Wetlands: Nature's Water Filters

Grade Level

2nd through 5th

Materials

8 celery stalks
Red or blue food coloring
Water
Paring knife
2 glass jars or beakers
Paper towels for clean up

Discussion

The objective of this activity is to simulate how wetland plants absorb pollution and serve as "natural" water filters.

Background: Natural wetlands are areas like marshes, swamps, bogs, sloughs, and floodplains that are covered with water at least part of the year. Engineers often design constructed wetlands, which are similar to natural wetlands, but are built to treat wastewater from domestic, agricultural, industrial and mining processes. Roots and stems of wetland plants form a dense mat where biological and physical processes occur to treat the wastewater. Wetland plants vary across the United States, based on native plants and climate and thrive in soil that is saturated for a significant portion of the time. Examples include grasses, blueberry bushes, red maples, and silky dogwoods, among others.

As a means of treating wastewater, constructed wetlands are fifty to ninety percent less expensive to build than conventional chemical treatment systems. (In addition to treating wastewater, constructed wetlands also create wildlife habitat and assist with flood control.)

Activity

DAY 1

1. In order to simulate how wetland plants absorb pollution put freshly cut celery stalks in colored water (divide the stalks between 2 glass jars or beakers).

2. Brainstorm the following questions with students:

-What do the students think the purpose of the experiment might be?
-What do they think will happen to the celery, food coloring and water during the proceeding 24 hours?
-What do they think they'll learn?

<u>*DAY 2*</u>

1 Divide the class into eight teams.

2. Show the class the celery in the colored water and give each team a stalk of celery.

3. Cut the celery so each group member has a piece.

4. Have each student observe how his/her piece of celery shows absorption of the pollution."

5. As a large group, discuss the following questions:

-Were the students correct about what they thought the purpose of the experiment was?

-Were they correct in what they thought would happen to the celery, food coloring and water?

-If the food coloring represents pollutants, how does the celery represent a wetland plant? (It absorbs pollutants in the water.)

-Did the celery absorb all the food coloring (pollutants)? (No.) Explain why not. (Plants only absorb as much water as they need.)

-When are constructed wetlands most commonly used? (To treat mine run-off, for small communities that cannot afford to build conventional water treatment plants, for industries and farm operations that cannot use conventional wastewater treatment systems and to treat irrigation run-off.)

-How do natural treatment systems help protect the environment? (They replace the use of chemical treatment systems. They are natural and existing, and subsequently have little impact on the environment.)

-Why will these types of natural systems be increasingly important to us in the future? (As our world population grows and our natural resources become increasingly limited, we will need to find more ways to maintain our quality of life while protecting the environment. Natural treatment systems help achieve this goal.)

-What role do engineers play in developing constructed wetlands?

For additional information, visit the EPA Office of Wetlands, Oceans and Watersheds at: http://www.epa.gov/owow/wetlands.

This activity was provided by CH2M HILL (http://www.ch2m.com) and the Water Environment Federation (http://wwwweforg) for National Engineers Week 2000.