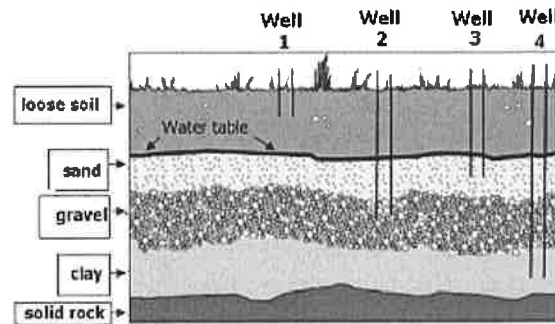


1. Wastes from hog farms run off into a nearby river. Which part of the river is *most likely* to experience the *highest* concentrations of pollutants?
- the area closest to the farms
 - the area upstream from the hog farms
 - the area around the river's tributaries
 - the area downstream from the farms
2. Approximately 70% of Earth's surface is covered with water. What percentage of this water is freshwater?
- 3%
 - 30%
 - 70%
 - 97%

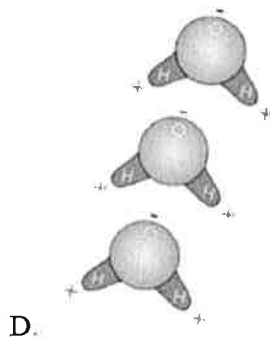
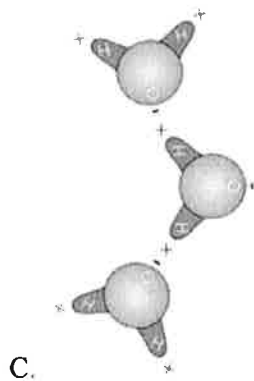
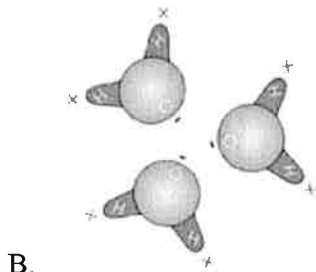
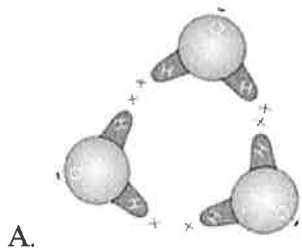
3. The diagram shows underground layers and several wells.



Which well is in an impermeable layer?

- 1
 - 2
 - 3
 - 4
4. Where would most of the freshwater available on Earth be located?
- glaciers and icebergs
 - ponds and lakes
 - rivers and streams
 - springs and aquifers

5. A unique property of water is polarity, which explains why molecules of water bond to each other. Which diagram shows the correct bond pattern between several molecules of water?

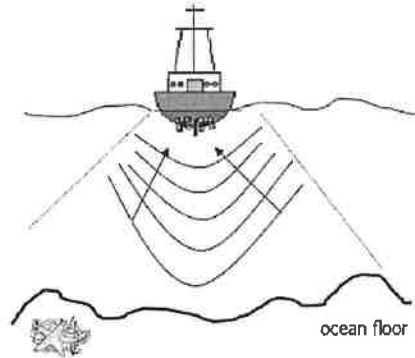


6. Which factor would *best* explain why the amount of water in an aquifer would decrease?
- higher amounts of precipitation in an area around the aquifer
 - more people using water from the aquifer
 - water restrictions on groundwater use near the aquifer
 - an increase in the percolation of water above the aquifer
7. Which statement *best* describes the hydrosphere?
- It includes only the water on the Earth's surface.
 - It includes only freshwater on the Earth's surface.
 - It includes water on the Earth's surface, underground, and in the atmosphere.
 - It includes fresh and salt water on the Earth's surface and underground.
8. What allows ice to float in water?
- Ice has a higher density than water.
 - Ice has a lower density than water.
 - Ice has high cohesion.
 - Ice has low cohesion.

