**Soil Erosion Lab**

**Objective:** To determine how different ground covers affect the rates of water erosion

**Background:** Soil is “the unconsolidated cover of the earth, made up of mineral and organic components, water and air and capable of supporting plant growth.” Certainly, our survival depends on our capacity to produce enough crops to feed the increasing population on the earth. And to do that, we need to maintain our soils. However, there are many problems affecting the soil. One of the most important is soil erosion which “is the process of detaching and removing soil materials from their original sites.” Erosion is caused mostly by natural factors such as flood water, wind, and volcano eruptions among others. But soil erosion can also be caused, or at least increased, by human activities such as deforestation, overgrazing, and road or trail building. While some amount of erosion is natural and, in fact, healthy for the dynamic process of life on earth, too much erosion can reduce soil fertility, pollute water bodies and create other problems. This lab aims to explore how different ground covers can work to prevent erosion and improve water quality.

**Materials:**

* 4 1-liter bottles cut in half
* Enough soil to cover the bottoms of the bottles
* 100 ml beaker
* 100 ml graduated cylinder
* 4 cups
* String
* timer
* 3 types of ground cover (options include: gravel, hay, grass clippings, mulch, leaf litter, moss)

**Procedure**

1. Obtain 4 bottles and fill them about half way with soil. **Do not pack down!**

2. Place you different ground covers in three of the bottles. Leave the 4th bottle bare.

3. Place the bottoms of the bottles on a stack of textbooks so that the bottles are at a slight incline.

4. Poke holes in the sides of the cups and attach string so that they may hang off the end of the bottle. *See example at the front of the class if needed.* Hang the cups from the bottles.

5. From sink, pour 50 ml (or 100ml) of water in beaker. Starting at the raised end of one bottle slowly pour the water into the soil. Start timing as soon as you start pouring!

6. Let water run through the entire bottle. Stop timer when water stops dripping into the cup. Record amount of time water took to run through the bottle in the data table.

7. Make observations of the runoff water in the data table including color, clarity, and approximate amount of sediment in it.

8. Pour the water from the cup into a graduated cylinder and measure how much water made it through the bottle. Record results in the data table.

9. Dispose of all soil in the garbage, rinse all materials in the sink, and clean up station.

10. Answer analysis questions.

**Hypothesis (***what type of ground cover will prevent erosion best and why?)***:**

**Data Table**

|  |  |  |  |
| --- | --- | --- | --- |
| **Ground Cover** | **Time for water to stop flowing (sec)** | **Amount of water collected (mL)** | **Qualitative Observations** |
| **Bare** |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

**Analysis Questions**

1. Did you data support your hypothesis? Why or why not?

2. Compare your results with one other group who used different ground covers than you. How do your results compare?

3. What do your results suggest about the different types of ground cover and how they work to prevent erosion? What recommendations would you make to help prevent erosion?