

Physical Geography, Chapter 5

Learning Objectives and Study Questions

1. Briefly describe how **atmospheric pressure** originates and what general type of unit we use to measure it.
 2. Predict the direction a **wind** will flow across Earth's surface in response to a pressure gradient and the **Coriolis effect**.
 3. Predict which way **local winds** (mountain-valley breezes and land-sea breezes) will blow at different times of day, and why.
 4. Predict the direction of the wind at any point on Earth's surface according to the **planetary wind system model**.
 5. Describe the directions in which **surface currents** circulate in northern and southern hemisphere oceans and briefly explain why this circulation occurs.
1. Atmospheric pressure is a measure of _____ (the weight of the air above us) per unit of area.
 - A. mass
 - B. force
 - C. momentum
 - D. acceleration
 - E. inertia
 2. Because air is a fluid that flows to accommodate pressure differences, the pressure on a body is:
 - A. greatest on top surface
 - B. greatest on bottom surface
 - C. greatest on sides
 - D. least on sides
 - E. equal on all sides
 3. Standard pressure at sea level is 1013.2 millibars (or 14.7 lb/in²) and it _____ as you go upwards.
 - A. increases
 - B. remains constant
 - C. decreases
 - D. varies erratically
 - E. increases then decreases
 4. Wind is the flow of air from areas of _____ to areas of _____ .
 - A. high elevation, low elevation
 - B. high pressure, low pressure
 - C. low elevation, high elevation
 - D. low pressure, high pressure
 - E. high humidity, low

5. During the day, coastal areas experience _____ breezes.
- A. valley
 - B. mountain
 - C. land
 - D. sea
 - E. gusty
6. At night, upland areas experience _____ breezes.
- A. valley
 - B. mountain
 - C. land
 - D. sea
 - E. gusty
7. The *Coriolis effect* causes air currents to turn to the _____ of their intended paths in the northern hemisphere.
- A. right
 - B. left
 - C. east
 - D. west
 - E. south
8. The planetary wind system model predicts that winds will blow from the _____ between 0 and 30°S.
- A. south
 - B. southeast
 - C. southwest
 - D. north
 - E. northeast
9. In the northern hemisphere, winds spiral around cyclonic (low pressure) storms like hurricanes in a/an _____ direction.
- A. alternating
 - B. erratic
 - C. clockwise
 - D. counterclockwise
 - E. variable
10. Near the equator, global atmospheric circulation is dominated by a belt of _____ pressure and _____ precipitation.
- A. low, low
 - B. low, high
 - C. high, low
 - D. high, high
 - E. variable, erratic

11. Regions around 30°N and S are dominated by belts of _____ pressure and _____ precipitation.
- A. Low, low
 - B. Low, high
 - C. High, low
 - D. High, high
 - E. Variable, erratic
12. In the upper atmosphere, a balance between pressure gradient force and the Coriolis effect create *geostrophic winds* that flow _____ above the equator and _____ near the poles.
- A. northward, southward
 - B. southward, northward
 - C. eastward, westward
 - D. westward, eastward
 - E. quickly, slowly
13. The warmest, least saline waters in the ocean are found at:
- A. depth near the equator
 - B. depth near the poles
 - C. the surface near the poles
 - D. the surface near the equator
 - E. middle depths around the world
14. In southern hemisphere ocean basins, surface currents circulate:
- A. clockwise
 - B. counterclockwise
 - C. eastward
 - D. westward
 - E. erratically
15. During an El Niño event, upwelling ceases in the western Pacific and surface waters become _____ than usual.
- A. warmer
 - B. cooler
 - C. richer in nutrients
 - D. saltier
 - E. wetter