9. Which two properties of water *best* explain why water molecules have surface tension?
- A. cohesion and polarity
 - B. density and capillary action
 - C. capillary action and adhesion
 - D. cohesion and adhesion
10. Which statement about water on Earth is true?
- A. There is more water underground than in the oceans.
 - B. More freshwater is in the atmosphere than on the surface.
 - C. There is more water in rivers and streams than in the oceans.
 - D. More freshwater is located underground than on the surface.
11. What allows certain types of spiders to walk on the surface of a lake?
- A. Adhesion between the water molecules allows for surface tension.
 - B. Cohesion between the water molecules allows for surface tension.
 - C. Cohesion between the water molecules allows for capillary action.
 - D. The polarity of water allows for adhesion between the water molecules.
12. What effect does precipitation have on the water table?
- A. Precipitation causes the water table to rise.
 - B. Precipitation causes the water table to lower.
 - C. Precipitation has no effect on the water table.
 - D. Precipitation keeps the water table at a constant level.
13. The population of photosynthetic organisms is higher in the neritic zone and surface waters than in the deep ocean. Which statement *best* explains the reason for this?
- A. There is more space for plants to grow in these areas of the ocean.
 - B. There is more dissolved oxygen for plants in these areas of the ocean.
 - C. The availability of sunlight and nutrients supports photosynthetic organisms.
 - D. The high salinity and cool temperature supports photosynthetic organisms.

14. Which statement *best* describes how nutrients move in the ocean as a result of upwelling?
- A. Nutrients move from estuaries into the intertidal zone.
 - B. Nutrients move from warm, shallow areas to deep, colder areas.
 - C. Nutrients move from the neritic zone to the intertidal zone.
 - D. Nutrients move from deep, colder areas to warm, shallow areas.
15. What is the *most likely* result of overfishing in oceans?
- A. disrupted balance in ocean food webs
 - B. increased reproduction of fish species
 - C. disrupted ocean temperature patterns
 - D. increased ocean food web productivity

16. The diagram shows a boat using sonar to gather information in the ocean.



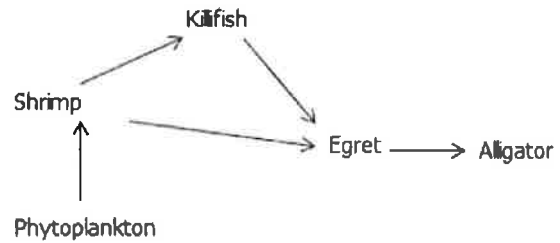
What is *most likely* being measured with this technology?

- A. ocean depth
 - B. ocean temperature
 - C. pH level
 - D. turbidity level
17. Which statement about oceans is true?
- A. Pressure is lower on the ocean floor.
 - B. Water temperature increases with depth.
 - C. More photosynthesis occurs in the warmer surface waters.
 - D. The colder, deeper waters are less dense than the surface waters.

18. A snaggletooth fish has a glowing lure that extends from its chin to attract prey. In which ocean zone does this fish *most likely* live?
- A. bioluminescent zone
 - B. intertidal zone
 - C. neritic zone
 - D. oceanic zone
19. Which *best* describes the conditions in the intertidal zone?
- A. few predators, low light, and temperature
 - B. high water pressure and limited sunlight
 - C. brackish water and high amounts of nutrients
 - D. frequent changes in salinity and temperature
20. Which organism is an example of a benthos?
- A. jellyfish
 - B. seal
 - C. shark
 - D. starfish
21. Which ability is *most* valuable for survival in the deep ocean?
- A. ability to bioluminesce
 - B. ability to photosynthesize
 - C. ability to survive low pressure
 - D. ability to echolocate
22. Which organism would be found in an intertidal zone?
- A. coral
 - B. crab
 - C. dolphin
 - D. squid
23. Which statement *best* describes an estuary?
- A. An estuary is the extension of a continent located underwater.
 - B. An estuary is land that is exposed at low tide and is underwater at high tide.
 - C. An estuary is a partly enclosed body of water where a river meets the ocean.
 - D. An estuary is a deep body of water that contains large animals.

24. Which organism is a link between an aquatic food web and a terrestrial food web?
- A. clam
 - B. dolphin
 - C. penguin
 - D. shark
25. Which conditions would *most likely* occur as a result of ocean upwelling?
- A. increased nutrients in surface waters
 - B. decreased nutrients in surface waters
 - C. increased temperatures in surface waters
 - D. decreased photosynthesis levels in surface waters

26. Study the food web.



Which organism is the link between the aquatic and terrestrial food webs?

