By: Adit Ghosh

Scioly Study Summer Session 2013
Water Quality Test

Part A:

Instructions: Fill in the blank for the correct term to complete the sentence.

1. _____ is the term to describe water's attraction to other water particles.
2. _____ is the term to describe water's attraction to other other substances.
3. _____ is the term that describes the movement of water through spaces in porous material.

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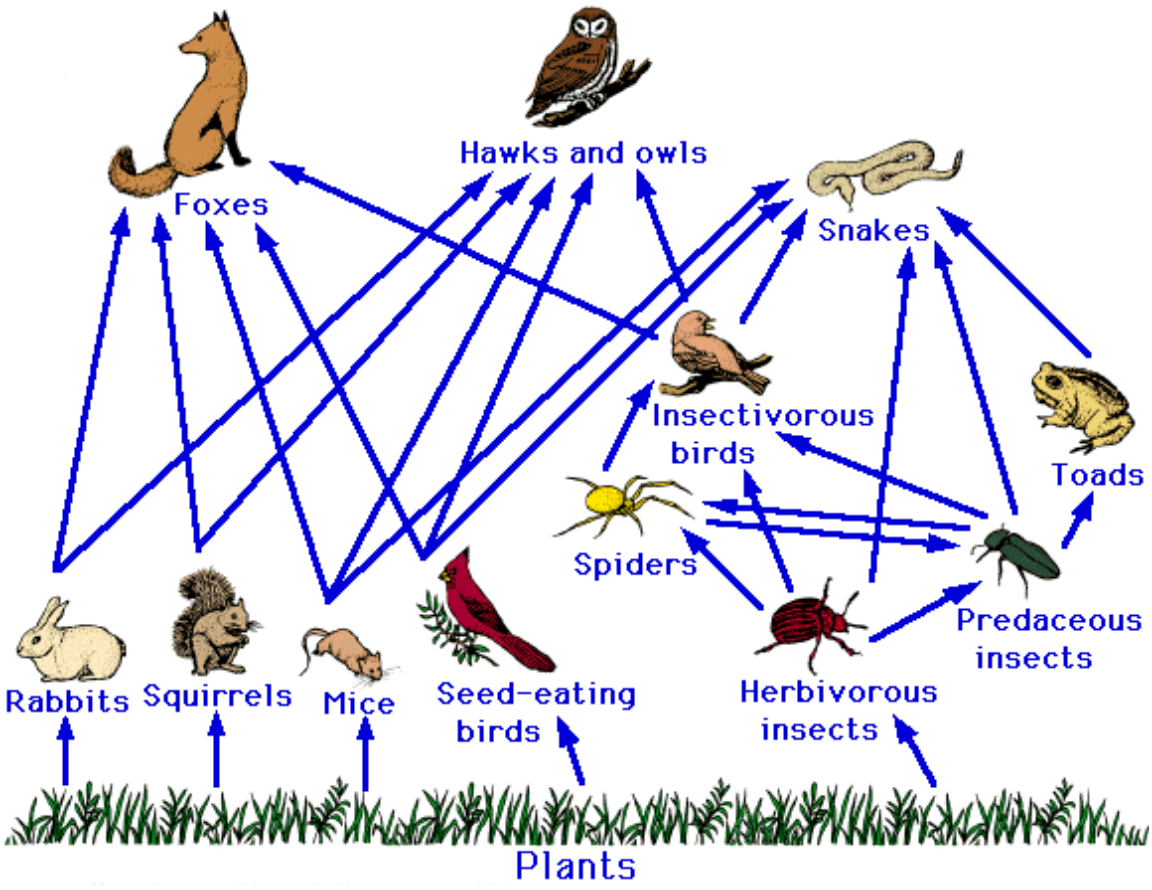
Instructions: Answer the following questions pertaining to the food web given below.



4. The rabbits in this diagram are:
    a. Producers
    b. First Order Consumers
    c. Second Order Consumers
    d. Third Order Consumers
5. The toads in this diagram are:
    a. Producers
    b. First Order Consumers
    c. Second Order Consumers
    d. Third Order Consumers

