CLASS NOTES

• Ever since the outgassing of water vapor ________________ years ago, Earth has been ________________ its water supply
  • Earth’s has not gained or lost water since

• The Water Cycle - ____________________________________________________________________________________
  • The water cycle is fueled by __________________________ [insolation] and gravity

• Evaporation - ______________________________________________________________________________________

• Condensation - _____________________________________________________________________________________

• Transpiration - _____________________________________________________________________________________

• Precipitation - _____________________________________________________________________________________
  • Examples: rain, snow, sleet and hail

• When precipitation falls it can:
  • Be stored on land surfaces as ice and snow
  • ___________________________ into the upper parts of the lithosphere
  • Flow over Earth’s surface as __________________________
  • Be ___________________________ or undergo ___________________________
The Water Cycle

- Infiltration -

- Factors Affecting Infiltration:
  1. Slope of the Land - steeper slopes do not give time for water to infiltrate the ground
  2. Degree of Saturation - the amount of water already in the ground
  3. Porosity -
  4. Permeability -
  5. Capillarity -
  6. Vegetation - plants absorb water from the ground

![The Water Cycle Diagram](image-url)
PART I QUESTIONS: MULTIPLE CHOICE

Base your answers to questions 1 through 3 on the diagram below, which shows a model of the water vapor cycle. Letters A through F represent some processes of the water cycle. Letter X indicates the top of the underground zone that is saturated with water.

1. Which process is represented by letter F?
   a. capillarity
   b. infiltration
   c. condensation
   d. vaporization

2. What does letter X represent?
   a. the water table
   b. a flood plain
   c. sea level
   d. impermeable rock

3. If the surface soil is saturated and precipitation increases, there will be
   a. a decrease in the amount of groundwater
   b. a decrease in the surface elevation of the lake
   c. an increase in the rate of capillarity
   d. an increase in the amount of runoff
4. During a rainstorm, when soil becomes saturated, the amount of infiltration
   a. decreases and runoff decreases
   b. decreases and runoff increases
   c. increases and runoff decreases
   d. increases and runoff increases

5. A paved blacktop parking lot was built on what was once a soil-covered field. This area will now experience increased runoff when rain occurs because the paved parking lot has
   a. less capillarity
   b. greater infiltration
   c. less permeability
   d. greater porosity

6. Compared to an area with gentle slopes, an area with steeper slopes most likely has
   a. less infiltration and more runoff
   b. less infiltration and less runoff
   c. more infiltration and more runoff
   d. more infiltration and less runoff

Base your answers to questions 7 through 8 on the diagram below, which shows two identical containers filled with uniform particles that were sorted by size.

7. Which characteristic is most likely the same for these particle-filled containers?
   a. infiltration rate
   b. water retention
   c. capillarity
   d. porosity

8. Water will be able to infiltrate each of these sediment samples if the sediment is?
   a. saturated and impermeable
   b. saturated and permeable
   c. unsaturated and impermeable
   d. unsaturated and permeable
PART II QUESTIONS: FREE RESPONSE

Base your answers to questions 9 through 11 on the diagram below that represents a portion of a stream and its surrounding bedrock. The arrows represent the movement of water molecules by the processes of the water cycle. The water table is indicated by a dashed line. Letter A represents a water cycle process. Letter d represents the distance between the water table and the land surface.

9. Identify water cycle process A, which produces cloud droplets.

10. Describe the permeability, porosity and slope that allow the most infiltration of rainwater.

11. Explain why the distance, d, would decrease after several days of heavy rainfall.
Directions: Complete the following statement by filling in the blank with “increase” or “decreases”.

12. As porosity increases, infiltration will ______________________________.

13. As particle size decrease, capillarity will ______________________________.

14. As precipitation increases, infiltration will ______________________________.

15. As porosity decreases, infiltration will ______________________________.

16. As porosity increases, permeability will ______________________________.

17. As infiltration increases, runoff will ______________________________.

18. As slope of the land increases, runoff will ______________________________.

19. As slope of the land decreases, infiltration will ______________________________.

20. As the degree of saturation decreases, infiltration will ______________________________.

21. As the degree of saturation increases, runoff will ______________________________.

22. As precipitation decreases, runoff will ______________________________.

23. As porosity decreases, runoff will ______________________________.

24. As permeability increase, infiltration will ______________________________.

25. As particle size increases, infiltration will ______________________________.