Soil Percolation Lab

Name: _____ Date: _____ Period: _____

LT1: I can investigate percolation and how it effects the water cycle.
LT2: I can revise my model of the water cycle to include what I have learned.

Background Information:

Much of the rain that falls on land soaks into the ground. The rest runs off into streams and rivers. The downward entry of water into the soil or rock surface is called **infiltration**. **Percolation** is the flow of water through the soil and spongy or cracked rock. How well rain infiltrates and percolates into the ground depends on many factors including: the slope of the land, the amount of space between the particles of soil and the ability of the soil's capability to allow water to pass through it (called **permeability**). This water, that continues downward through the soil will eventually reach rock material that is full of water. The water moves slowly and may eventually discharge into streams, lakes, and oceans.

The time that it takes for the water to move through soil is called its **percolation rate**. In this activity you will test the rate that water moves through two different types of soil components – topsoil and sand.

Pre-lab check-in: Define the following terms.

1. Infiltration: _____
   _____
2. Percolation: _____
   _____
3. Permeability: _____
   _____
4. Percolation rate: _____
   _____

Testable Question: Does the soil component (topsoil or sand) affect how fast water flows through it?

Definition of Variables:

IV: _____ DV: _____

CVs: _____

Hypothesis: Do you think that the percolation rate will be faster in top soil or sand? Why?

_____

_____

_____

Materials:

Topsoil	Sand	Water
Timer	Plastic Cup (10 oz.)	2 - Paper Cups (3 oz.) Plastic Cup (16 oz.)
Funnel	2 - Coffee Filters	50mL Graduated Cylinder

Procedure:

1. Gather materials.
2. Fill 10 oz. plastic cup (smaller cup) ¾ full with water.
3. Fill one paper cup with sand and the other with topsoil.
4. Line the funnel with one coffee filter and place in the 16 oz. cup.
5. Pour the topsoil sample in the coffee filter.
6. Measure 50 mL of water in the graduated cylinder.
7. With one group member ready to start the time, pour the 50mL water through the sample. Start the timer simultaneously.
8. When 30 sec. has passed, measure the amount of water collected in the 16 oz. cup by pouring it back into the graduated cylinder and record the volume in the data table.
9. Dump the sample into the appropriate used sample bucket at the front of the classroom.
10. Repeat steps 4 – 9 with the sand sample.

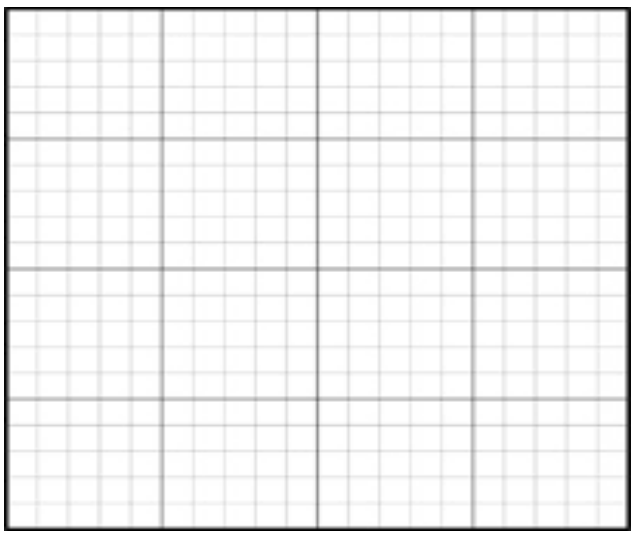
Observations and Data Analysis:

Data Table

Sample	Water Volume (from step 8) in mL	mL/sec.	Percolation Rate (mL/sec)
Topsoil		____ ÷ 30	
Sand		____ ÷ 30	

Graph:

1. What type of graph will you use to display your data? _____
2. Graph your data. *(Remember TAILS)*



Conclusions:

1. Was your hypothesis supported or refuted? _____
2. Which soil component had the fastest percolation rate? _____
3. What properties or characteristics does that component have that might contribute to the percolation rate?

   _____

   _____

   _____
4. Which soil component had the slowest percolation rate? _____
5. What properties or characteristics does that component have that might contribute to the slower percolation rate?

   _____

   _____

   _____
6. How do you think that soil with a slower percolation rate would affect the water cycle? (Hint: Think about what it would mean to the cycle if the water would be caught in the soil longer.)

   _____

   _____

   _____

   _____

   _____
7. What part do infiltration and percolation play in the water cycle?

   _____

   _____

   _____

   _____

   _____
8. Modify your water cycle model to include infiltration/percolation if you do not yet have them listed.