

OREGON ENVIROTHON 2022

AQUATIC ECOLOGY TEST

TEAM: # _____

Total Points: _____/ 50

Note to teams: If you notice that a kit is missing pieces, please notify one of the test administrators.

Part I. Hands-On Analysis

1. Collect a water sample and analyze it with the test kits. Record the values you find for the following parameters: (5 points)

- a. Temperature: _____
- b. pH: _____
- c. Dissolved Oxygen: _____
- d. Phosphate: _____
- e. Nitrate: _____

2. What is the water quality classification for this sample according to the Oregon Water Quality Standards for Salmon and Steelhead? (1 point)

Class AA

Class A

Class B

3. Identify the macroinvertebrate within the sample dish; include both the name and the life stage, common names are allowed. For example, "*mosquito larvae*." (2 pts)

4. Based on the macroinvertebrate in the sample dish, do you believe that this sample came from the same source as the water sample? Explain why or why not. (2 points total; 1 for yes/no from sample, 1 for explanation)

__ / 10 pts

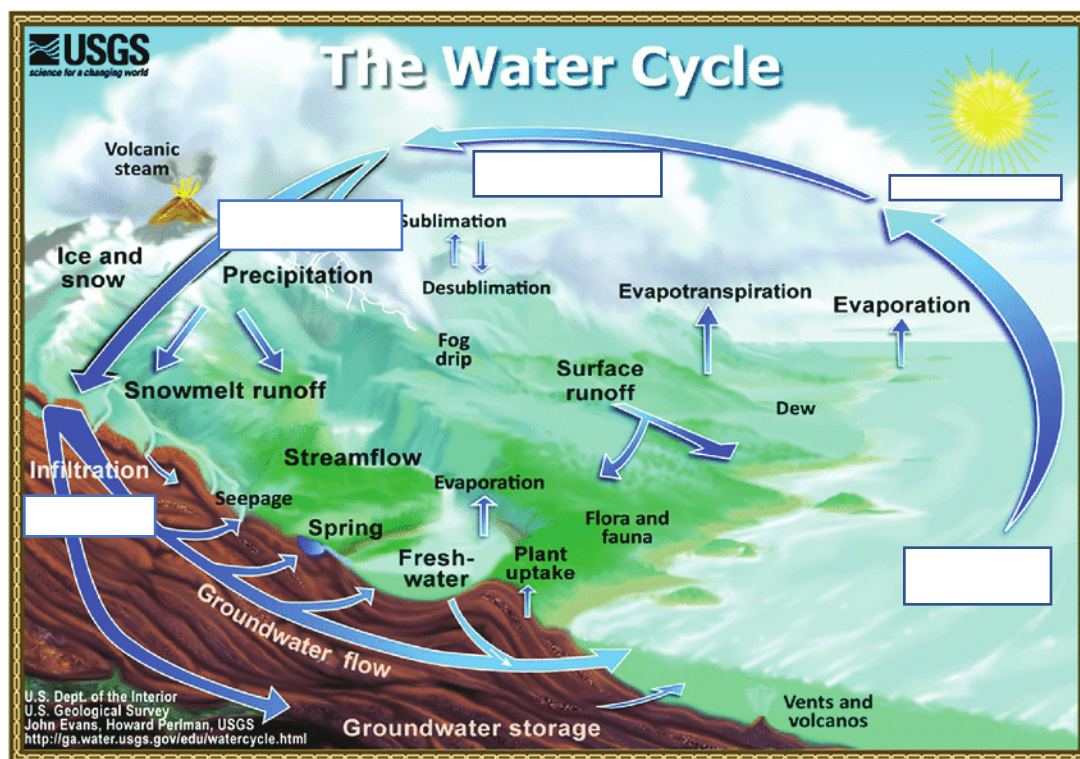
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Part II. Wastewater Treatment

