# Activity #6 - Deep Ocean Currents

## Concepts #1 & 4

**#1** The sun warms the Earth's surface, which controls global currents and climate, keeping the earth habitable.

**#4** The ocean is one continuous body of water with global currents that interact, with water surrounding all landforms.

## Objective:

Students observe the interactions of different temperatures of water using colored ice and a thermometer and then compare the results with global ocean current solar heating.

### Materials:

- world maps
- activity sheets
- clear glass
- water – cold tap
- water – hot tap with 2 drops of red food coloring
- ice cubes frozen with 15 drops of green food coloring
- aquarium thermometer
- spoons

## Procedures:

1. Each group of 3-4 students obtains 1 clear glass filled ¾ full of cool tap water.
2. Students place an aquarium thermometer in the glass. Wait 2 minutes, then record the temperature.
3. Students obtain an ice cube and place in the water, using a spoon.
4. Students observe the glass, draw the glass, and explain what is happening.
5. Wait 2 minutes and record the temperature.
6. Students obtain ¼ glass of hot colored tap water and gently pour the water down the inside edge of the glass. Don't disturb the rest of the water.
7. Students observe the glass, draw the glass, and explain what is happening.
8. Wait 2 minutes and record the temperature.

## Evaluation:

- Was the colored water moving away from the ice cube colder or warmer than the water in the glass? (cooler)
- Was the warm colored water that was added colder or warmer than the water in the glass? (warmer)
- Where would floating ice be found in the ocean? (near the poles)
- Where would cold water be found? ( poles and in the deep ocean)
- Where would cold water flow in the ocean? (at the bottom) Why?
- Where would you expect to find the warmest waters in the ocean? (near the equator and at the surface)
- Where would warm moving water flow in the ocean? (near the surface) Explain.
- Which direction would cold water move in the ocean? (down and toward the equator where it is heated)
- Which direction would warm water move in the ocean? (up and toward the poles, where it cools.)
- Scientists have found that water in the ocean is well mixed. How do differences in temperatures mix ocean waters?

# Worksheet:  Deep Ocean Currents

Temperature of cool tap water _____.

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What happens after adding the ice cube?  Describe in words and draw a picture of the glass.

Temperature of water with the ice cube in it _____.

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What happens after adding the warm water?  Describe in words and draw a picture of the glass.

Temperature of water with warm water added _____.