

LESSON PLAN #5 Conservation and the Future of the Driftless Area

Overview:

As seen in past lessons, the Driftless Area has been affected by human interaction especially mining and farming activities. In recent years conservation efforts have been put in place to help maintain and restore our prairies, water quality, and native species.

Jo Daviess Conservation Foundation has taken a leadership role in creating, restoring, and maintaining parks and recreational areas. Land and water preservation is one of its main focuses. Another organization committed to the protection and management of native prairies and savannas in our county is the Prairie Enthusiasts.

The Galena League of Women Voters has been instrumental in developing a plan to address the poor water quality of the lower Galena River. Their efforts led to the formation of The Galena River Watershed-based Planning Committee which continues to develop plans to improve water quality and to protect and preserve ground water.

In 2008 a group of Jo Daviess County concerned citizens created a grass roots organization called HOMES to stop the establishment of a megadairy consisting of over 5000 head of cattle. This group's main concern was the porousness of the soil in the county. The karst allowed run off to enter the water table. The concern was what would happen with that many cattle located in one space. Because of their continuing activism over a number of years, the plans for the dairy were finally halted. County citizens also have a concern about the building of a four lane highway from its east to west borders and continue to monitor its planning.

The Stephenson, Carroll, Winnebago and Whiteside County Soil and Conservation Districts have several programs designed to conserve soil and protect water quality. One such is the Conservation Practice Program which provides cost share assistance and other financial incentives for the construction of or the adoption of projects that reduce soil erosion and improve water quality. Another program is the Water Well Decommissioning project to help protect against groundwater pollution. Stephenson County also has a Wetland Reserve Program where they offer landowner the opportunity to protect, restore and enhance wetlands on their property. Freeport, in Stephenson County, has a Illinois Nature Preserve for prairie land.

These major initiatives in the preservation and conservation of resources in our counties are also enhanced by numerous smaller groups and efforts.

Duration: 30 - 50 minutes

Subject Areas: Earth Science, Physical Science, Life Science, Social Science

Standards Addressed:

5-ESS3-1
ESS3.C
MS-ESS3-1
MS-ESS3-3
SS.G.2.4
SS.G.1.5
MS-LS2-1
MS-LS2-4

Objectives:

- Define what is meant by The Driftless Area. What other factors affect the conservation of our county's resources
- What is the importance of maintaining these resources

Glossary:

Conservation: the prevention of injury, decay, waste, or loss of resources

Groundwater: surface water that has seeped down beneath the surface

Watershed: the region or area drained by a river, stream, etc.

Wetlands: land that holds water; marshes or swamps

Point source pollution: a single identifiable source of water pollution

Nonpoint source pollution: a source of pollution that is widely distributed or a wide spread environmental element.

Activity: Recreating the Driftless Watershed**Supplies needed for each group:**

Spray bottle
Large aluminum baking pan or plastic tub (16 x 11)
Large (18inch wide) sheet of aluminum foil
Five to six crumpled soda cans
Masking tape
Thin sponge (red or yellow for visibility)
Scissors
Food coloring (yellow, red, blue)
Cup of fine soil or cocoa powder

Activity Steps:Phase 1: Building the Model

1. Break the class into 3-4 groups of students
2. Give each group a large aluminum baking pan or plastic tub
3. Instruct students to tape together a pile of crumpled soda cans in the center of the pan
4. Have the students gently mold a continuous sheet of aluminum foil over the cans and the bottom areas of the pan. The goal is to create a model with several hills and sloping sides. Note: Be careful not to tear or punch a hole in the foil.

5. Give each group a spray bottle tinted with yellow food coloring (adjusted to provide a mist and not a stream of water.)
6. Instruct the students to gently “rain” on their watershed model and observe where the water flows and the resulting lakes and streams that form.
7. Students should note how the rivers and streams stop flowing shortly after it stops “raining.”

Phase 2: Addition of Wetlands and Groundwater systems:

8. Each groups should cut three or four small strips of sponge and gently place these in various locations on the model. (The strips are wetlands and groundwater areas that are often “recharged” by surface water. These areas then in turn contribute water the rivers, streams and lakes.
9. The students should again gently rain on the models and observe the effects of the wetlands and groundwater systems.(sponge strips)

Phase 3: Track point source and nonpoint source pollution:

10. The teacher should place a drop of blue food coloring on a sponge near the top of each model. (Explain this is an example of a pollutant such as an oil spill or a raw sewage leak.)
11. Have the students gently “rain” on their watersheds and observe what areas the pollutant impacts.
12. Next the instructor should sprinkle fine topsoil or cocoa powder on each watershed model and have the students create a gentle rain. The students should observe the movement of the soil or cocoa powder towards waterways and the effects on these systems. (Explain to the students that the soil or cocoa powder represents nonpoint source pollutants that can result from construction sites, agricultural practices, lawn care products and hard surface run off.)

Discussion Questions:

- How did the placements of wetlands and groundwater sites(sponges) affect the flow of water on your model?
- How did pollution move through you watershed model?
- Give three examples of point source pollution. Nonpoint source pollution
- In what ways could water users downstream of the pollution source be impacted?
- What are strategies that could be adopted to help protect watersheds.
- What are pros and cons of maintaining our resources?
- What can we do as individuals to maintain the resources of the Driftless Area?
- What can we do as a community to maintain these resources?