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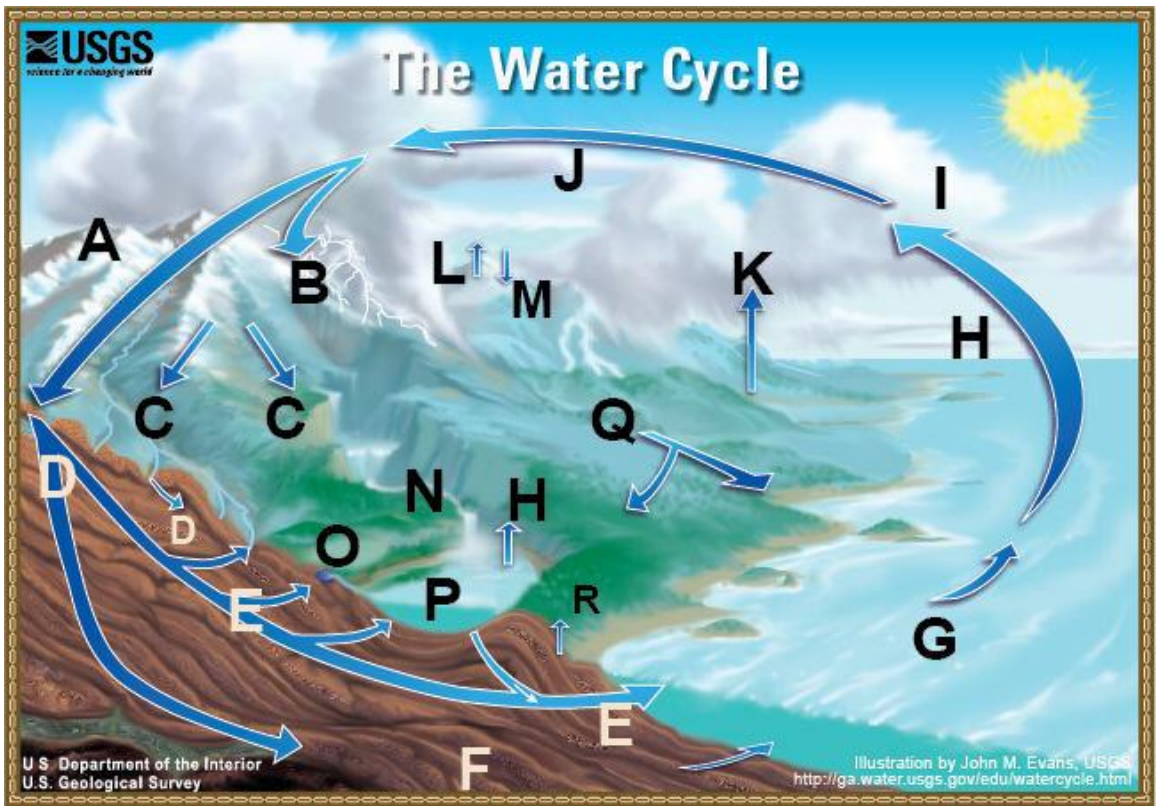
Insructions: Write the correct answer next to the letter corresponding to the Water Cycle diagram.

6.



A.
B.
C.
D.
E.
F.
G.
H.
I.
J.
K.
L.
M.
N.
O.
P.

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Instructions: Correctly circle the answer for each multiple-choice question relating to the Nitrogen Cycle.

7. Denitrification is the term to describe:
    a. Gaseous Nitrogen to Nitrate
    b. Nitrate to Ammonia
    c. Ammonia to Nitrate
    d. Nitrate to Gaseous Nitrogen

8. Nitrification is the term to describe:
    a. Gaseous Nitrogen to Nitrate
    b. Nitrate to Ammonia
    c. Ammonia to Nitrate
    d. Nitrate to Gaseous Nitrogen

9. Nitrogen Fixation is the term to describe:
    a. Gaseous Nitrogen to Nitrate
    b. Nitrate to Ammonia
    c. Ammonia to Nitrate
    d. Nitrate to Gaseous Nitrogen

10. Ammonification is the term to describe
    a. Gaseous Nitrogen to Nitrate
    b. Nitrate to Ammonia
    c. Ammonia to Nitrate
    d. Nitrate to Gaseous Nitrogen

Instructions: Complete each sentence relating to the Phosphorous Cycle.

11. _____ are referred to as inorganic phosphorous.

12._____ Phosphorous can change from one form to another through cycling.

13. _____ is the name for the PO_4 molecule.

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Instructions: Next to the number on the diagram, write the correct letter of the term being described. The letter choices are given above the numbers..

14.

A. Advanced Treatment
B. Disinfection
C. Preliminary Treatment
D. Secondary Treatment
E. Primary Treatment
F. Solids Handling

1.
2.
3.
4.
5.
6.

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Instructions: Circle the best answer for the following multiple-choice questions about Potable Water Treatment.

15. When lime and alum are added during the chemical stage of Potable Water Treatment, the name of the sticky particles formed are:
    a. Cuac
    b. Nicks
    c. Farads
    d. Floc

16. Which stage of Potable Water Treatment removes dirt and other particles first?
    a. Flocculation
    b. Coagulation
    c. Sedimentation
    d. Disinfection

17. What is added to kill microbes in the final stage of Water Treatment?
    a. Fluorine
    b. Chlorine
    c. Lime
    d. Alum

18. What is this "final stage" of Potable Water Treatment called?
    a. Disinfection
    b. Filtration
    c. Coagulation
    d. Flocculation

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Instructions: Complete the sentence for each question pertaining to food pyramids, food webs, and food chains.

