

Lesson Title: Watersheds: The Clean-Up Job

Ohio Standards Connection:

Standard(s):

Benchmark(s): (grades 3-5) C. Describe Earth's resources including rocks, soil, water, air animals and plants and the ways in which they can be conserved.

Indicator(s):

Grade(3)

Grade(4)

Grade(5) 5. Explain how the supply of many non-renewable resources is limited and can be extended through reducing, reusing and recycling but cannot be extended indefinitely.

6. Investigate ways Earth's renewable resources (e.g., fresh water, air, wildlife and trees) can be maintained.

Lesson Summary: Students will explain the importance of soil and healthy watersheds in cleaning water.

Estimated Duration: class period

Background: A watershed is a land area that drains off to a natural body of water or surface water. Any rain that falls on or snow that melts in this land area runs off or drains into that body of water (and some deep percolates into the groundwater). A healthy watershed both stores and filters water before it reaches streams, rivers or lakes. As water percolates into the soil, the soil acts as a filter and removes impurities. Wetlands and healthy riparian areas (naturally vegetated areas long streams and rivers) also filter impurities from the water. Soil, riparian areas and wetlands also store excess water reducing flooding from rain events, too.

We don't often think about where precipitation goes after it hits the ground. Storm water runoff can carry many pollutants with it as it travels across the landscape including motor oil, grease, gasoline, antifreeze, soil and many other substances. Storm water runoff can be absorbed into uncompacted soil, but most often runs down hill over impervious surfaces like pavement, sidewalks and compacted soil eventually ending up in a nearby water body. Pollutants carried in this storm water then contaminate surface water and groundwater.

Watersheds play an important role in filtering and storing water. A watershed with plenty of trees and other vegetation, but little pavement or exposed soil, can help filter out many non-point source pollutants before they reach bodies of water. They also help prevent flooding by allowing storm water to soak into the soil.

Instructional Procedures:

1. Block the hole in the bottom of the flowerpot with a ball of cotton.
2. Pour about a teaspoon of soil into a jar of water and stir. Add just enough soil to the water to make the water muddy.
3. Put 2-3 charcoal briquettes in a plastic bag and crush them with a hammer.
4. Mix the crushed charcoal with the soil and fill the flowerpot with the mixture.
5. Hold the flowerpot over a clear bowl and *SLOWLY* pour about half of the muddy water into the flowerpot.
6. Compare the water in the bowl that has drained through the flowerpot with the water remaining in the jar. That water in the bowl should be relatively cleaner.

Note: the water is still not drinkable.

Extension: Use a coffee filter to simulate how wetlands trap and filter pollutants.

Explain to your students that a healthy watershed, like the flowerpot model, can clean certain non-point source pollutants from the water. Ask your students how a healthy watershed cleans water (it does this by slowing down water and allowing it to filter gradually into the soil. It also cleans water by moving it through organisms such as plants). Ask your students what characterizes a healthy watershed (e.g. lots of vegetation year-round, no pollution from industry, urbanization or agriculture, minimal pavement and construction).

Materials and Resources: Flower pot, large clear bowl, cotton balls, clear glass or jar, 2 or 3 charcoal briquettes, enough soil to fill the flower pot, 2 cups of water, hammer, plastic bag.

Vocabulary: watershed, non-point source pollution

Adapted from On the Trail of Non-Point Source Pollution, produced by Two Herons Environmental Consulting for the Soil and Water Conservation Districts of Butler, Clermont, Hamilton and Warren counties in Ohio. 1992.