

# Advanced Oceanography Facts

Oceanography · Answer Key · 12 Questions

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**1. Which phenomenon is primarily responsible for the formation of abyssal plains, vast and exceptionally flat regions of the deep ocean floor?**

- A) Subduction zones along convergent plate boundaries
- B) Hydrothermal vent activity creating mineral deposits
- C) Accumulation of fine-grained sediment from pelagic fallout**
- D) Tectonic uplift and subsequent erosion by submarine landslides

**2. The 'Great Ocean Conveyor Belt' (thermohaline circulation) is driven by density differences. What specific property change most significantly initiates the sinking of surface waters in the North Atlantic, a crucial step in this circulation?**

- A) Increased salinity due to evaporation
- B) Decreased temperature**
- C) Increased atmospheric pressure
- D) Increased dissolved oxygen concentration

**3. What is the primary mechanism by which the majority of dissolved inorganic carbon is transported from the ocean's surface to the deep ocean, playing a vital role in the biological pump?**

- A) Advection by large-scale ocean currents
- B) Diffusion through the thermocline
- C) Incorporation into sinking particulate organic matter**
- D) Formation of carbonate shells and skeletons by calcifying organisms

**4. Mid-ocean ridges are characterized by extensive volcanism. What is the primary source of magma that feeds this volcanism?**

- A) Melting of subducting oceanic crust
- B) Decompression melting of the asthenosphere**
- C) Melting of continental crust overriding the ridge
- D) Partial melting of the lower mantle

**5. The oxygen minimum zones (OMZs) are areas of the ocean with very low dissolved oxygen concentrations. Which of the following factors is LEAST directly responsible for the existence and expansion of OMZs?**

- A) High rates of microbial respiration and organic matter decomposition
- B) Reduced ventilation of deeper waters by surface currents
- C) Increased primary productivity in overlying surface waters
- D) Upwelling of oxygen-depleted waters from the abyss**

**6. What is the fundamental reason for the stratification of ocean water into distinct layers (e.g., epipelagic, mesopelagic)?**

A) Differences in solar radiation penetration

**B) Variations in salinity and temperature**

C) Pressure gradients at different depths

D) Presence of distinct plankton communities

**7. The Challenger Deep, the deepest known point in the Earth's oceans, is located within which oceanic trench?**

A) Tonga Trench

B) Kermadec Trench

**C) Mariana Trench**

D) Philippine Trench

**8. Which type of seismic wave is most effective at generating tsunamis when they occur underwater?**

A) S-waves (Shear waves)

**B) P-waves (Primary waves)**

C) Surface waves (Love and Rayleigh waves)

D) Love waves

**9. What is the primary characteristic defining the photic zone of the ocean?**

**A) The depth at which light intensity is sufficient for photosynthesis**

B) The upper limit of the aphotic zone

C) The region where dissolved oxygen levels are highest

D) The area where sound waves can travel unimpeded

**10. The phenomenon of upwelling, where deep, nutrient-rich waters rise to the surface, is most commonly associated with which of the following oceanic processes?**

A) Geostrophic currents

**B) Ekman transport driven by prevailing winds**

C) Tidal currents

D) Thermohaline circulation

**11. Which of the following is a key characteristic of hydrothermal vents found along mid-ocean ridges?**

**A) They are sites of high primary productivity fueled by chemosynthesis**

B) They emit relatively cold, oxygen-rich water

C) They are primarily associated with convergent plate boundaries

D) They are responsible for the formation of oceanic trenches

**12. What is the term for the boundary between two water masses with different properties, such as temperature and salinity?**

A) Thermocline

B) Halocline

C) Pycnocline

**D) Front**