19. _____ is the name for the type of pyramid that counts that organisms at each trophic level.

20._____ is the name for the type of pyramid that total mass of all the organisms in each trophic level.

Instructions: Write the correct answer next to each short answer question.

21. What are the two ways in which estuaries are classified?

22. What is the name given to areas of equal salt concentration?

23. Name 3 things that are caused by water movement in estuaries.
    a.
    b.
    c.

24. Name 3 things that the amount of mixing between freshwater and seawater depend on.
    a.
    b.
    c.

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Instructions: Write the name of each estuary that is being described.

25. Ice melted and the water levels rose:

26. Valleys that have been cut deeper by moving glaciers, and then invaded by the sea:

27. Created when the sea fills in the basin created by sinking land:

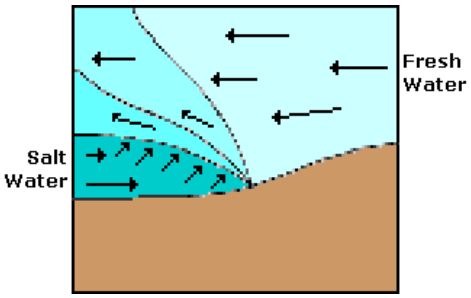
28. Sand-bars built along the coastline.

29. Mississippi, Hudson, and Columbia Rivers are examples of this type of estuary:

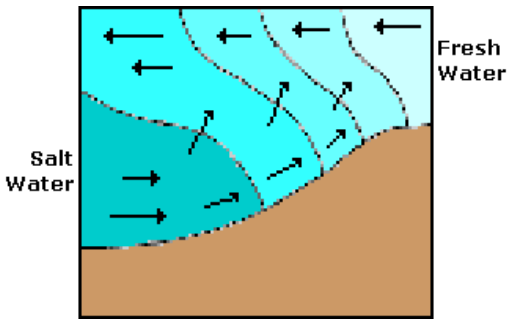
30. Puget Sound, San Francisco Bay, and the Chesapeake Bay are examples of this type of estuary:

31. The Delaware Bay is an example of this strong tidal-mixing estuary.

32. What is the name for the estuary shown below?



33. What is the name for the estuary shown below?



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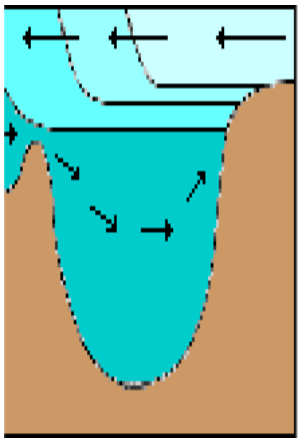
34. What is the name for the estuary shown below?

Fresh Water

Salt water



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Instructions: Write the common name for each invasive species next to their respective picture.

35.

36.

37.

38.

39.

40.

41.

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42.

Photo Credit: Lee Mecum

Instructions: Write the correct term from the word bank provided below next to the definition describing the word.

Word Bank:			
Population	Community	Ecosystem	Biosphere

43. Group of individuals of the same species occupying a common geographical area.

44. Two or more populations of different species occupying the same geographical area.

45. The portion of the earth that contains living species.

46. A community plus its abiotic factors.

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Instructions: Define the following terms to the best of your abilities:

47. Ecological Succession-

48. Potential Niche-

49. Realized Niche-

50. Wetland-

51. Watershed/ Drainage Basin-

Instructions: Answer the following short answer questions about the classifications of lakes.

52. What classification of lake is very productive?
53. What classification of lake has clear water?
54. What classification of lake has low productivity?
55. What classification of lake has an occasional algal bloom?
56. What classification of lake may experience oxygen depletion?
57. What classification of lake has very productive phytoplankton?
58. What classification of lake has good fishery?

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Instructions: Answer the following free-response questions to the best of your ability.

59. What are some watershed management plans that are being implemented?

60. Name three different types of wetlands and describe each one.

61. Name the four different types of aquatic organisms classified by their feeding technique.

62. Briefly explain fall turnover.

63. What are the three thermal layers associated with lake turnover? Describe each layer in detail as well.

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Part B:

Instructions: Write the common name, life stage, and class for each benthic macroinvertebrate next to the picture.

64. 

65. 

66. 

67. 

68.

69.

70.

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Instructions: Write the correct letter next to each macroinvertebrate name.

