

Directed Reading

Section: Atmospheric Circulation

1. In what pattern does air near Earth's surface generally flow?

2. What causes the movement of air worldwide?

3. Where do high-pressure regions form?

4. Where do low-pressure regions form?

THE CORIOLIS EFFECT

5. The circulation of the atmosphere and the oceans is affected by

- a. the rotation of Earth at the equator.
- b. the rotation of Earth on its axis.
- c. the rotation of the moon on its axis.
- d. seasonal storms.

6. Do points near the equator or points near the poles travel farther and faster in a day? Explain your answer.

Directed Reading *continued*

7. Why does air follow a curved path?

8. The curving of the path of a moving object from an otherwise straight path due to Earth's rotation is called the _____.

9. What determines the path along which the Coriolis effect deflects moving objects?

10. In which direction does the Coriolis effect deflect moving objects in the Northern Hemisphere? in the Southern Hemisphere?

11. How does the speed of an object relate to the Coriolis effect?

12. How do the mass and travel distances of air and ocean currents relate to the Coriolis effect?

13. In general, on which types of objects is the Coriolis effect detectable?

Directed Reading *continued*

GLOBAL WINDS

- _____ 14. What are the three looping patterns of air flow in each hemisphere called?
- a. wind belts
 - b. convection cells
 - c. prevailing winds
 - d. global air flow
- _____ 15. A wind belt is characterized by prevailing winds that
- a. flow in one main direction.
 - b. flow from the southwest.
 - c. flow from the northeast.
 - d. flow in all directions.
- _____ 16. The prevailing winds that blow from east to west from 30° latitude to the equator in both hemispheres are called the
- a. trade winds.
 - b. polar easterlies.
 - c. wind belts.
 - d. westerlies.
- _____ 17. In the Northern Hemisphere, trade winds flow from the
- a. southeast.
 - b. south.
 - c. northeast.
 - d. northwest.
- _____ 18. From what direction do trade winds flow in the Southern Hemisphere?
- a. the northeast
 - b. the southeast
 - c. the north
 - d. the southwest
- _____ 19. The prevailing winds that blow from west to east through the contiguous United States are the
- a. trade winds.
 - b. doldrums.
 - c. polar easterlies.
 - d. westerlies.

Directed Reading *continued*

- _____ 20. What are the prevailing winds that blow from east to west between 60° and 90° in both hemispheres?
- the westerlies
 - the polar easterlies
 - wind belts
 - the trade winds
- _____ 21. A stormy region created where the polar easterlies meet warm air from the westerlies is called a
- trade wind.
 - doldrum.
 - front.
 - wind belt.
- _____ 22. The sun's rays shift northward and southward during the changing seasons of the year causing a shift in the position of
- convection zones and horse latitudes.
 - fronts and trade winds.
 - pressure belts and wind belts.
 - convection zones and pressure belts.

In the space provided, write the letter of the description that best matches the term or phrase.

- | | |
|-----------------------------------|---|
| _____ 23. doldrums | a. narrow bands of winds formed when very warm equatorial air meets the cooler air of the middle latitudes |
| _____ 24. horse latitudes | b. narrow bands of strong winds that blow in the upper troposphere |
| _____ 25. jet streams | c. bands of winds formed as a result of density differences between cold polar air and the warmer air of the middle latitudes |
| _____ 26. subtropical jet streams | d. subtropical high-pressure zones with weak and variable winds |
| _____ 27. polar jet streams | e. a narrow zone at the equator where the trade wind systems meet |

Directed Reading *continued*

LOCAL WINDS

Use the terms from the list below to complete the sentences that follow. Each term may be used only once.

valley breeze

breezes

sea breeze

land breeze

mountain breeze

local winds

28. Air movement influenced by local conditions and local temperature variations often cause _____, which are not part of the global wind belts.
29. Winds that blow at speeds of less than 50 km/h are called _____.
30. As warm air above land rises and the cool air above water moves in to replace it, a cool wind moving from water to land, called a _____, forms in the afternoon.
31. Overnight, the land offshore cools more rapidly than the water does, and a sea breeze is replaced by a _____, which flows from the cool land toward the warmer water.
32. During the day in mountainous regions, a gentle breeze called a _____ forms when warm air from the valleys moves upslope.
33. At night in the mountains, cool air descends from the peaks to the valleys, creating a _____.

