

HOW CLEAN IS YOUR STREAM?

OBJECTIVES

At the end of this lesson, the students will be able to do the following:

1. Explain, orally or in writing, what elements make-up a clean stream or how to tell if the stream is "dead".
2. Construct a model of a healthy stream, a polluted stream and a "dead" stream.

SUBJECTS: Science

TIME: 40 Minutes

BACKGROUND INFORMATION


Pollution, either point or non-point, in water can have a detrimental affect on all living things, especially those organisms that live in water and depend on the oxygen in water to breathe. Besides the poisoning affect pollution can have on a stream, some pollutants take oxygen out of the water making it impossible for certain species to survive.

Species that are tolerant to pollution include leeches, certain snails, and horseflies. These species get the oxygen they need from atmospheric air not from water. These species are usually associated with water of low quality. When pollution is not present, more oxygen may be present in the water. Species like mayflies, riffle beetles, and freshwater clams may be present in water of a higher quality. These species breathe oxygen in the water, much like a fish.

One thing to remember, however, is that in non-polluted water, species tolerant to pollution may be found with intolerant species, however the opposite is not true. Species intolerant to pollution are not found in polluted water.


Scientists use the number present in each individual species to determine water quality. Water with a large number of species, but few individuals from each species is considered more desirable than having many individual insects from the same species.

MATERIALS:

- *Towels to represent a stream
- *Cutouts of water quality indicator insects (insect cutouts found in the storybook  P.33)
- *Water Quality Groups reference sheet

PROCEDURE

I. Setting the stage

- A. Discuss with students why it is important to know the quality of a body of water. Show students insects found in high quality water, intermediate quality water, and poor quality water. (**Science TEKS K.2A, K.5A, K.6A,C, K.9A,B, 1.2A, 1.5A, 1.9A,B, 2.21A, 2.5A, 2.9B**).
- B. Make copies of the "Water Quality Groups" reference sheet located in this book and pass out to the students. Have students study the different insects on the page.
- C. Let students color and then cut out the insects on the "Cutout Cards" ( P.33) and compare them to the reference sheet.
- D. On the "cutout cards", color the "Good" water quality indicators (Group 1) GREEN, the "Intermediate" water quality indicators (Group 2) YELLOW and the "Poor" water quality indicators (Group 3) RED.

II. Activities

- A. Lay the towels out in the shape of a small stream.
- B. Divide the students into two groups. Have Group 1 be the scientist and Group 2 be the people putting out the insects.

Send members of Group 1 away for a minute while Group 2 decides if they want to have a good stream, an intermediate stream, or a poor quality stream. Group 2 will pick out four insects that make up the quality of stream they have chosen and place them in the stream (towel).
- C. Group 1 will return and collect the insects in the stream. They will then compare them with the Water Quality Groups reference sheet and circle the insects that they have found. After the insects are identified, Group 1 will decide if the stream is good, intermediate or poor.
- D. The groups will then reverse roles until both groups have produced all three qualities of streams.

III. Follow-Up

- A. Ask students why they think certain insects might be able to survive in high quality water but not in low quality water (oxygen levels, poisoning, loss of habitat).

- B. What other animals using the stream might be affected by pollution?
(fish, mammals that use the water, humans).
- C. What are some of the ways oxygen can be put back into water?
(plants, removal of pollution)

IV. Extensions

Bring in actual stream insects for students to compare to the reference card.

RESOURCES

Watershed Protection and Management: Stormwater Division, San Antonio Water System, January 1999.