# Sci103- science and technology course_ phase 3_ip3 - lab report example

Science, Biology

# SCI103- Science and Technology Course_ PHASE 3_IP3

Assignment: SCI103 Phase 3 Lab Report Soil Infiltration and Runoff

Instructions: Enter the Virtual Lab and gather the information needed to complete the report from the field. Please type your answers on this form. When your lab report is complete, submit it to the Submitted Assignments area of the Virtual Classroom.

Part I: Field Research

Section 1: Gather the following information from field research while in the Phase 3 lab environment. Notice that each site you visit has a distinctly different surface, which could affect runoff.

One Inch of Rainfall

Shallow water infiltration

Deep water infiltration

Runoff water

Evaporation water

Vegetation

25%

25%

10%

40%

Mountain

10%

5%

60%

25%

Bare soil

20%

15%

35%

30%

Section 2: Now you will look at how many gallons of water end up as infiltration, runoff or evaporation after one inch of rainfall. One inch of rainfall deposits 144 cubic inches or 0. 623 gallons of water per square foot of surface area. Use the following formula to calculate the amount of water after one inch of rainfall (in gallons) for each section:

0. 623 gal/ square foot x (square feet of surface area) x (% from table 1*) = gallons rain water

*Remember to convert percentages to decimals prior to doing the above calculation. For example: 40% is written as 0. 40 in this equation.

One Inch of Rainfall

Shallow water infiltration (gallons)

Deep water infiltration

(gallons)

Runoff water

(gallons)

Evaporation water

(gallons)

Vegetation

15. 575

15. 575

6. 23

24. 92

Mountain

24. 92

3. 115

37. 38

15. 575

Bare soil

12. 46

9. 345

21. 805

18. 69

Part II: For the following questions, provide your response in short-answer format (2–3 sentences each). Use this Phase's activities and resources to assist you in answering.

1. How does the vegetation surface type affect the amount of runoff? Speculate why this happens.

Vegetation surface type reduces the amount of runoff because vegetation provides little if any impervious surface area. Consequently, light rainfall produces very little or no runoff (Factors affecting runoff, n. d.).

2. How does the smooth mountain rock surface affect the amount of runoff? Speculate why this happens.

Smooth mountain rock surface increases the amount of runoff because there is inadequate vegetation cover to reduce the amount of exposed surface. In addition, the terrain of the area makes it prone to runoff because the steep

sloping increases the downward flow of water thereby increasing the quantity of soil that is taken away with the water (Yong, Mulligan, & Fukue, 2006).

3. How does the bare soil surface type affect the amount of runoff? Speculate why this happens.

Bare soil surface type increases the amount of runoff more than vegetation surface type, but less than smooth mountain rock surface. This observation can be attributed to the lack of vegetation cover on the bare soil, which exposes the oil to runoff. However, the absence of a steep slope somehow slows down the rate of movement of water carrying soil thereby making the rate of runoff less than that on a mountainous terrain (Perlman, 2012).

4. How does vegetation slow and prevent sediment loss?

Vegetation slows down and prevents the loss of sediment by enabling the soil to be compacted to the ground. Consequently, the possibility of sediment being carried away by running water is reduced significantly.

5. How does vegetation allow greater infiltration?

Vegetation slows down the speed of water movement over the surface of the ground. Therefore, rainwater has more time to be in contact with the ground leading to more absorption of water hence greater infiltration (Beven, 2012).

6. How does pavement or smooth rock runoff affect waterways?

Pavement or smooth rock runoffs affect waterways by on causing downstream flooding since a lot of water is carried to the waterways. There is little soil on such surfaces hence no obstruction of waterways.

7. How do heavy sediment deposits affect waterways?

Heavy sediment deposits affect waterways by congesting them and

obstructing the movement of water. Additionally, there is pollution of waterways when the sediments contain noxious substances such as nitrogenous fertilizers from agricultural farms. Therefore, heavy sediment deposits pollute waterways.

8. How does sediment loss affect land and soil quality?

Sediment loss affects land and soil quality by reducing the fertility of the land. There is loss of rich humus soil as well as important minerals, which causes the land to be unproductive.

References

Beven, K. J. (2012). Rainfall-runoff modelling: The primer (2nd ed.). Hoboken, NJ: John Wiley & Sons.

Factors affecting runoff. (n. d.) Retrieved from http://www. waterencyclopedia. com/Re-St/Runoff-Factors-Affecting. html

Perlman, H. (2012). Surface runoff: The water cycle. Retrieved from http://water. usgs. gov/edu/watercyclerunoff. html

Yong, R. N., Mulligan, C. N. & Fukue, M. (2006). Geoenvironmental Sustainability. Boca Raton: CRC Press.