WATERSHED EROSION

INTRODUCTION

When rain falls on the ground, some of it will form streams. Those streams will flow downhill. Some rain forms layers of water that move downhill. Together, these things are called **runoff**. Runoff is one way rivers and lakes get their water. The large area that lets water flow into a river or lake is called the **watershed**. We need to protect and manage our watersheds to keep our rivers and lakes healthy. One way to protect watershed is to keep soil in place and not let it wash into the river. In this activity, you will investigate one way that soil can be kept in place in a watershed.

OBJECTIVES - - Upon completion of this activity, the student should be able to . . .

1. Describe the effects of water runoff on bare soil in a watershed
2. Describe the effects of water runoff on vegetated soil in a watershed

STATE STANDARDS ADDRESSED

11A.1a -- Describe an observed event
11A.1d -- Record and store data using available technologies
11A.2d -- Use data to produce reasonable explanations
12E.2b -- Describe and explain short term and long-term interactions of the earth's components (e.g. earthquakes, types of erosion)

MATERIALS NEEDED*

1 tray with soil only**
1 tray that is empty
1 tray with soil, sand, and grass (optional)
water source
1 tray with sod (soil and grass)**
1 tray with soil mixed with sand
1 plastic pitcher
paper towels

* The trays can be similar to the black trays seed starter kits come in from garden stores, or may be cake pans, or even shallow dish pans. The sides must be short enough to allow water to run off the trays and into a catch pan or catch tray.

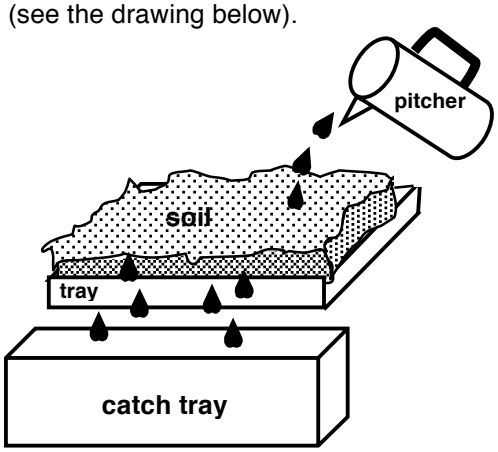
** Ahead of time, the teacher should prepare three trays: one tray with a layer of plain about 1 inch (2.5 cm) thick, a second tray prepared with sod of the same thickness (sod is soil with grass growing in it), and a third with a one-inch layer of soil mixed with sand. A fourth tray may be made with soil-sand and grass. The teacher may want to have students grow their own grass in the trays, but this should be started weeks before this activity is conducted. These trays need a "good stand" of grass in them for this activity to be effective.

PROCEDURES

A. Get the pitcher and fill it half full with water.

B. Get the tray with plan soil on it.

C. Hold the tray so the long side is up (see the drawing below).



D. Hold the tray so its lower edge is above the empty tray.

E. Hold the tray so it is sloped (not straight up and down).

F. Gently pour water from the pitcher onto the soil. Move the pitcher slowly from side to side so water falls on all the soil.

G. Let the water run off and fall into the empty tray. This is the ***runoff water***.

H. Observe what happens to the soil on the sloped tray. Write down what you see. Write it in the Data Table on the next page.

I. Observe the water that fills the empty tray. Write down what you see. Write down things about how clean or dirty it is. Write your observations in the Data Table.

J. Repeat everything you just did, but this time use the tray with the soil and sand mix. Be sure to write down things you observe. Write them in the Data Table.

K. Again, repeat everything you did, but use the tray with the soil and grass. Be sure to write down things you observe. Write them in the Data Table.

Data Table

TRAY USED	WHAT I OBSERVED
Soil Only	
Soil and Sand Mix	
Soil and Grass	

QUESTIONS (Note: The teacher should put these on a separate page with ample space for students to write down their answers.)

1. Compare the ***runoff water*** from the "soil only" tray and the "soil and sand" tray. Which tray gave the most dirty water?
2. Which of the three trays had the cleanest ***runoff water***?
3. Which tray lost the most soil: the plain soil, the soil and sand mix, or the soil and grass?
4. Look closely at the soil tray, then look closely at the tray with grass. Which one kept its soil best?
5. Imagine you are a city builder. When you build a house or a building, would you want to leave the soil around it bare, or plant grass? Tell why you think so.
6. Do you think trees on a hill in the woods would help soil the same way grass helps soil stay in place? Tell why you think so.
7. A very large area of the earth that slopes down to a stream or a lake is called a ***watershed***. What is one thing we can do to keep the ***watershed*** from washing away?
8. What do you think will happen to a river or a lake if its ***watershed*** is not protected from soil washing away?