Soaking in Infiltration

Environmental Architect

Site Analysis, Material Behavior

Infiltration describes the process by which rainfall and storm water runoff is captured and absorbed into the ground and enters subsurface soil or rock. In this activity, you'll soak in the concept of infiltration by exploring how rainfall is absorbed into impermeable and permeable surfaces.

1. As directed, pour 200 mL of water into your aluminum tray setup and allow the water to run off into the collection cup for one minute. Upon your observations, answer the following:

   - How much "runoff" was produced by this setup? _____ mL
   - How much water was absorbed by this setup? _____ mL
   - Is this set-up a good example of infiltration? Explain your reasoning.

     ❑ Yes, this is a good example of infiltration

     ❑ No, this is not a good example of infiltration

     _____

     _____

2. After removing some of the sponges from the plastic bag as directed and pouring another 200 mL of water into the tray, respond to the following:

   - How much "runoff" was produced by this setup? _____ mL
   - How much water was absorbed by this setup? _____ mL
   - Is this set-up a good example of infiltration? Explain your reasoning.

     ❑ Yes, this is a good example of infiltration

     ❑ No, this is not a good example of infiltration

     _____

     _____

A Media Investigation

Environmental Architect

Hydrologic Testing, Design Optimization

The media used in BMPs often determines their infiltration rate, or the speed at which water is absorbed into the ground. As the lead landscape architects on a new green stormwater infrastructure project, your team must conduct tests to determine which media is the best to use to maximize the infiltration rate of the features on your site.

1. Using your knowledge of the relationship between infiltration, pore space, and media coarseness, feel the texture of the different media to hypothesize which will have the highest and lowest infiltration rates.

   _____
   _____
   _____

2. Put your hypothesis to the test!

   a. Mark 1-inch increments on the outside of a perforated 1-quart deli container and add 2 cups of media.
   b. Pour water through until it drains fully to saturate the media, which will allow your tests to mimic the media's minimum infiltration rate during a rain event.
   c. Pour in 2 cups of water and time how long (in seconds) it takes to drop a measured number of inches.

Media Type	Inches of Infiltration	Infiltration Time (in seconds)

3. Calculate the infiltration rate of each type of media by dividing the inches of water infiltrated by the infiltration time.

Media Type	Infiltration Rate (Inches/Second)

4. Reflect on your results. Did the results of this activity support or refute your hypothesis? What factors or characteristics of the media may have contributed to their resulting infiltration rate?

   _____
   _____
   _____
   _____

To BMP, or not to BMP

Environmental Architect

Site Prioritization, Solution Mapping, Impact Assessment

It's time to put your landscape architecture skills to the test!

Your team is in charge of creating a landscape design plan that transforms the Mock Site into a storm water-friendly green space for the community. Your lead architect has identified three priority locations on the Mock Site GSI Map:

1. Southside parking lot
2. Front of the admin building
3. Hillside lawn

Instructions:

1. Review the *Location Suitability* section on the BMP Cards to find designs that fit each area's space and conditions.
2. Select two candidate BMPs per site and fill in the evaluation table using the *Performance Matrix Scores* on each card.
3. Calculate total matrix scores, compare the pollutant load and volume reductions, and make your final decision on which BMP to install at each site.

SITE 1 Issue: Parking lot runoff with high levels of suspended solids, including sediment, and oil.

BMP Solution(s)	Effectiveness	Ease of Installation	Ease of Maintenance	Cost	**TOTAL**

SITE 2 Issue: Roof runoff into an area of ponding with a moderate amount of nutrients and sediment.

BMP Solution(s)	Effectiveness	Ease of Installation	Ease of Maintenance	Cost	**TOTAL**

SITE 3 Issue: High volume of water, severe soil erosion, and heavy nutrient loading.

BMP Solution(s)	Effectiveness	Ease of Installation	Ease of Maintenance	Cost	**TOTAL**