

How long have the Rivers been Polluted?

by David Clarke

Grade level 5 - 7

Time required

One 45 minute class period

Materials/Technology

Garbage bags

Paper/pencils

Summary

Through discussion and analysis of collected garbage, students will become aware of the harmful effects of human activities on an ecosystem.

Objectives

The student will:

- 1) classify, describe, and compare objects and substances based on common physical properties.
- 2) explain the interdependent nature of biological systems in the environment and how they are affected by human activities.

Montana Science standards addressed

- 1) Students demonstrate knowledge of characteristics, structures and functions of living things, the process and diversity of life, and how living organisms interact with each other and their environment.
- 2) Students understand how scientific knowledge and technological developments impact society.

Assessment

Have students write a short essay on what they think can be done about stream and river pollution and how they could make a difference themselves.

Background Information

Throughout history, some people have dumped their garbage and other wastes into the rivers. In the past, there were fewer people and the river was big enough to handle small amounts of pollutants (substances that destroy the purity of air, water, or land). When there were fewer people polluting the rivers with fewer, less harmful substances, the damage done was reversible. Today, the amount of pollutants being dumped into the river is greater than ever before in the history of the earth. This is due to the increase in population. Along with the increase in population, there has been an increase in the amount of pollutants that have long degradation periods. The amount of garbage generated by each person in the United States is about 5 pounds per day. Some of this trash ends up in the rivers, causing damage that may not be reversible. Garbage is a very visible form of river pollution. People frequently dump their trash along the banks of the river or just leave it lying there after recreating. Some garbage, such as plastics, are not very biodegradable. Besides making the banks dirty from trash, the contents of modern

garbage can be dangerous to life in the rivers. Most of the pollutants that enter the river come from raw sewage, chemical fertilizer, pesticides, poisonous metals and oil. Raw sewage can contain disease-causing bacteria. Poisonous metals such as mercury, lead, cyanide, and tin come from factory and mine wastes. These metals are often taken in by fish and passed along to humans and other animals that eat them. Cattle grazing along rivers or in other riparian areas is another concern. Cattle degrade the river banks and add nutrient to the water from their excrement.

Procedure

- 1) Take students down to the river to collect garbage along the banks (if this is not an option, bring in a few bags of trash).
- 2) After the trash is collected, have the students categorize it into five or more groupings (I use glass, metal, styrofoam, plastic, and paper).
- 3) Have groups create a pie chart showing the percentage of garbage found in each category.
- 4) Generate a discussion on what materials make up the largest number of items thrown away, which type of materials make up the smallest number of items thrown away, what materials were not present in nature 200 years ago, what pollutants were in the river that you may not have been able to collect, etc.
- 5) Extension: Go to the Tribal Council meeting and adopt (pick up trash monthly) the local fishing access site.

Further Information

For further information about this lesson, contact David Clarke via electronic mail at DClarke@montana.com.