

# Captains Tryouts: Dynamic Planet Test

Northwood High School

You will have 50 minutes to complete this test. Good luck!

Names:

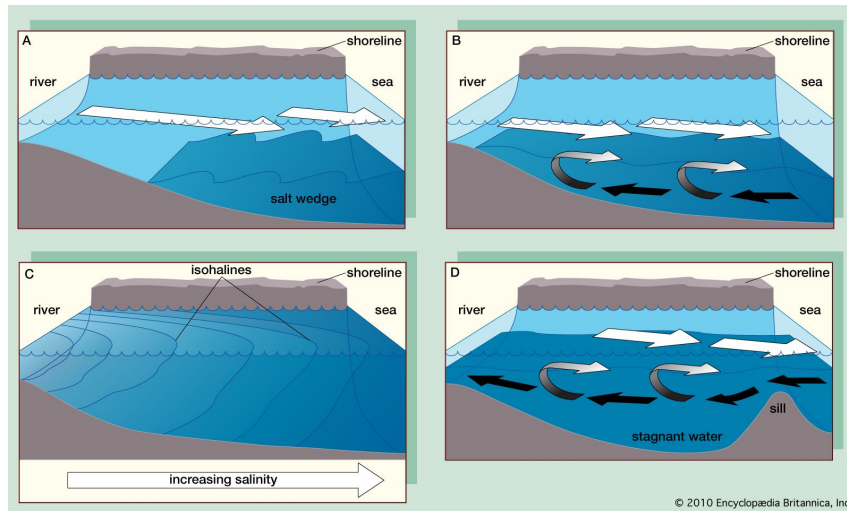
School:

Team Number: #

Score: \_\_\_\_/112

1. Who proposed the theory of atoll formation? Name the four major components/steps. (5 points)
2. Explain what patch reefs are and their ecological role. (2 points)
3. Describe the level of productivity found in the neritic zone. (2 points)
4. How do longshore currents form? (3 points)
5. How are estuaries classified based on geomorphology? (4 points)

6. Label A-D with their corresponding estuary types and describe each one. (8 points)



7. What is the CCD and what is the average value? (3 points)

8. What is the ecological impact of downwelling and how does it form? (2 points)

9. What is the role of thermohaline circulation in regulating global climate? (2 points)

10. How does an Ekman spiral form? (2 points)

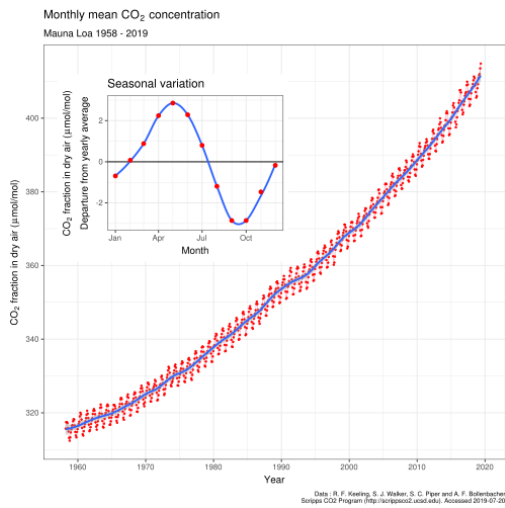
11. What are gyres and how do they form? (2 points)

12. What is the global significance of the existence of AABW? (2 points)

13. Why is the ocean salty? List and describe three sources of salts. (2 points)

14. Typically, saltier water is found in deeper layers of the ocean. Identify where on Earth this is not the case and explain why it occurs. (2 points)

15. Interpret the Keeling curve and the effects the trend depicted has had on the ocean's chemistry. (3 points)



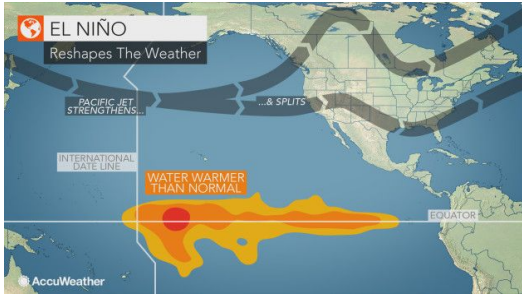
16. What are the top five most common dissolved ions in seawater? What is the average salinity in parts per thousand (ppt)? (6 points)

17. Explain the Marquet Principle. Which ions carry slight exceptions to this rule? (2 points)

18. Define residence time. Which elements tend to have longer ones in the ocean? Shorter ones? (2 points)

19. What is thermal expansion and the implications it has on sea levels? (2 points)

20. El Niño has significant impacts on ocean water temperature. Explain how these temperature fluctuations play a role in South America's economy. (2 points)



21. How does tidal resonance occur? (2 points)

22. What is significant about the Bay of Fundy in terms of oceanography? (1 point)

23. Wave height is affected by three main factors. List and describe them. (3 points)

24. What are the four types of breaking waves? Draw a diagram for each one. (5 points)

25. Differentiate between how spring and neap tides are formed. (2 points)

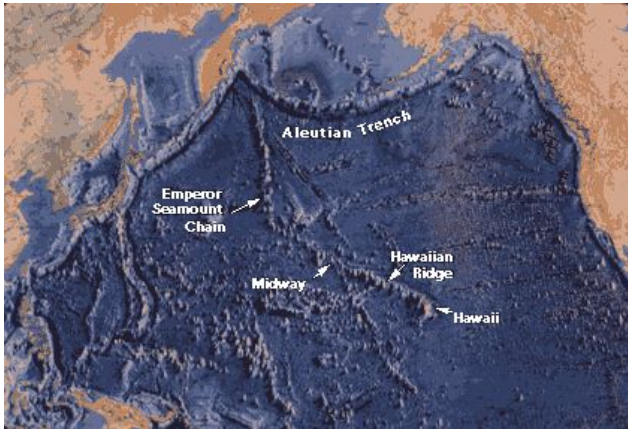
26. Draw a simplified diagram of the three-layer structure of ocean water. Explain what each of the layers means. (4 points)

27. What drives deep ocean circulation? (1 point)

28. Draw a diagram of a continental margin, labelling the continental shelf, continental slope, continental rise, and submarine canyon. Then, explain the characteristics of each of these four features. (4 points)
29. What are the two types of continental margins and how can they be differentiated? (3 points)
30. What is an abyssal plain? How much of Earth's surface is taken up by these (approximately)? (2 points)
31. Describe how abyssal fans form. Explain how the Bouma Sequence helps to explain how this process is driven. (2 points)
32. What is the difference between a seamount and guyot? (1 point)



33. The Hawaiian-Emperor Seamount Chain is located in the Pacific Ocean. Given the map below, in what direction does the Pacific Plate appear to move? (2 points)



34. What is a dredge used for in oceanography? (1 point)

35. How does a box corer work and what samples does it typically collect? (2 points)

36. What role does the ocean play in regulating shortwave and longwave radiation, and what global impacts does it have? To answer this question fully, please include descriptions of these radiations and examples. (4 points)

37. Why is the ocean blue? (2 points)

38. Explain the two main types of hydrothermal vents and how they differ chemically and physically.  
(2 points)

39. Name and describe three of the major marine sediment types. Give examples and sources for each.  
(9 points)

40. What are marine transgression and regression? (2 points)