- A. alligator
- B. egret
- C. killifish
- D. shrimp

27. A science class uses the table to identify and record their observations.

AQUATIC ECOSYSTEMS	
Coral Reef	<ul style="list-style-type: none"> shallow: less than 46m deep, low pressure sunlight penetrates clean, warm, saline water strong waves shape defined by coral growth wildlife: fish, sponges, eels, jellyfish, crustaceans, and turtles
Neritic Zone (Continental Shelf)	<ul style="list-style-type: none"> shallow: less than 200m deep low pressure light penetration varies trenches and caves wildlife: fish, crustaceans other: zooplankton, seaweed
Abyssal Plain (Deep Ocean)	<ul style="list-style-type: none"> deep: 2,000 to 6,000m high pressure cold no light penetration decomposers, tube worms, crustaceans
Kelp forest	<ul style="list-style-type: none"> shallow: 15-40m, low pressure cold waters high light penetration kelp (marine algae) wildlife: sea urchins, sea otters, sea lions, whales
Estuary	<ul style="list-style-type: none"> areas where freshwater meets the ocean salinity varies grasses, algae, phytoplankton wildlife: crustaceans, shellfish, fish feeding areas for many types of water fowl

The class observes herons, egrets, and other birds eating from the water. Which aquatic ecosystem should they record?

- A. coral reef
- B. estuary
- C. kelp forest
- D. neritic zone

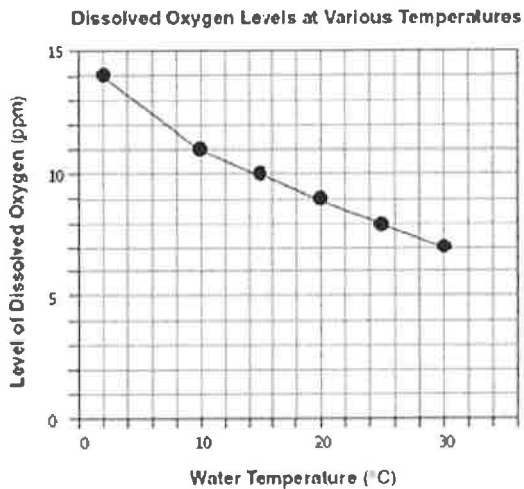
28. Which factor *best* explains why estuaries provide a safe environment for young animals?

- A. Constant changes in salinity and temperature prevent predators from surviving.
- B. High pressure, cold temperatures, and lack of light prevent many predators from surviving.
- C. Pollutants from inflowing rivers provide nutrients that support the development of young animals.
- D. Estuaries are rich in nutrients and contain roots and grasses that provide shelter for young animals.

29. In what ocean zone do coral reefs grow?

- A. estuarial zone
- B. intertidal zone
- C. neritic zone
- D. oceanic zone

30. Review the graph of dissolved oxygen and temperature levels in a lake.



What relationship exists between dissolved oxygen and the temperature of water?

- A. Temperature has an unpredictable effect on the amount of oxygen that can be dissolved.
- B. Temperature has no effect on the amount of oxygen that can be dissolved in water.
- C. As the temperature of water increases, the amount of dissolved oxygen increases.
- D. As the temperature of water increases, the amount of dissolved oxygen decreases.
31. What effect can detergents have on waterways?
- A. They might cause an increase in nitrates.
- B. They might cause an increase in dissolved oxygen.
- C. They might cause a decrease in sediment.
- D. They might cause a decrease in salinity.
32. What initially happens to the water quality in a lake when there is an increase in nitrates?
- A. The dissolved oxygen levels will increase.
- B. The pH will remain neutral.
- C. The temperature will increase.
- D. The turbidity will decrease.
33. Why do high nutrient levels reduce water quality for fish and other organisms?
- A. Higher nutrients can increase turbidity.
- B. Higher nutrients can increase pH.
- C. Higher nutrients can increase dissolved oxygen.
- D. Higher nutrients can decrease water temperature.

