



Global Wind Patterns Activity

The region of Earth receiving the Sun's direct rays is the equator. Here, air is heated and rises, leaving low pressure areas behind. Moving to about thirty degrees north and south of the equator, the warm air from the equator begins to cool and sink. Between thirty degrees latitude and the equator, most of the cooling sinking air moves back to the equator. The rest of the air flows toward the poles. The air movements toward the equator are called trade winds- warm, steady breezes that blow almost continuously. The Coriolis Effect makes the trade winds appear to be curving to the west, whether they are traveling to the equator from the south or north.

The trade winds coming from the south and the north meet near the equator. These converging trade winds produce general upward winds as they are heated, so there are no steady surface winds. This area of calm is called the doldrums.

Between thirty and sixty degrees latitude, the winds that move toward the poles appear to curve to the east. Because winds are named from the direction in which they originate, these winds are called prevailing westerlies. Prevailing westerlies in the Northern Hemisphere are responsible for many of the weather movements across the United States and Canada.

At about sixty degrees latitude in both hemispheres, the prevailing westerlies join with polar easterlies to reduce upward motion. The polar easterlies form when the atmosphere over the poles cools. This cool air then sinks and spreads over the surface. As the air flows away from the poles, it is turned to the west by the Coriolis effect. Again, because these winds begin in the east, they are called easterlies. Many of these changes in wind direction are hard to visualize. Complete this exercise to see the pattern of the winds.

Materials Needed

- Illustration below
- pencil
- colored pencil or marker

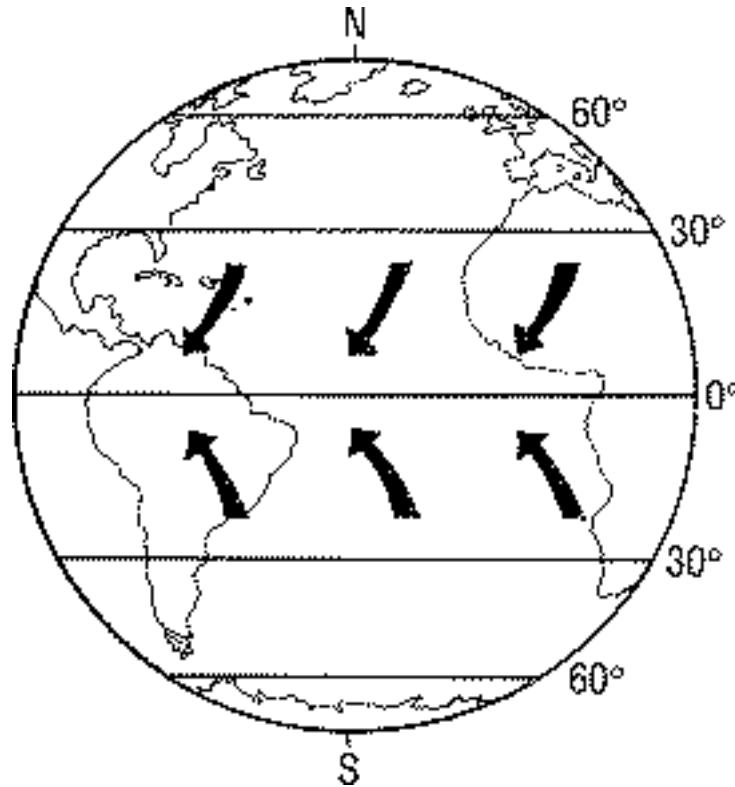


Illustration of the earth needed for the experiment.

Procedure

Carefully read the paragraphs above. Draw arrows to represent wind movement, be sure to show how winds change direction at certain latitudes, which are labeled for you. Arrows representing the trade winds have already been drawn. Use orange to color the trade winds, green for the prevailing westerlies, and blue for the polar easterlies. You may need to look back at the results of [Blow, Wind, Blow](#) to be able to show the Coriolis effect.

Questions

1. What winds would Columbus have used to travel from Spain to the Caribbean?
2. Which winds would he have needed to return to Europe?
3. Would winds have favored European explorers seeking to travel east around the tip of Africa?

Teachers Information

This is a quick Intro Activity, designed to take a few minutes at the beginning of the class to begin studies of the global wind patterns and how El Niño and the winds interact.

MA science and Technology Frameworks Grades 6-8

- Explain the relationship among the energy provided by the sun, the global patterns of atmospheric movement, and the temperature differences among water, land and atmosphere.

MA science and Technology Frameworks Grades 9 or 10

- Explain the dynamics of oceanic currents, including upwelling, density and deep water currents, and their relationship to global circulation within the marine environment and climate.

The answers to Global Wind Patterns questions.

1. Trade winds
2. Prevailing westerlies
3. No

Activity is from NASA Earth Science Enterprise for Kids