

Lesson Five: Best Management Practices for Nonpoint Source Pollution

Overview

This lesson deals with agricultural and urban management practices designed to reduce nonpoint source pollution.

Grade Level:

6th - 10th

Time Frame:

One to three 45-minute lessons

Academic Question

What are the policies and programs for nonpoint source pollution?

Objective

To research and assess different agricultural and urban management strategies to reduce nonpoint source pollution

Product/ Application

Lead a discussion on nonpoint source pollution from Lesson Two, Section Three. Ask students to conclude the scenario from that lesson by recommending a best management practice that would help prevent or reduce the nonpoint source pollution they modeled. Students will need to research the different best management practice note cards in order to make this determination.

1. Ask students where they think most nonpoint source pollution comes from. Explain that the leading source of nonpoint source pollution of water is agriculture.
2. Have students research nonpoint source pollution best management practices. Best management practices are those practices recommended to prevent and/or reduce the threat of nonpoint source pollution. Divide students into two groups. Have one group conduct an Internet search for agricultural pollution best management practices. Have the second group conduct an Internet search for urban pollution best management practices. (See the resource section for helpful web sites.)
3. Each group should record their findings on large note cards that can be stored in a file box for later use. Each note card should contain the following information.

Note Card Information:

- a. Name of best management practice

- b. Type of nonpoint source pollution that is prevented
- c. Assign a star rating of effectiveness of practice (allow students to determine a rating system)
- d. People most likely to use best management practice
- e. Description of management practice and how it prevents or reduces nonpoint source pollution
- f. Type of activity this practice replaces or improves upon
- g. Cost of practice (if information is available)

Have students return to the Conducting A Watershed Survey Manual section Land and Water Uses That Affect Water Quality. After rereading the different nonpoint source scenarios, have students recommend a best management practice that would help prevent or reduce nonpoint source pollution. Students will need to research the different best management practice note cards in order to make this determination.

Assessment

Allow the agricultural pollution best management practices group and the urban pollution best management practices group to present their findings. Create an evaluation checklist with your students that they will use to measure the successful completion of a best management practice note card.

Resources

Best Nonpoint Source Documents

U.S. Environmental Protection Agency

<http://www.epa.gov/owow/nps/bestnpsdocs.html>

Nonpoint Source Pollution Control Measures - Source Categories

<http://h2osparc.wq.ncsu.edu/info/bmps.html>

The Minnesota Pollution Control Agency, *Protecting Water Quality in Urban Areas Manual*

<http://www.pca.state.mn.us/water/pubs/sw-bmpmanual.html>

TEKS Correlation

Science

Grade 6: 6.1, 6.2, 6.3, 6.4

Grade 7: 7.1, 7.2, 7.3, 7.4, 7.8, 7.12

Grade 8: 8.1, 8.2, 8.3, 8.4

Biology: (b)1, 12.D

Aquatic Science: (b)1, 4.B, 7B.C, 8.C, D

Environmental Science: (b)1, 5.A, B, C, E, F

Geology, Meteorology, and Oceanography: 10.C

English I: 1, 4, 6, 8, 13, 15, 16, 21

Geometry: 6

Precalculus: 2

Technology Applications (Computer Literacy)

Grades 6-8: 2, 4, 5, 7, 8

Social Studies

Grade 6 6.21, 6.22, 6.23

Grade 7 7.8, 7.21, 7.22, 7.23

Grade 8 8.10, 8.30, 8.31, 8.32

English II: 1, 4, 6, 7, 8, 13, 15, 16, 21

Mathematics

Grade 6: 6.1, 6.8, 6.11, 6.12, 6.13

Grade 7: 7.3, 7.4, 7.9, 7.13, 7.14, 7.15

Grade 8: 8.5, 8.14, 8.15

English

Grade 6: 6.1, 6.2, 6.5, 6.13, 6.17, 6.20, 6.22, 6/24

Grade 7: 7.1, 7.2, 7.5, 7.13, 7.17, 7.20, 7.22, 7.24

Grade 8: 8.1, 8.2, 8.5, 8.7, 8.10, 8.13, 8.17,

8.18, 8.20, 8.22, 8.24

Extension

Storm Drain Stenciling

Objective

The objective of this activity is to stencil the message: **Dispose no Waste, Drains to Creek**, on curbs above storm drains. This activity provides a hands-on action which emphasizes the fact that storm drains are connected to creeks.

Materials

Texas Stream Team is planning on supplying interested groups with materials for this exercise. Contact us at 1-877-506-1401. Another option is to allow students to create a stencil to be spray painted on storm drains in your community. Optional -GPS Units, Orange Cones

Background

In many cities there are two separate sewer systems, the storm sewer and the sanitary sewer. The sanitary sewer system collects residential wastewater (from sinks, toilets, washing machines), commercial and industrial wastewater. These wastes are collected and delivered to the wastewater treatment plant. The storm sewer system is made up of a network of pipes that connect gutters and storm drains to nearby waterways. As rain and melting snow flows over streets, roofs, and parking lots, water may collect pollutants such as litter, pesticides, heavy metals and oil. The runoff water is then collected in the storm sewer system and flows directly to the stream with little if no treatment. Since both sewer systems discharge waters to the natural environment care must be taken to prevent or minimize disposal of hazardous wastes into these systems.

Activity/Procedure

Divide into groups. Discuss duties, allow students to rotate to give everyone a chance to spray paint or apply the adhesive. Assign safety officers that will wear orange vests and set out traffic cones. The class should be reminded to wear old cloths.

Record the location of the storm drain stenciled using GPS. Download points and plot points against a map of the community. This could be done on a Saturday as a service-learning project.

You can find GIS Data online at www.usgs.gov, www.tnris.state.tx.us, also try your local city GIS data department.

Extension

Trash-Cleanup

Objective

This activity allows you to take responsibility for the place you live. After the activity, discuss what you have found and how that reflects on the community and health of the creek. Ideally, this activity should be done at least 2 times during the school year.

Materials:

paper
pencils
trash bags
extra gloves
student/parent helper

Background

The conclusion of *Conducting A Watershed Survey* offers other potential uses for the Watershed Survey including a trash clean up. This lesson provides an outline for planning a cleanup.

Activity/Procedure

The Week Before:

1. Scout out the area you will be cleaning to define the clean-up boundaries and to become familiar with the area.
2. If you are doing the cleanup with a class, make sure permission forms are taken home to parents.
3. Get trash bags and extra gloves
4. Find parent helpers

The Day Before

1. Make sure everyone has signed permission slips.
2. Divide into teams of 3.
3. Review purpose of the clean up. Explain that they will be cleaning up the watershed. Clean-ups are a very important way of maintaining and improving water quality and habitat.
4. Everyone should bring a pair of work gloves to school for the clean up.

Clean-up Day

1. Make sure everyone has paper and pencil to record items.
2. Pass out 2 plastic garbage bags per group. In one, they should put recyclable items, in the other trash.

3. Remind everyone to be careful when picking up broken glass. Tell them they should not pick up anything that looks dangerous or harmful.

After Clean-up Discussion

1. Discuss what trashy treasures were found on the clean up.
 2. How do you feel about the clean-up activity? Did you like it?
 3. What did you find out about the area around the waterway?
 4. What are some things you can do to help reduce the amount of trash found in the watershed and in/near the water?
 5. Where the trash came from? (near-by road, people on the river, etc)
 6. How did the trash get to its location? (left by people, or washed by rain)
 7. Determine the kind of trash? (plastic, glass, paper)
 8. Could this product be recycled?
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