

Activity 3.3.3 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 create 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. This activity examines the influence rainfall has on the formation of soil.

Materials**Per group of four students:**

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

Per student:

- Pencil
- *Agriscience Notebook*

Procedure

You and your partners will use a model to simulate the effects of rainfall on soil. You will record observations during the experiment to gain an understanding of geological formations that are developed as a result of soil movement.

1. Cover your work area with paper towels.
2. Set up your Stream Table as shown in Figure 1.
3. Place three 30 ml cups of dampened Stream Sand in the middle of the streambed.

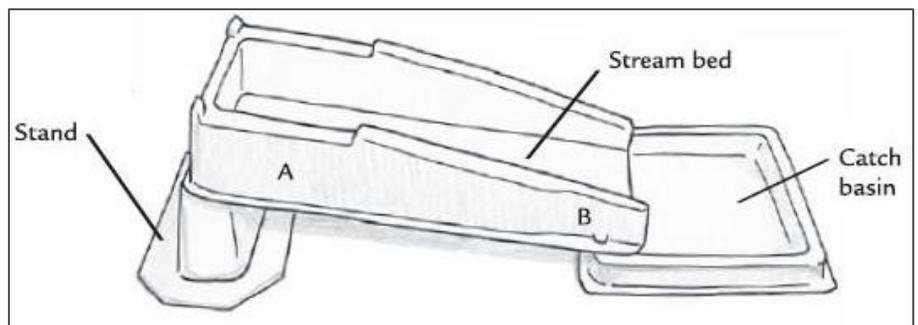


Figure 1. Stream Table Setup

4. Use the spoon or your fingers to pack the sand into an even layer that covers the streambed from point A to point B.
5. Place the Rainmaker over point A as shown in Figure 2.
6. Add one 30 ml cup of water to the Rainmaker and observe. Use the space below to sketch the patterns produced by the water from Point A to Point B.

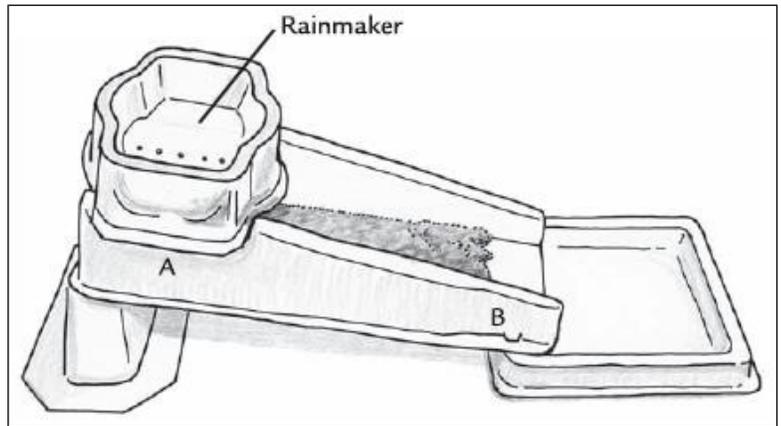


Figure 2. Placing the Rainmaker

Point A

Point B

The water covered almost all of the sand, but the sand stayed in place. The water traveled extremely slow throughout the sand.

7. Add another 30 ml cup of water to the Rainmaker and observe. Use the space below to sketch the patterns produced by the water from Point A to Point B.

Point A

Point B

With the second cup of water, the water traveled a lot quicker throughout the sand than in the first one. It went straight to the end, and some of the water and sand went into the bottom

8. Add a third 30 ml cup of water to the Rainmaker and observe. Use the space below to sketch the patterns produced by the water from Point A to Point B.

Point A

Point B

The water traveled a lot quicker throughout the sand, and some more of the sand and water went into the reservoir. As a whole formed in the middle of the sand at the top of the container thing.

9. Clean up your work area as instructed by your teacher.

Conclusion

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

The sand got thinner, and the water traveled faster and faster.

2. Where did the greatest amount of reduction occur? Based on your observations, explain why reduction takes place in this location. The greatest amount of reduction occurred in the top of the sand straight down. Because that's where the water is being put in at directly.
3. Where did the greatest amount of addition occur? Based on your observations, explain why addition takes place in this location. The greatest amount of addition occurred on the sides because when the water came down the middle it pushed the sand outwards.
4. Explain why it is important for agriculturalists to understand and determine where additions and reductions of soil are occurring in today's topography. It is important because of landslides. Also because erosion may occur and buildings and other things will slowly erode away. Also it's very important for planting crops, because you don't want to lose your good soil, and your plants won't grow as nicely as they would with the good soil.
5. Explain why it is important to understand and determine where additions and reductions of soil have occurred in the past. It is important because you need to know where the soil has been lost or added, also because erosion causes a lot of problems with the availability and quality of the water.

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