

Name \_\_\_\_\_

Date \_\_\_\_\_

## Permeability of Soils

**Problem:** To find out which substrate is the most permeable to water, and how permeability affects water quality.

**Hypothesis:**

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**Materials:**

Plastic funnel

Plastic wrap

Beakers

Coffee filter or gauze

substrates: soil, clay, sand, pebbles

water

graduated cylinder

Stopwatch

**Procedure:**

1. Make observations about the substrates you will test. Write down your observations.
2. Get a plastic funnel, and place the gauze or coffee filter inside the funnel.
3. Measure 200 mL of the first substrate you will test into the funnel.
4. Place the funnel over a beaker. One person should hold the funnel.
5. Measure out 100 mL of water.
6. Slowly pour 100 mL of water onto the substrate, making sure not to let the water overflow the funnel. Start timing when the water touches the surface of the substrate, and stop timing when the water stops dripping through the funnel or after five minutes.
7. Calculate the volume of water in the beaker after five minutes.
8. Cover the last substrate you tested with plastic wrap. Do not pull it tight, but lay it on top of the soil sample inside of the funnel. Pour the same amount of water onto the sample, and wait five minutes to see what will happen.
9. Complete the trial again with only the gauze or coffee filter. This is your control.
10. Write down all of your results and compare with your classmates.

**Results:**

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**Discussion:**

1. Through which material did the water move the fastest? The slowest? Why?
2. Why is the permeability of the substrates different?
3. What can you say about the permeability of the plastic wrap? What type of surface does this mimic in real life?
4. Which substrate would cause the least flooding for a community? Why?
5. What does this graph tell you about the relationship between permeability and stream health?

