

Ocean Currents Around the World

OBJECTIVES

The students will be able to illustrate and describe the circulation of major ocean currents.

National Geography Standard: 1

MATERIALS

- Ocean atlas or atlas that contains ocean current charts
- Copies of world map on page 10 (one per student group)
- Writing and drawing materials including color markers or pens

BACKGROUND

Unequal heating and cooling of the Earth's surface from solar radiation causes air masses to rise, cool, and fall. The moving air masses create wind that drives oceanic surface waters. Earth's rotation and the direction of trade winds create currents that follow a usually predictable pattern. Generally, ocean currents flow in a clockwise direction in the Northern Hemisphere and in a counterclockwise direction in the Southern Hemisphere.

ACTION

1. Divide students into five or six groups and assign each an ocean:
 - North Pacific
 - South Pacific
 - North Atlantic
 - South Atlantic
 - Indian Ocean
 - Arctic Ocean (for advanced students)
2. Using the blank world map provided (page 10), have students show the movement of water in each group's water basin. Students should use different colors to illustrate currents, indicating direction with arrows. *Note: the South Atlantic and Pacific Oceans become one uninterrupted water mass around Antarctica.*
3. Have the groups present their water basin maps to the class, explaining circulation movements.
4. Put all the maps together on a bulletin board. What are some similarities among the various ocean basin currents? What are some differences?

Activity Extensions:

1. What happens when ocean currents reverse or extend their ranges? Have students research the past effects of El Niño, a cyclic event characterized by a number of atmospheric changes, including an unusually warm water current that prevents the upwelling of nutrient-rich cold water.
2. Have students pick any coastal city. Using only the ocean currents, they should chart a course to reach the other side of the ocean. What time of year will they travel? How long will the journey take?

Saving My Wild

Did you know that in Antarctica, the bodies of some animals contain pesticides that have never been used in the Antarctic? How in the world did the pesticides get there? The answer is that ocean currents and tides, along with the atmosphere and marine animals, can carry pollution great distances. Ask students to investigate the kinds of pollutants that ocean currents carry and how the pollutants affect different ecosystems.

National Geographic News, "Couscous Finds 'Horrifying' trash on Desert Islands"
news.nationalgeographic.com/news/2003/07/0728_030728_trashhawaii.html

Nova Online—tracking El Niño
www.pbs.org/nova/nova/elnino/#

Ocean currents map from the Office of Naval Research
www.onr.navy.mil/focus/ocean/motion/currents1.htm

Ocean Planet—Smithsonian
seawifs.gsfc.nasa.gov/OCEAN_PLANET/HTML/oceanography_currents_1.html

Windows to the Universe: Currents of the Ocean
www.windows.ucar.edu/tour/link=/earth/Water/ocean_currents.html#edu-mid

World Map