34. What effect can sewage spills have on waterways?
- They might cause a decrease in temperature.
 - They might cause a decrease in nitrates.
 - They might cause an increase in soil sediments.
 - They might cause an increase in phosphates.
35. Which conditions indicate that a water system is healthy?
- high dissolved oxygen, low temperature, and high nitrates
 - low dissolved oxygen, high temperature, and low nitrates
 - low temperature, low dissolved oxygen, and high numbers of bioindicators
 - high numbers of bioindicators, low temperature, and high dissolved oxygen
36. Which environmental problem is the result of excess nitrates in a lake?
- acidification
 - eutrophication
 - permineralization
 - salinization

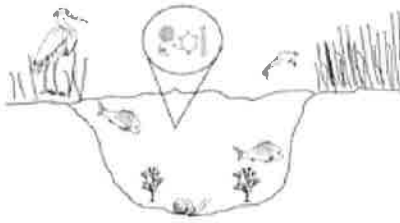
37. The table provides information about water conditions and trout survival.

Water Conditions for Trout Survival		
Factor	Waters Without Trout	Waters Containing Trout
Dissolved Oxygen	> 6.0 mg/L daily	> 7.0 mg/L daily
pH	6.0 – 9.0	6.0 – 9.0
Temperature	<28° C–33° C	<24° C

Which set of conditions would be *best* for the survival of trout?

- 5.5 mg/mL DO and pH of 8.0
 - pH of 7.0 and 22°C
 - pH of 7.0 and 30°C
 - 6.0 mg/mL DO and pH of 5.5
38. Dissolved oxygen levels in water sources are dependent on several factors, including temperature and concentration of plant and animal species. Which environment would *most likely* have the highest levels of dissolved oxygen?
- a warm environment in which aquatic animal populations are high, and plant growth is low
 - a warm environment in which aquatic animal populations are low, and plant growth is high
 - a cool environment in which aquatic animal populations are high, and plant growth is low
 - a cool environment in which aquatic animal populations are low, and plant growth is high

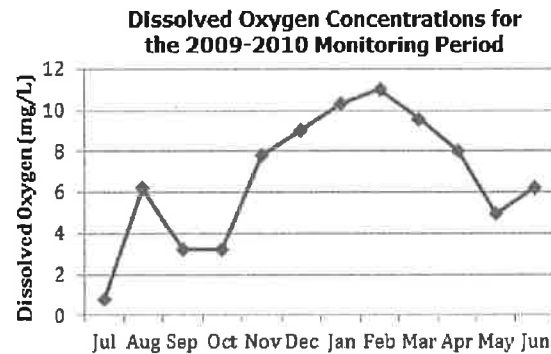
39. The diagram shows life in a typical pond.



What *most likely* would happen if fertilizers from a nearby farm pollute this pond?

- A. The fish would be most affected because they spend more time in the water.
- B. The snails would die because the fertilizers will sink to the bottom of the pond.
- C. Algal blooms would occur which would eventually lower the dissolved oxygen in the pond.
- D. The plankton would be most affected because they are the smallest organisms in the pond.

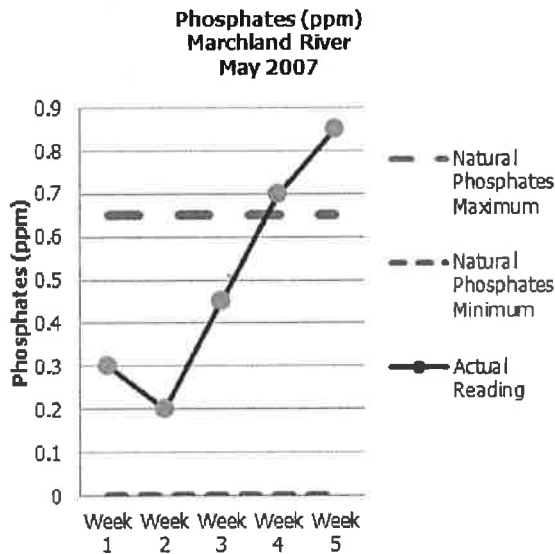
40. The graph shows dissolved oxygen concentrations at a sampling site in the Neuse River watershed.



What *most likely* caused the low dissolved oxygen concentrations in July?

- A. high nitrates
- B. low nitrates
- C. high temperatures
- D. low temperatures

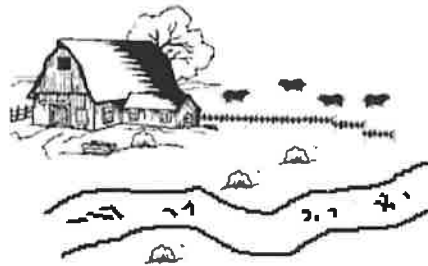
41. Scientists display their data for phosphates in the Marchland River in a graph.



