activity (continued)

2. Assign each group an ocean region (North Atlantic, South Atlantic, North Pacific, South Pacific, Indian Ocean, Southern, or Arctic).
3. With the help of the research materials provided, direct students to draw and label the currents in their region on their laminated map, using red for warm currents and blue for cold currents.

C. Discussion

1. Have each group draw the currents in their region on the class transparency using the appropriate color marker.
2. Have students draw and neatly label all the currents on their maps.
3. Ask students: "Do you think that the currents might affect the climate of the regions by which they pass?"
4. Explain that because oceans cover nearly three-fourths of Earth's surface, they absorb more solar energy than anything else.
5. Explain that ocean currents from the equator carry warm water to the north and south and that this warm water influences the climate as winds pass over it and carry warm air to land (e.g., Anchorage is located near a warm current that raises the temperature).
6. Ask students: "Based on this information, how do the currents coming from the poles differ from the ones coming from the equator? How does this influence climate?"

Classroom Assessment

Basic Concepts and Processes

After students have finished their maps and discussed their findings, ask questions, such as the following:

 Would you predict that the weather on the coast of England is warmer or cooler than the inland areas?

 Why do you think that?

 How is the Antarctic climate affected by the ocean currents?

 How do you know?

Name: _____

Map of the World's Oceans