Name_____

CASE

Activity 4.1.3 Moving Earth

Purpose

How long has the soil you stand on been here? The answer will vary depending upon the causes of soil formation, such as rainfall. Rainfall is considered a climate soil formation factor, and is attributed to the most recently developed soil profiles in terms of geological time.

Rainfall has a good and bad side, as you will discover. It is good in the sense of depositing soils in lowlands, such as valleys, to form very deep and productive soils. However, in this process, the material being deposited had to come from another location. The removal of soil due to water is called erosion. Erosion is typically considered a detrimental effect of poor soil management and could destroy the soil quality of an area.

The soil or sediment moved by rainfall is moved with the flow of water. When soil is removed from the surface due to rainfall and erosion, the process is called reduction. When soil is deposited due to erosion, it is referred to as an addition. How does rainfall influence the formation of soil?

Materials

Per group of four students:

- Stream bed
- Catch basin
- Stand
- Rainmaker
- Stream sand
- 30ml graduated cup
- Plastic spoon
- 9-oz plastic cup
- Water
- Paper towels

Per student:

- Pencil
- *Agriscience Notebook*

Procedure

You and your group will use a model to simulate the effects of rainfall on soil. Record observations during the experiment to understand how geological formations developed as a result of soil movement.

1. Cover your work area with paper towels.
2. Set up your stream bed as shown in Figure 1.
3. Place three 30 ml cups of dampened stream sand in the middle of the stream bed.

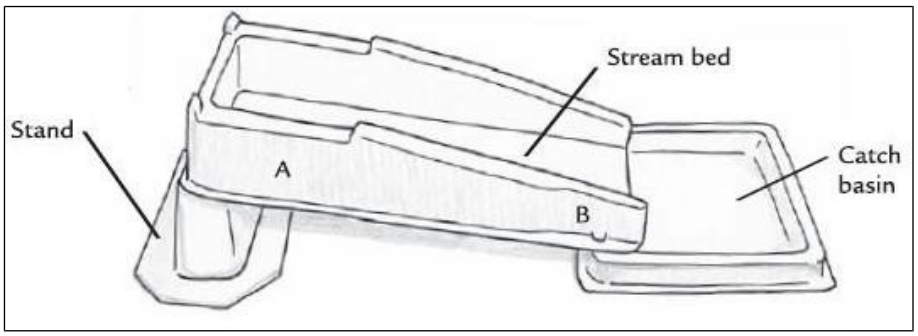

Figure 1. Stream Bed Setup

4. Use the spoon or your fingers to pack the sand into an even layer that covers the stream bed from point A to point B.
5. Place the Rainmaker over point A as shown in Figure 2.
6. Add one 30ml cup of water to the Rainmaker and observe. On Table 1 of *Activity 4.1.3 Student Worksheet*, sketch the patterns produced by the water from Point A to Point B.

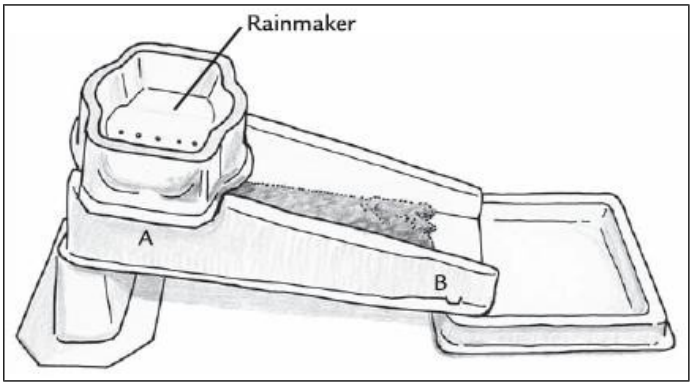

Figure 2. Placing the Rainmaker

7. Add a second 30ml cup of water to the Rainmaker and observe. On Table 2 of the student worksheet, sketch the patterns produced by the water from Point A to Point B.
8. Add a third 30ml cup of water to the Rainmaker and observe. On Table 3 of the student worksheet, sketch the patterns produced by the water from Point A to Point B.
9. Answer the analysis questions on the student worksheet.
10. Clean up your work area as instructed by your teacher.

Conclusion

1. Explain why it is important for agriculturalists to understand and determine where additions and reductions of soil are occurring in today's topography.

2. Discuss why it is important to understand and determine where additions and reductions of soil have occurred in the past.

Source: Lab-Aids Incorporated. (2001). *Modeling stream erosion and deposition* [Brochure]. Ronkonkoma, NY: Author.

Name_____

Activity 4.1.3 Student Worksheet

Table 1. ***30 ml of Water***

Point A	Point B

Table 2. ***Second 30 ml of Water***

Point A	Point B

Table 3. ***Third 30 ml of Water***

Point A	Point B

Analysis Questions

- Describe the major changes that occurred each time 30ml of rain fell on the streambed.

- Where did the greatest amount of reduction occur? Based on your observations, explain why reduction takes place in this location.

- Where did the greatest amount of addition occur? Based on your observations, explain why addition takes place in this location.

- What would happen to the reduction and addition if Point A was raised higher? Why?