

Ocean Current Simulator

OBJECTIVE: To investigate how temperature differences help control the flow of the ocean

Get It Together

- clear 2-liter soda bottle (one for each group of students)
- ruler
- sharp scissors
- a world map or globe
- "Hot Stuff/Cold Stuff" lab sheet (page 38)

Science in the Bag

While ponds, lakes, and oceans may seem like homogeneous bodies of water, small currents often flow through them. These currents are often caused by the uneven heating and cooling of water. Water, like most forms of matter, becomes less dense when it gets warm. As a result, warm water tends to flow up toward the surface while cold water tends to sink. Scientists call this type of flow *convection*, and it affects all fluids, including air and molten rock (magma). Convection not only causes the motion in the ocean, but also makes the wind blow and the continental plates shift positions on Earth.

Before You Start

Remove the labels from the soda bottles. For each bottle, measure and mark about 20 centimeters (8 in.) from the bottom. Cut off the top of the bottle from the mark, leaving behind a plastic cylinder. Make sure you have access to hot tap water (around 100°–110° F.)

What to Do

- ① Ask students if they've ever gone swimming in the ocean or a lake when they suddenly hit a patch of warmer or colder water. Explain that these hot and cold spots are often caused by water currents. Ask students: What is a current? (*A flow of something, like electricity or water*)
- ② Hold up a globe or a world map, pointing to the Atlantic Ocean. Explain that currents are like rivers that flow through the ocean waters. In the Atlantic Ocean, one famous current is called the Gulf Stream. It flows up from the equator along the East Coast of the United States and across the north Atlantic toward England.
- ③ Explain that many currents are caused by a process called *convection*. Convection is the flow of heat from one place to another within a fluid. Tell students that they will be conducting an experiment to observe what causes ocean currents. Distribute copies of the "Hot Stuff / Cold Stuff" lab sheet to students.