5. Briefly (1 sentence) describe the treatment that occurs at the following wastewater plants. (2 point):
- 1) Chemical/Physical plants:
 - 2) Biological plants:
6. Of the two types of wastewater treatment plants above, which system is better for treating wastewater from households (1 point)?
7. Name two ways that bacteria, such as E. coli, can enter a waterway. (2 points)
8. How do harmful concentrations of lead generally get into drinking water? (1 point)
- a) Lead filled paint cans are poured into water sources.
 - b) Lead is a natural byproduct from decaying material that cannot be filtered out at treatment facilities.
 - c) Lead is leached from old pipes that deliver water to homes/businesses.
 - d) Lead is added to the water in an effort to filter out other chemicals.
9. Stormwater runoff can introduce pollutants to water sources. Name five pollutants that can be found in stormwater runoff. (5 points)

Part III. The Water Cycle



10. Use 3 of the following words to fill in the missing water cycle components (3 pts):
 Condensation Oceans Atmosphere Infiltration Precipitation

11. Match the following components of the water cycle with the definition on the right (4 points):

- | | |
|--------------------------|---|
| ___ Evapotranspiration | a. Water replenishes aquifer |
| ___ Ground-water storage | b. Solid state water into gaseous |
| ___ Sublimation | c. Directly from plants into atmosphere |
| ___ Infiltration | d. From a gaseous state to a liquid |
| | e. Pooled subsurface liquid |

12. Reduction in runoff would NOT be caused by which of the following? (1pt)

- | | |
|--------------------|----------------------|
| a. Porous surfaces | b. timber harvesting |
| c. Buffer strips | d. Cover cropping |

__ / 8pts

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Part IV. River Systems

13. Which term is the area that occurs along the edges of waterways and waterbodies? (1 pts)

- a. savanna
- b. riparian zone
- c. wetland
- d. prairie

14. Match the component of a healthy streamside habitat (left) with its most important function (right). (4 pts)

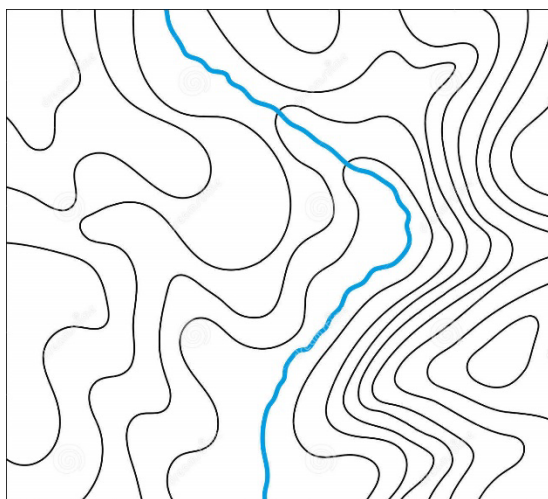
- | | |
|-------------|-------------------------------|
| ___ Berries | a. water storage & filtration |
| ___ Canopy | b. erosion control |
| ___ Roots | c. livestock access |
| ___ Soil | d. wildlife food |
| | e. Shade |

15. Match the terms on the left with the definitions or examples on the right: (4 pts)

- | | |
|------------------|-----------------------------------|
| ___ Pervious | a. Shallow, fast, turbulent water |
| ___ Impervious | b. The space between |
| ___ Interstitial | c. Asphalt |
| ___ Oxbow | d. River bend |
| | e. Gravel drives |

16. On the image below (3 pts):

- a. Place an X on top of the hill
- b. Circle the area with the steepest slope.
- c. Place arrow(s) indicating the direction of flow.



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Part V. Nutrients, Food Chains/Webs

17. Explain how algal blooms occur and what effect this has on dissolved oxygen. (2 pts, 1 pt for how algal blooms happen, 1 pt for effect)

18. Identify the trophic level that each of the following organism are at in the food chain. ? (4 pts)?

- a. Bald Eagle
- b. phytoplankton
- c. bass
- d. zooplankton

19. Give an example of a Pacific Northwest freshwater keystone species (1 pt.) and explain the impact on its ecosystem (2 pts):