



Green Classroom



Soak In/Runoff Model

Concept

Surface runoff vs. infiltration in an urban watershed and its effects on water quality.

Objective - Students will:

- 1) identify four common land uses found in a city watershed: streets, lawns, gardens, and construction sites;
- 2) recognize the positive effects of infiltration on water quality;
- 3) recognize land uses where chemicals could be present;
- 4) hypothesize the water quality of groundwater and surface runoff for each type of land use based on prior knowledge;
- 5) evaluate results and personal choices for water quality.

Time 20 minutes

Materials: Provided at the Green Classroom

- "Soak In and Run Off model
- 4 student watering cans
- red food coloring
- 8 empty jars to catch runoff and groundwater for each land type.

GREEN CLASSROOM LESSON **Soak In / Runoff Model**

Introduction : The Bouldin Creek watershed is a city watershed. There are many streets, homes, lawns and gardens, and some construction in the area that drains to Bouldin Creek. These four land uses are represented in the Soak In/Runoff Model. In this experiment, you will discover how the creek is affected by each kind of land use.

Procedure

1. What's better – Water soaking in or running off?

In a preserved watershed, soil and plants act as a filter for pollutants. In a preserved watershed, 90% of the rainfall soaks in. The water that has soaked in to the ground slowly moves through the soil and into a creek, allowing for filtration to take place.

2. Forming a Hypothesis

Which land use in the model best imitates a natural watershed?

- Native Yard: There is a lot of soaking in and filtration in native gardens.
Are lawn chemicals used on a native lawn or garden?(no)
- St. Augustine Lawn: Could provide filtration from soil and plants. However, chemicals are often put on this type of lawn to get it to grow in Austin's dry rocky soil? (fertilizers and weed killers) Put red food coloring on the lawn to represent these chemicals.
Do you think the soil and grass will filter all the chemicals just put on the lawn? (any reasonable answer)
- Street: Will any water soak into the street? (no) Is there any filtration for the runoff? (no)
Are there harmful chemicals on the road? (yes) What are they? (oil, gas, etc.)
Put red food coloring on the street to represent these chemicals.
- Construction Site: Have you seen any construction going on in Austin? (yes, everywhere)
Is the construction site a natural filter? (no, it has soil but no vegetation)
What could be carried with the rainwater running over bare soil? (dirt)

3. Testing the Hypothesis

- Ask four students to use a watering can to water each of the four different types of land.
- Refill the watering cans and do a second watering or however many it takes for all students to get a turn.

4. Discuss the Results

- Sample Questions: Which water sample is the most polluted? (Street and lawn have chemicals in the form of red food coloring. Construction site has muddy water.)
Which land use had the most surface runoff? (The street: lots of streets and buildings can cause flooding because it prevents soaking in.)
Which land use had the cleanest water sample? (Native vegetation: the water has a tea color from organic materials, but it is clear.)

5. Conclusions

Changing the land use in your own yard can improve water quality. You can choose native plants, use compost instead of fertilizer on non-native yards, pull weeds and identify bugs.