

## Activity: Ocean Currents



Ocean water moves on and below the surface in “streams” known as **currents**. All ocean currents are caused by either **wind patterns** or by differences in **water densities**.

Ocean waters move in a continuous cycle. The deep waters of the oceans come from the surface water cooled in the polar region. Near the poles, the surface water is cooled and becomes heavier. This cool, heavy water sinks and flows towards the equator. Along the way it mixes with warmer, fresh water and gradually rise. Eventually the surface waters are moved by the winds toward the polar regions to complete the cycle. Oceanographers believe that the complete cycle from pole to equator and back again takes hundreds of years.

There are two major types of currents that move the waters of the world’s oceans. There are:

- **Surface currents** are driven by wind and follow global atmospheric patterns. Cold surface currents move from the polar regions to the equatorial zones, and warm surface current move in the opposite way.
- **Deep currents** are caused by the differences in water densities. Because all the oceans are connected, all ocean currents interact to form a continuous worldwide pattern of water circulation.

The currents flow in certain patterns throughout the world. The currents in the northern hemisphere flow clockwise up from the equator toward the polar regions and then back. While the currents in the southern hemisphere flow in a counter clockwise direction south from the Equator to the polar regions.

- **Gulf Stream** – a mighty river of ocean water flows northward from the tropics and then eastward. This current brings warmth to the climate of England and Scandinavia. The Gulf Stream flows southward off the coast of Spain and Africa and becomes the **Canary Island Current**.
- **Canary Island Current** – flows eastward across the equatorial region towards North America.
- **East Greenland Current** – flows south from Greenland brings cold polar waters with it.
- **North Atlantic Current** – flows north of Europe and Russia back to the polar region near Greenland.
- **Kuroshio Current** – is the Pacific Ocean’s equivalent of the Gulf Stream – it flows north from the Equator to Japan and then travels across the northern Pacific Region to become the California Current.
- **Antarctic Circumpolar Current** – is a large current the flows around the world in the Antarctic polar Regions. This cold water current breaks off into several other currents.
- **Peru Current** - originates from the Antarctic Circumpolar current and flows northward up the west coast of South America.
- **Australian Current** - flows out of the warm water coming from the Equator that traveled northward as the Peru Current.
- **Benguela Current** – flows north from the Antarctic Circumpolar Current and turns westward from at the equator. It travels south as the Brazil Current.
- **Brazil Current** – a warm current traveling southward from the Equator along the cost of Brazil.

**Purpose:** to locate and label the major ocean currents.

**Materials:**

map

instruction sheet

map colors

worksheet

## Procedure:

1. Read and review the descriptions of the currents.
2. Color the **warm** currents using a **red** arrow the map colors.
3. Color in the **cold** surface currents with a **blue** arrow.
4. Properly mark the legend to explain the types of ocean currents.
5. Label the following major **surface currents**:

Gulf Stream	Kuroshio
East Greenland	Peru
North Atlantic	California
Benguela	East Australia
Brazil	Antarctic Circumpolar
Canary Islands	

**Conclusions:** answer in the space provided.

1. Describe the “clock” direction of surface currents in the Northern Hemisphere.
2. Describe the “clock” direction of surface currents in the Southern Hemisphere.
3. What is the most common source of energy for surface currents?
4. What is the relationship between the movement of the atmosphere and the movement of surface currents?
5. What is the main force that drives deep ocean currents?
6. What factors determine the density of the ocean water?
7. What impact would the Gulf Stream current have on the climate in England, and why?
8. What is a long distance surface current?
9. Where are short distance surface currents located ?
10. Compare the movement of surface and deep currents.
11. What is the most common source of energy for surface waves ?
12. What process brings the deep cold ocean currents up?



Name: \_\_\_\_\_ Period: \_\_\_\_\_ Date: \_\_\_\_\_

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