



Wandering Water

OVERVIEW:

This lesson will help students understand that water can move soil and other materials. Soil erosion occurs over time. If not checked, it can shorten the life span of dams and reservoirs, clog navigation channels, and affect the quantity and quality of water delivered to towns and cities.

Failing to contain and properly recapture water into the water cycle can reduce our supply of usable water. Water usually travels around objects in its path and follows the path of least resistance. Obstacles and obstructions that water cannot dissolve or move create the courses of rivers and streams.

What happens to these paths when there is little or no rain? There are conservation and protection methods that should be used to ensure that the natural paths of the water supply are protected and safe.

KEY VOCABULARY:

To **displace** is to move physically out of position. For example, a floating object displaces water and soil erosion displaces water from a river.

Erosion is the wearing-down or washing away of the soil and land surface by the action of water, wind, or ice.

Ground water is the water below the Earth's surface that fills all the pore spaces between soil particles or cracks and crevices in the rocks. Areas with large amounts of ground water are called aquifers. Ground water, wetlands, and surface water are all connected. In low areas, ground water may move into the open water areas and again become part of surface runoff in rivers and streams.

An **obstacle** is something that impedes progress or achievement. An example is an object that gets in the path of flowing water, stopping its movement.

Runoff is the water that forms streams and rivers. The amount of runoff depends on the area of the watershed, how much it rains or snows, and whether the ground is steep and rocky or sloping and porous. Wetlands (marshes, swamps, and bogs) absorb large amounts of runoff and slow down the rate of flow. These areas also release water for a long time after a rainstorm, helping to keep rivers flowing in times of drought.

MATERIALS:

- Paper cups
- Paper towels
- Metal (tin) roasting pan
- Soil
- Plastic tray
- 1-gallon plastic jug filled with tap water

PROCEDURE:

1. Spread a thin layer of soil over the plastic tray.
2. Have students press down on the soil to compress it, keeping it within the tray.
3. Lay the plastic tray with one short end in the tin roasting pan and the other end sticking out. This will allow the pan to act as a basin for any water running off the tray.
4. Take a cup filled with water and have one student gently pour the water in one spot at the top of the plastic tray (the end NOT laying in the tin pan).
5. Discuss the process that you observe happening (erosion, underground water, changes in soil, etc.).
6. Have students place one rock (an obstacle) in the original path of the water and one rock around the original path.
7. Have a student pour a cup of water in the same spot and at the same speed as before.
8. Discuss the change in the path. How did the obstacles change the path and what happened to the erosion?
9. Change the quantity of water poured in the same spot as the first two cups. The water will have more power because its volume is greater.
10. Observe the erosion occurring. Discuss how fast runoff affects land and rivers.
11. Have one student hold up the end of the plastic tray that is sticking out about 2 inches above the tin pan. Pour a fourth cup of water and observe the intensity with which the erosion and runoff occurs. The water will have more power because it is traveling at a greater speed and the angle is greater.
12. Discuss the angle of the land changing and the force of the water changing the amount of erosion that is occurring. If riverbanks erode, does rain and runoff move faster or slower into the river?
13. Pour a last cup of water while a student continues to hold the plastic tray above the tin pan. Allow the water quantity to increase so that the angle and volume both affect the strength of the runoff and the amount of erosion.
14. Discuss what happens to the aquatic life in a river with erosion and fast runoff. What life is affected by aquatic life dying? (Answer: The bug population grows, small animals need to migrate to find food, food sources for humans are diminished, etc.) What land formations did you see created as you poured the cups of water? Use a map of the USA to discuss all the land formations in the country. How can we prevent erosion and runoff from moving so fast? Do immovable obstacles like the rocks alter waterways?

Name _____

Date _____

WANDERING WATER

1. What happened to the soil on the plastic tray when we poured the first cup of water?

2. What happened when we placed the rocks on the plastic tray?

3. Did the rocks cause the path of the water to change? Why or why not?

4. What could change the route of a stream today?

5. What happened when we tipped the plastic tray higher?

6. Give a real-life example of erosion.

7. If erosion goes unchecked, what will happen to the overall water supply?

8. How can methods of conserving and protecting water help keep the overall supply of water safe?