A. Shredder
B. Collector
C. Scraper/Grazer
D. Predator

71.____Water Penny

72.____Gilled Snail

73.____Dobsonfly

74.____Cranefly

75.____Blackfly

76.____Tubifex

77. ____Air Breathing Snail

78.____Giant Water Bug

79.____Mosquito

80.____Dragonfly

Instructions: Write whether each statement is true/ false next to the statement. If the statement happens to be false, then replace/ add a word to make the state true. Inserting "not" to make the statement true is not an acceptable answer.

81. _____Leeches are Hermaphroditic.

82._____Mosquito larvae are sometimes called leatherjackets.

83._____Scuds indicate Calcium-rich water.

84._____Flatworms are know as isopods.

85._____Male Dobsonflies are capable of biting.

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Part C:

Instructions: Correctly fill in the blank for each question pertaining to the Temperature test.

86. Temperature is measured with a _____.

87. Warm water holds _____ Oxygen than cold water.

88. The rate of photosynthesis _____ with a decrease in water temperature.

89. As temperature increases, the metabolic rates of organisms _____.

90. A severe increase in temperature indicates _____ pollution.

Instructions: Correctly fill in the blank for each question pertaining to the pH test.

91. A pH of 7 is _____.

92. The ideal pH range for aquatic organisms is _____ to _____.

93. Acidic waters have a larger amount of _____ ions than _____ ions.

94. _____ is an organism that can survive a pH range of 1 to 13.

95. The pH scale is _____, so it is ten-fold for each unit increase/decrease.

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Instructions: Correctly fill in the blank for each question pertaining to the Turbidity test.

96. Turbidity can be measured with a _____ disk, in addition to a turbidimeter and nephelometer.

97. The rule of thumb is that light penetrates ____ to ____ times the secchi disk depth.

98. _____ are natural polyphenol compounds that are found in plants, which protect them from predation. This bitter compound has found its way into waterways, thereby increasing the cloudiness of the water.

99. NTUs are _____ Turbidity Units, and they are more conventionally used

than JTUs (_____ Turbidity Units.)
100. Turbidity measures the _____ of water.

Instructions: Correctly fill in the blank for each question pertaining to the Dissolved Oxygen test.

101. The largest source for DO in aquatic habitats is _____.

102. Both temperature and _____ affect DO readings.

103. An increase in the decomposition of organic matter would _____ DO readings.

104. An increase in photosynthesis would _____ DO readings.

105. The addition of large, overhanging trees would most probably _____ DO readings, if they don't increase the turbidity very much.

Instructions: Correctly fill in the blank for each question pertaining to the Biochemical Oxygen Demand test.

106. BOD is a _____- day test.

107. Other than being done over a long period of time, BOD is very similar to the ____ _____ test.

108. Human wastes _____ BOD.

109. Warmer water _____ BOD.

110. A high BOD would _____ the quality of a water body.

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Instructions: Correctly fill in the blank for each question pertaining to the Phosphate test.

111. The Phosphorous _____ allows for the circulation of Phosphates in an aquatic environment.

112. Excess phosphates lead to _____.

113. Plant and algal growth _____ with an increase in phosphates.

114. Phosphorous is known as the _____-_____ nutrient in ecosystems.

115. The chemical formula for the phosphate anion is _____.

Instructions: Correctly fill in the blank for each question pertaining to the Nitrate test.

116. _____ and _____ are the only two usable forms of Nitrogen for organisms.

117. Inorganic forms of Nitrogen include _____, _____, and _____.

118. Nitrates are necessary because they build _____ for plants and animals.

119. Bacteria in the _____ species convert NH_4 to NO_2.

120. The opposite of nitrification and fixation is _____.

Instructions: Correctly fill in the blank for each question pertaining to the Total Solids test.

121. _____ solids cannot pass through a filter.

122. _____ solids can pass through a filter.

123. Calcium is an example of a _____ solid.

124. A high amount of total solids increases _____, an important Water Quality test.

125. Silt and clay are examples of _____ solids.

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Instructions: Correctly fill in the blank for each question pertaining to the Fecal Coliform test.

126. Fecal coliform lives in the _____ of warm-blooded animals.

127. Fecal Coliform is measured per _____ mL of water.

128. High temperatures will _____ Fecal Coliform counts.

129. _____ fever is associated with high Fecal Coliform counts.

130. _____ septic tanks are a primary source of Fecal Coliform.

Instructions: Correctly fill in the blank for each question.

131. The _____test measures the salt concentrations in a body of water.

132. _____ is added to water treatment facilities to enhance taste and prevent tooth decay.

133. _____ is a good measure of photosynthesis in a body of water.