

Name: _____ Date: _____

Conquer the Blue Planet: Freshmen Ocean Systems Challenge

Students trace global energy transfers and phase changes that drive Earth's hydraulic engine and regulate maritime climates.

1. Which specific property of water allows the Mediterranean Sea to retain heat longer than the surrounding landmasses, regulating coastal temperatures?

- A. High surface tension
- B. High specific heat capacity
- C. Low molecular density
- D. High magnetic polarity

2. The process by which plants release water vapor into the atmosphere through their leaves is known as _____.

- A. Sublimation
- B. Infiltration
- C. Transpiration
- D. Deposition

3. Thermohaline circulation is primarily driven by differences in water density caused by variations in temperature and salinity.

- A. True
- B. False

4. In the open ocean, what is the primary source of the salts—such as sodium and chloride—that contribute to the sea's salinity?

- A. Atmospheric nitrogen fixation
- B. Chemical weathering of continental rocks
- C. Anthropogenic runoff from urban centers
- D. Melting of polar ice caps

5. The transition layer between warmer surface water and colder deep water, where temperature decreases rapidly with depth, is called the _____.

- A. Halocline
- B. Pycnocline
- C. Thermocline
- D. Benthic Zone

6. When sea ice forms in the Arctic, the salt is pushed out of the ice crystals, making the surrounding water less salty and less dense.

- A. True

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B. False

7. Which phenomenon occurs when surface winds push warm water away from a coastline, allowing cold, nutrient-rich water to rise from the depths?

- A. Downwelling
- B. Tidal Bore
- C. Upwelling
- D. The Coriolis Effect

8. In the water cycle, _____ occurs when water vapor loses thermal energy and changes state into liquid water droplets, forming clouds.

- A. Evaporation
- B. Condensation
- C. Advection
- D. Percolation

9. What happens to the density of seawater as its salinity increases?

- A. Density decreases
- B. Density remains constant
- C. Density increases
- D. Density fluctuates randomly

10. Surface currents in the Northern Hemisphere generally circulate in a clockwise direction due to the Coriolis Effect.

- A. True
- B. False