Earth/Env. Science – Oceans Test Review **Spring 2014**

OBJECTIVES:
~ Describe the composition of ocean water.
~ Identify the sources of salts in ocean water and the factors that affect salinity.
~ Explain how ocean currents develop and the factors that affect them.
~ Describe the effects of ocean currents on the global distribution of heat.
~ Discuss upwelling and its effect on fish populations and the fishing industry.
~ Explain how deep ocean currents form and how they are connected to climate and climate change.
~ Identify the parts of a wave and how they are formed.
~ Describe erosional and depositional features of shorelines.
~ List the structures that help protect the shoreline.
~ Define tides and explain the forces responsible for their formation and impact.
~ Differentiate between spring and neap tides.
~ Describe the properties of each of the different life zones in the ocean.
~ Define plankton, nekton, and benthos. Classify organisms as plankton, nekton, or bethos.
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1. Approximately what percentage of Earth's surface is covered by oceans?
   71%
2. Which ocean is the largest?
   Pacific Ocean
3. What is the most abundant salt in ocean water?
   Sodium chloride (NaCl)
4. What processes are responsible for a decrease is the salinity of ocean water? Increase salinity?
   Increase in salinity= evaporation, formation of sea ice
   Decrease in salinity= melting of icebergs/sea ice, runoff from land, precipitation
5. What is the layer of water in which there is a rapid change of temperature with depth in the ocean called?
   thermocline
6. What are organisms that drift with ocean currents called?
   plankton
7. Which term describes the upper part of the ocean into which sunlight penetrates?
   Photic zone or photosynthetic zone
8. In what life zone of the ocean are phytoplankton usually found?
   Photic zone or photosynthetic zone
9. What is the use of light energy by organisms to convert water and carbon dioxide into organic molecules called?
   Photosynthesis
10. What is primary productivity?
    Production of organic molecules by photosynthesis or chemosynthesis
11. During which season does primary productivity reach its peak in polar oceans? In temperate oceans? Why are the seasons the same or different?

12. What are the two limiting factors to primary productivity in temperate oceans?
    Availability of nutrients and sunlight
13. Is there a thermocline present in high-latitude ocean waters? Why or why not?
    No; high-latitudes are near the poles where the temperature is cold even at the surface of the ocean
14. What is salinity? What units are used to express the salinity of ocean water?
    Amount of dissolved salts in ocean water; ppt (parts per thousand)
15. Explain the relationship between latitude and surface temperature of the ocean.
    Low latitudes (near equator) generally have higher surface temperatures than high latitudes (near poles)
16. What are two factors affect the density of ocean water? Does one affect density more than the other? If so, which one?

Temperature and salinity; temperature affects density more

17. What are the three main layers (zones) of the open ocean?
    Surface zone, mixed zone, deep zone
18. What is the difference between plankton and nekton?
    Plankton drift with the waves and ocean currents at the surface; Nekton can propel themselves through the water under the surface
19. Why is the neritic zone rich in life and biodiversity?
    Sunlight penetrates throughout the entire zone
20. Why do many fish in the abyssal zone locate food through chemical sensing?
    Sunlight does not penetrate the abyssal zone, so fish in this zone cannot see because there is no light.
21. What factors influence a region's photosynthetic productivity?

22. What limits primary productivity in tropical oceans? Why?
    Availability of nutrients; tropical oceans have a thermocline that resists the mixing of colder, nutrient rich deeper water with warmer, nutrient-lacking surface water
23. How do surface currents develop?
    Friction between the wind and the ocean; Coriolis effect
24. What is the Coriolis effect? How does it influence the direction of surface currents flowing in the ocean?
    Deflection of wind and currents to the left in the Southern Hemisphere and to the right in the Northern Hemisphere due to the rotation of Earth
25. How do ocean currents affect climate?
    Warm currents near landmasses help to moderate the temperatures (increase them and keep them relatively stable) of the area
26. Why is upwelling important?
    Colder, nutrient-rich deep water is allowed to come to the surface to replace warmer, nutrient-lacking surface water; when there are more nutrients, there is more variety in marine life
27. How are density currents formed?
    Convection currents resulting from the warm water at the equator moving towards the poles and the colder water at the poles moving towards the equator
28. The average surface temperature of water off the coast of Ecuador (west coast of South America) is 21.^{o}C. The average surface temperature of water off the coast of Brazil (east coast of South America) at the same latitude is about 27^{o}C. Explain why there is such a difference in water temperature between these areas at the same latitude.
    The Peru current (cold water current) flows north from the South Pole along the west coast of South America. The Brazil current (warm water current) flows south from the equator along the east coast of South America
29. From where do ocean waves obtain their energy?
    From the wind
30. What three quantities are used to describe a wave?
    Wavelength, wave height, and period
31. Which celestial bodies influence Earth tides?
    Moon and to a lesser extent, the Sun
32. What force is responsible for tides?
    gravity
33. What are the three types of tidal patterns? Briefly describe each.
    Semidiurnal tides- 2 high tides and 2 low tides per day. Height is relatively the same
    Diurnal tides- only 1 high tide and 1 low tide per day.
    Mixed tides- 2 high tides and 2 low tides per day. Height is different
34. How are sediments along the shoreline moved?
    Longshore current that moves parallel to the shore

35. By which processes do shoreline features form?
    Erosion and deposition
36. Name and briefly describe three examples of shoreline features formed by erosion.
    Wave-cut cliff-
    Wave-cut platform-
    Sea arch-
    Sea stacks-
37. Name and briefly describe three examples of shoreline features formed by deposition.
    Spit-
    Baymouth bar-
    Tombolo-
38. What structures can be built to protect a shoreline?
    Groins, breakwaters, sea walls