

 **Activity 3.4.2 On Your Mark, Get Set, FLOW!****Purpose**

Soil permeability is critical to understanding how water and soil interact. Soil permeability depends on the presence of pores that help water filter through the soil profile. If soils lack pores, or porosity, water moves through it very slowly, if at all. Slow movement of water through a soil caused by poor internal drainage can increase surface erosion.

Soil texture is a major contributor to permeability. Use your investigative skills to measure the rate of water movement through different types of soil particles and determine how soil texture and soil permeability are interdependent.

**Materials****Per pair of students:**

- Water
- Pea gravel
- Coarse river sand
- Potting soil
- Hand magnifying glass
- Profile tube
- Profile tube cap
- 30 ml graduated cup
- 100 ml graduated cylinder
- Stop watch
- Computer with spreadsheet and printing capabilities

**Per student:**

- Pencil
- *Agriscience Notebook*

**Procedure**

You will work with a partner to complete this activity. You will place one of the three test samples in a profile tube, add water, and record the time it takes for the water to filter through the sample. The comparison of soil samples for water permeability rates will be illustrated using a graph.

**Part One – Conduct Permeability Tests**

1. Use the graduated cup to add 30 ml of pea gravel to a profile tube.
2. Use the magnifier and examine the physical appearance of the gravel. Record observations, especially details related to pore space in Table 1.
3. Fill the graduated cylinder with 100 ml of water.
4. One partner will place their finger over the hole in the profile tube while the other partner pours 100 ml of water into the profile tube.
5. Position the graduated cylinder under the profile tube so the water will drain from the tube into the cylinder and prepare the stopwatch for timing.
6. Remove your finger from the bottom of the profile tube and start the stopwatch in order to time how quickly the water filters through the soil sample.
7. Once most of the water has drained from the profile tube and the drips have stopped record the time it took to drain in Table 1.

