Section 21.1 Factors That Affect Climate

This section explains how latitude, elevation, topography, water, winds, and vegetation affect climate.

Reading Strategy

Summarizing Information As you read, summarize the effect(s) each factor has on climate. For more information on this Reading Strategy, see the Reading and Study Skills in the Skills and Reference Handbook at the end of your textbook.

Factors That Affect Climate

1. Circle the letter of the answer that correctly completes the following sentence. As latitude increases, the intensity of solar energy
   a. decreases.  
   b. increases.  
   c. stays the same.  
   d. is unrelated.

2. Temperate zones have _______hot_______ summers and _______cold_______ winters because of the angle of the sun’s rays and the length of daylight in the summer and winter.

3. Why do the polar zones have cold temperatures year-round?

   The sun’s rays strike the surface of Earth at a very small angle, causing the energy to spread out over a larger area. The surface of Earth is heated much less when the angle is smaller.

4. Is the following sentence true or false? The polar zones are located between 66.5° north and south latitudes and the poles.
   true

   a. polar zone  
   b. temperate zone  
   c. tropics  
   d. equator
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6. What effect does elevation have on precipitation? The higher the elevation, the _______ less precipitation an area receives.

7. Describe why a rain shadow occurs. As warm, humid air moves up a mountain’s slopes, it cools, forming clouds. Heavy precipitation falls from these clouds. By the time the air reaches the leeward side of the mountain, most of the moisture is lost. The dry area is called a rain shadow.

8. ☐ Is the following sentence true or false? The higher the elevation is, the colder the climate. _______ true

9. Circle the letter of the angle at which the sun’s rays strike the surface of Earth in the tropics.
   a. almost a 45° angle
   ☐ b. almost a right angle
   c. less than a 45° angle
   d. more than a right angle

10. The figure below shows the rain shadow effect. Identify the labeled items on the lines provided.

   a. _______ windward side
   b. _______ leeward side
   c. _______ rain shadow
   d. _______ warm, dry air

Match each sentence with the term that completes it.

   d 11. In the temperate zones, the sun’s rays strike the Earth at a _______ angle than near the equator.
        a. global winds
        b. larger
        c. precipitation
        d. smaller

   b 12. When the sun’s rays strike Earth at an angle less than 90°, the energy is spread out over a _______ area.
        a. global winds
        b. larger
        c. precipitation
        d. smaller

   a 13. ☐ _______ distribute(s) heat and moisture around Earth.
        ☐ a. global winds
        ☐ b. larger
        ☐ c. precipitation
        ☐ d. smaller

   c 14. ☐ Plants influence _______ through transpiration, which releases water vapor from their leaves into the air.
        ☐ a. global winds
        ☐ b. larger
        ☐ c. precipitation
        ☐ d. smaller