Recall your vocabulary from lesson 1:

- Pervious surface - surface where water can infiltrate such as soil
- Impervious surface - surface where water cannot infiltrate such as concrete
- Precipitation = Evapotranspiration + Infiltration + Runoff

Runoff and Infiltration Experiment

Materials:

- 4 cut water bottles (river channel) → 1 soil, 1 sand, 1 impervious concrete, 1 pervious concrete
- 8 cups (4 for groundwater, 4 for runoff collection)
- aluminum foil
- Small rocks as stoppers
- 4 aluminum pans
- 1 soil disposal bucket
- Timer
- Ruler
- Week 3 Runoff Experiment sheet

For this experiment you will be exploring the ways in which water flows through different landscapes in groups of 3-4. You will work in your team to measure how much water is:

1. Being drained into groundwater,
2. Being left as runoff
3. Absorbed by the surface

This will allow you to observe and measure the differences between natural and urban environments. At the end, you will determine best management practices based on the results of your experiment.

Procedure:
Assign each person in your team a task. You will need a person to hold the water bottle and pour the water, one person to measure your results, and one person to keep track of time, and an observer/data recorder.

There will be four stations with a bottle apparatus that demonstrate various types of river landscapes you can encounter:

  - Pervious w/ soil
  - Pervious w/sand
  - Impervious ‘concrete’
  - Pervious ‘concrete’

- Fill the cup up to the 8 cm line and pour slowly into the water bottle and observe
- **After 1 minute, cap your water bottle. FOR IMPERVIOUS CONCRETE, start with a capped water bottle.**
- Measure the amount of ‘groundwater’ collected after 1 minute.
- Measure the amount of runoff (undrained top layer) collected after 1 minute.
- Subtract the groundwater and runoff from the volume of the water bottle to calculate the amount of water retained in soil
- Record your results in your table.

Precipitation - Groundwater Infiltration - Runoff = Soil Retention

(Since there are no plants or time for evaporation in our experiment, there is no ET)
Before you begin, discuss in your groups and make a hypothesis about:

1. Which bottle will result in the most runoff collection (drain slowest)? Why?

2. Which bottle will result in the most groundwater collection (drain fastest)? Why?

3. Which bottle will result in the most water retained in the soil (absorbed fast, but drain slow)? Why?

Test results:

Total: 8 cm	Groundwater (cm)	Runoff (cm)	Soil Retention (cm)
Pervious soil			
Pervious sand			
Impervious ‘concrete’			
Pervious ‘concrete’			

After testing your hypotheses, what were your results?

4. Which bottle resulted in the most runoff collection (drain slowest)?

5. Which bottle resulted in the most groundwater collection (drain fastest)?

6. Which bottle resulted in the most water retained in the soil (absorbed fast, but drain slow)?