

Global Wind Patterns

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.

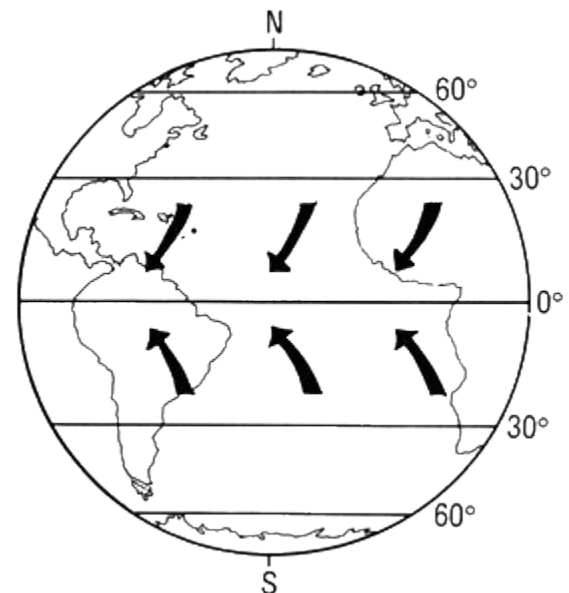
At about sixty degrees latitude in both hemispheres, the prevailing westerlies join with polar easterlies to reduce upward motion. The polar easterlies form when the atmosphere over the poles cools. This cool air then sinks and spreads over the surface. As the air flows away from the poles, it is turned 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.

Procedure

Carefully read the paragraphs above. Draw arrows on the diagram on the right 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.

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?



Wind and Air Pressure Crossword Puzzle

VERTICAL	AIRPRESSURE	PRESSURIZED	PRESSURE
DECREASES	INCREASES	JETSTREAMS	ANEMOMETER
BAROMETER	MERCURY	STANDARD	EAST
WINDVANE	WINDFARM	WEIGHT	NORTH
SPINS	SOUTH	WIND	LOW
WINDMILL	DISTANCE		

Down

1. A machine that is run by wind power. It can be used to pump water or generate electricity.
2. The measurement of air pressure at sea level is called ____ air pressure.
6. The movement of air from areas of high pressure to areas of low pressure.
7. Doppler radar devices can give a reading of the ____ winds from the ground to an altitude of

Across

2. A wind blowing from the south to the north is call a ____ wind.
3. To predict winds, meteorologists use both the size of the pressure difference and the ____ between the high- and low-pressure areas.
4. Air pressure increases or decreases as a result of shifts in the ____ of the atmosphere.
5. If the arrow on a wind vane points north, the wind is

ten miles.

9. A system of many wind turbines, which work together to generate electricity. (2 words)
11. Planes are ____ to about 75% of the normal sea level air pressure.
12. Air pressure ____ as altitude increases.
13. Narrow bands of high-speed winds in the upper atmosphere. These winds are extremely important to pilots. (2 words)
15. The instrument used to measure air pressure.
19. Because Earth ____, winds curve as they blow.

moving ____.

6. A device that shows wind direction with an arrow. (2 words)
8. Wind moves from areas of high pressure to areas of ____ pressure.
10. The difference in air ____ between two areas can cause winds.
14. The weight of air of the atmosphere pressing down on Earth. (2 words)
16. The unit of measurement for air pressure is usually inches of ____.
17. A wind blowing from the east to the west is called an ____ wind.
18. When air in the atmosphere is cooled, air pressure ____.
20. A device that can be used to measure wind speed.

Wind and Air Pressure

Complete the puzzle.