If the trend continues, what recommendation can environmental scientists make that will help the river?

- A. Increase salt concentration.
- B. Ban certain fertilizers.
- C. Dam the river.
- D. Decrease water movement.
42. What would *most likely* happen to the water in a stream if sediment from a nearby construction site flowed into the stream?
- A. The pH level would increase.
- B. The bioindicator species would increase.
- C. The turbidity would increase.
- D. The temperature would increase.

43. The hog farm in the diagram is located near a river.

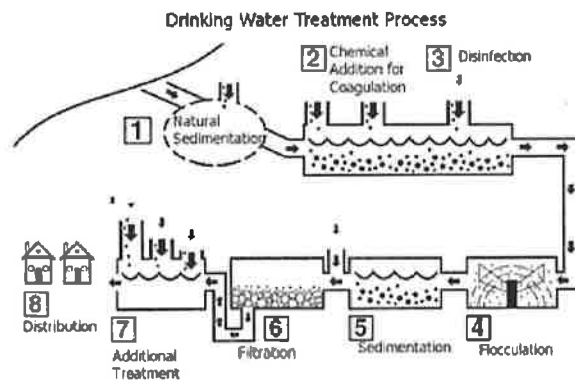


Which statement describes a source of non-point pollution that may threaten the river?

- A. Animals from the farm bathe in the river, carrying dirt on their bodies.
- B. The farmer pumps water from the river onto his crops for irrigation.
- C. Animal wastes run off from the farmland into the river.
- D. Water from farm sprinklers trickles into the river.
44. Which example represents a point source of pollution?
- A. acid rain caused by exhaust from vehicles
- B. chemical runoff from lawns
- C. oil and gasoline discharged from cars
- D. heated water released from a power plant

45. Which example represents a non-point source of pollution?
- chlorine released from a chemical company
 - chemical runoff from lawns
 - oil released from a leaking underground pump
 - wastewater leaking from a pipe
46. Fertilizer is one type of non-point source pollutant. If it is applied in excess just prior to a rainstorm and makes its way into a river or lake, what would *most likely* result?
- an undergrowth of aquatic plants due to the toxic effects of the fertilizer
 - an overgrowth of algae which can suffocate fish and other aquatic wildlife
 - an extreme growth of the fish population in response to the added nutrients
 - no change in either fish or aquatic plant populations due to the excess rainwater

47. The diagram shows the steps in the process used to treat drinking water.



What happens to contaminants in water during steps 4-6?

- They chemically combine and are neutralized.
 - They make other particles more soluble in water.
 - They are mixed with chemicals and removed from water with skimmers.
 - They clump together in flocs, which either settle or are filtered from water.
48. What would be the *best* method for monitoring algae blooms?
- buoys
 - GPS
 - satellites
 - sonar

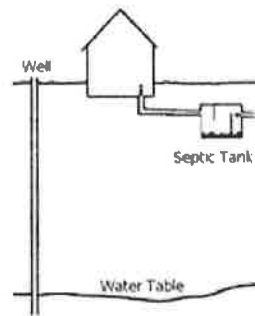
49. A family tests water from their well to check the quality of their drinking water. The table lists the results of their test as well as the acceptable limits for substances.

Substance	Drinking Water Sample	Acceptable Limit
lead	0.2 ppm	0.015 ppm
copper	0.006 ppm	1.3 ppm
pH	5.0	6.5-8.5
coliform count	5 out of 5 samples positive	No more than 5% of samples taken in a month can be positive

Based upon the data, what conclusion can *most likely* be made?

- A. The family's septic tank could be polluting their well.
- B. The water is safe to drink for all substances tested.
- C. The concentration of lead in the sample is too low to be problematic.
- D. The pH of the family's water supply is higher than the acceptable limit.

50. The diagram shows a house with a well and a septic tank.



What effect would a leaking septic tank have on the people using the house and well?

- A. The septic tank contents may seep into the groundwater and contaminate the well.
- B. The leak will decrease the water pressure in the pipes of the house.
- C. The septic tank contents may cause damage to the house's pipes due to minerals in hard water.
- D. The leak will have no effect because bacteria in the tank treated the waste.