Lesson Four: The Visual Assessment of a Watershed

Overview

Students explore a watershed and collect information through describing, photography, surveying, and physical measurement. Three activities are involved in Lesson Four focused on litter, stream flow, and temperature measurement of water.

Grade Level:
6-12

Time Frame:
Three Fifty-Minute Class Periods

Materials:
Pencils
Field Data Sheets (*Appendix of Conducting a Watershed Survey*)
Watch or Stop Watch
Thermometers
Meter Stick
Film Canisters
Camera

TEKS

Please refer to last page.

Objectives

Make observations of litter in their watershed.
Make stream flow observations
Make accurate temperature measurements.

Academic Question

What did the collected information tell you about problem areas, overall condition of the stream, good and bad land management practices, and the need for more community involvement and action?

Background

The Visual Assessment section of *Conducting a Watershed Survey* helps students understand the real world implications of their work on watersheds. Through observation students can connect many of the previous lessons on nonpoint source pollution to a local watershed and stream. The Field Data sheets included with Conducting a Watershed will serve as important tools for information gathering and help student review the information collected once back in the classroom.

Activity/Procedure

For the visual assessment it is important for teachers to first review the chapter in *Conducting A Watershed Survey,* which discusses how to choose an appropriate site and possible safety concerns. Once the group is ready for the visual assessment make sure the students are divided into groups with at least two students in each group. Begin by asking students to

take about ten minutes to draw the watershed from their current vantage point. Remind students as they draw of the previous watershed activities.

Once each student has created their own interpretation of the watershed, divide students into groups and assign one group per activity. Each group should complete their own data sheets as well. Included in this curriculum are data sheets appropriate for elementary and middle school students. The data sheets with the Conducting a Watershed Survey are more advanced and can be used with middle school and high school students. If the group plans to assess the watershed several times throughout the year, rotate each group so that everyone has an opportunity to perform all of the different activities.

Activity One: Where did the trash come from?

Ask this group to examine their watershed for litter. Remind students to document, do not ask students to pick-up any found pieces of litter. For each piece of litter the group finds they should document the litter with pictures and if possible take the GPS coordinates where the litter was found. The students should also write down:

Where the trash came from? (near-by road, people on the river, etc)
How did the trash get to its location? (left by people, or washed by rain)
Determine the kind of trash? (plastic, glass, paper)
Could this product be recycled?

Activity Two: Stream Flow

Stream flow affects the health of stream and can be easily measured. This activity may require students to get wet. It is also helpful to remind students about safety concerns. First students should mark-off a two-meter length (200 cm) along the creek. Next students should place orange peels, a cork slice, or apple peels at the upstream end of the measured section. If possible, the most accurate reading for stream flow is obtained from the middle of the stream. This might not be a safe possibility. Time ten seconds as the object (orange peel or cork) is released into the stream. Students should next measure how far the object traveled in ten seconds and divide that number by ten. That number is the stream flow rate expressed as centimeters per second. For example if the object traveled 50 centimeters in 10 seconds, then the rate of flow in that area is 5.0 centimeters/second.

Activity Three: Temperature Measurement and Collection

This group of students should first collect air temperature in a shady location away from the ground; hanging from a small tree for about 1-½ minutes is ideal. Once air temperature is recorded, then collect water temperature in a safe location in the stream. After recording air and water temperature, ask students to collect at least four different samples of the streams water in small film canisters. These canisters can be taken back to the classroom and allowed to settle to observe sedimentation. Students can also examine the pond water under a microscope.

Product/Application

Once back in the classroom ask each team to present the results of their activity and to review the results of the field observation sheets. Once students have shared their results, discuss the findings. What did the students find? Did the stream appear healthy? Pass-out the *Physical Indicators of Water Pollution Worksheet* for a reference. Were there any physical indicators of water pollution at the study site? What could be the cause?

Assessment

Have students prepare an advertising campaign to raise awareness about the health of the stream and the impacts of land use on the watershed.

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

Geology, Meteorology, and Oceanography: 10.
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

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

Geometry: 6
Technology Applications (Computer Literacy)
Grades 6-8: 2, 4, 5, 7, 8

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