

A DAY BY THE BUFFALO

WATERSHED WORKS

Through experiment, research projects and games in the classroom and in the field, students learn about the importance of our natural surroundings and the role of human beings in the *protection* of the outdoors.

TEACHER BACKGROUND

Water affects many things. It shapes the face of the Buffalo River Valley, carving canyons, hollows, and rock shelters. It sculpts the land into stones small enough to skim across a creek, and boulders so large that only flood waters can move them. It seeps through porous rock, carving out large caverns and narrow crawl spaces, and depositing tiny delicate crystals resembling needles. It erupts from the ground as springs, sometimes emerging in the shape of roaring waterfalls and other times as small seeps where ferns grow from cracks in the rock.

Trees, ground vegetation, even last year's fallen leaves help to clean and filter water run-off. By holding soil in place, they prevent *erosion*. When plants are removed from the land, soil often moves into streams, filling them with silt and making the water murky. This can change the entire cycle of life found in a stream.

The amount and cleanliness of water on your land depends not just upon your actions, but also those of your neighbors. Something thrown into a *sinkhole* or small *cave* on your neighbor's property could seep through the soil, enter an underground creek, and emerge as a spring on your land. Likewise, something thrown into a *tributary* stream, or flowing water, outside the park eventually winds its way down into Buffalo National River.

We share the limited supply of water in the *Ozarks* with plants, animals, and our neighbors. Maintaining its cleanliness becomes a greater challenge as the area becomes more populated, more trash is generated, and more water is needed for washing cars and clothes. We all share the responsibility to ensure that our wells, springs, and *tributaries* are clean, and our trash properly disposed of. It means good health for us and the *environment*.



CLASSROOM: PRE-VISIT ACTIVITIES

ACTIVITY 1. Filter Facts

STATE STANDARD

Science - Strand 4: Earth and Space Science

Standard 8. Earth Science: Structure and Properties

Students shall demonstrate and apply knowledge of Earth's structure and properties using appropriate safety procedures, equipment, and technology.

OBJECTIVES

Students will:

1. explain how soil and vegetation help to filter water.
2. describe karst topography and explain how water travels through it.

MATERIALS

- two capped clear plastic litter bottles that have bottoms removed and a small hole punched into the caps
 - fill bottle “A” with mostly rock below and a shallow layer of soil on top
 - fill bottle “B” with alternating layers of rock, soil, and vegetation material (twigs, leaves, grass, etc.)
- one additional container filled with visibly DIRTY water to pour into the other bottles
- two empty containers to catch the DIRTY water as it leaves the other bottles

ACTIVITY

1. Ask for volunteers to hold bottles “A” and “B” side-by-side for the rest of the class to see. Ask for two other volunteers to hold the clean, empty containers under each bottle.
2. Pour the DIRTY water into bottle “A” while a volunteer catches water in a clean container. Observe the results and record.
3. Now pour the DIRTY water into bottle “B” while a volunteer catches water in a clean container. Observe the results and record.
4. After the demonstration ask these questions or create a discussion:
 - a. Did they see any difference in the water after it flowed through the bottles?
 - b. Which was the cleanest and why?

- c. Discuss *karst topography*
- d. Discuss importance of vegetation such as trees, leaves, plants, forest organic litter and soil on the filtering process.

DISCUSSION

1. Do you suppose the vegetation cover makes much of a difference in the water quality of a watershed?
2. What effect does karst topography have on water quality?
3. If you discharge DIRTY water through a karst system, what might you expect to find as a result in area springs and seeps?



NATIONAL RIVER: ON-SITE ACTIVITIES

Activity 2. Lost Valley Hike

STATE STANDARDS

Science - Strand 4: Earth and Space Science

Standard 8. Earth Science: Structure and Properties

Students shall demonstrate and apply knowledge of Earth's structure and properties using appropriate safety procedures, equipment, and technology.

Science - Strand 1: Nature of Science

Standard 1. Characteristics and Processes of Science

Students shall demonstrate and apply knowledge of the characteristics and processes of science using appropriate safety procedures, equipment, and technology

OBJECTIVES

Students will:

1. define **ecology** and give an example of how things interact in the **environment**.
2. define **tributary**.
3. name 1) a tributary of the Buffalo River, and 2) the river into which the Buffalo flows.
4. describe water's role in shaping the **biological environment** of Buffalo National River.
5. explain how plants help to clean the water.
6. explain the importance of clean water to society and the environment.
7. describe the purpose of **national parks** in **preserving** natural **communities** and why clean water is important.
8. explain how a person's actions can help or harm **tributaries**.

MATERIALS

- day pack
- drinking water

ACTIVITY

Be prepared to hike with a ranger approximately 1.5 miles and spend approximately 1 hour on a moderately strenuous trail into Lost Valley. Activity begins in the Lost Valley parking lot off of Highway 43 in Boxley Valley.

CLASSROOM: POST-VISIT ACTIVITIES

Activity 3. Downhill Running

STATE STANDARDS

Science - Strand 4: Earth and Space Science

Standard 8. Earth Science: Structure and Properties

Students shall demonstrate and apply knowledge of Earth's structure and properties using appropriate safety procedures, equipment, and technology

Science - Strand 1: Nature of Science

Standard 1. Characteristics and Processes of Science

Students shall demonstrate and apply knowledge of the characteristics and processes of science using appropriate safety procedures, equipment, and technology

English - Strand: Oral and Visual Communications

Standard 1. Speaking

Students shall demonstrate effective oral communication skills to express ideas and to present information

OBJECTIVES

Students will:

1. state a relationship between plants and soil stability.
2. describe the effects people have on the land.

MATERIALS

- jugs of water
- paper
- pencil

ACTIVITY

1. Ask your students to select two equally sloping sites on or near the school grounds. One site should be covered with bare soil only. Roadway cutbanks, for example, work well. The second site should have good vegetational cover; for example, grass, leaves, and moss. Or you can develop your own landscapes using two large trays and sand, rocks and vegetation, etc.
2. Ask the students to pour equal amounts of water over these two slopes and observe the results.



3. Ask these kinds of questions:
 - a. How does the vegetation effect the rate at which the water moves downhill?
 - b. On which slope does most of the water reach the farthest downhill?
 - c. What happened to any debris (twigs, leaves) on the bare soil when the water was poured, including where the debris went?
 - d. Discuss circumstances they can think of where *erosion* might be a problem, for example, soil erosion along roadsides.

4. Once the observations and discussion have concluded, ask each student to state in his or her own words (either orally, in writing or both) any relationships identified between plants and soil stability.

KEY WORDS

national parks, protection, Ozarks, cave, sinkhole, erosion, ecology, environment, tributary, polluted, karst topography, biological environment, preserving, communities

RESOURCES

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