

Is Mother Nature a Polluter?

Subject Area: Erosion

Unit Title: Nonpoint source pollution

Grade Level: 4th & 5th grade

Objectives: To help students identify some of the sources of pollution including nonpoint source pollution.

Colorado Content Standards to be covered:

SCIENCE

Standard I - Students understand the processes of scientific investigation and design, conduct, communicate about, and evaluate such investigations.

Standard III- Students understand how physical processes shape earth's surface patterns and systems.

Materials:

- sticky notes (or scraps of paper)
- five 12” square pieces of thick cardboard
- five 9” x 13” baking pans or disposable aluminum pans
- soil
- water
- leaves
- twigs
- small rocks
- a piece of sod
- paper towels
- a small watering can
- glass jar (larger than 1 qt.)

Anticipatory Set: Brainstorm with your students about pollution making a list on the board of the types of pollution they know about. Then, create and

model filling out a Vocabulary Map (see below left) by having students fold a piece of paper into 1/2 and then 1/2 again. Then they should open the paper and write in the middle the word “nonpoint source pollution.” In the upper left corner they should write the definition or “what it is.” The definition is: pollution coming from many places. Then they should write in the upper right “what it isn’t.” In the bottom left write an example such as erosion, etc. Finally, in the lower right they should draw a picture or use the word in a sentence. Then ask the students to write “true” or “false” on a sticky

What it is:	What it isn't:
Vocabulary Word: Nonpoint Source Pollution	
Example:	Draw a Picture or Sentence:

note in response to this question: Can mother nature pollute?

Input:

Do you know what the number one threat to clean water in the U.S. is? It's nonpoint source (NPS) pollution. Nonpoint source pollution is pollution coming from many places at once instead of a single spot. NPS pollution is sometimes called polluted runoff.

Is Mother Nature a Polluter? Is this just a crazy idea? How can pollution be caused by nature? It turns out that there are a number of examples where natural deposits of minerals or other elements can threaten water quality. Now let's think about snowmelt in the mountains. Not only does some evaporate, but some soaks into the ground. What if somewhere on that mountain there was an abundance of a natural element that could poison fish? The runoff on the surface and the water that soaked into the ground could carry that element into a waterway. Another source of naturally occurring pollution is the erosion of soil after a forest fire. The exposed soil would normally be held together by trees and plants, but after a fire the soil is exposed to snow and rain which can cause erosion.

Of course there is also man-made pollution up in the high country. Remember the gold rush? Unlike today's mines, early gold mines were often dug without any concern for the environment. Or, the mines were abandoned once they weren't profitable. Unfortunately, some of those mines are still causing problems. Surface and groundwater wash through some of these sites, carrying contaminants into rivers and lakes. Some mine sites have threatened not only fish, but drinking water in some mountain communities.

If the water can get polluted up in the high country, think of all the places along the way to your house where it could be polluted. You might say, "We all live downstream."

Checking for Understanding: At the end of this section choose one of the following for a quick check: ask the students to partner share and think, pair and share, do a quick 3 word write up as an exit slip, do a quick sketch or give each other a quick thumbs up or down to check for understanding. Determine the level of mastery for each student and provide individual remediation as needed.

Procedures/Activities:

1. Get the soil moist. Put a piece of cardboard at an angle in each pan. (About three inches of cardboard will stick out of the side of the pan.) Cover the cardboard with 1-2" of soil in each pan.
2. Leave one pan as is.
3. Add leaves to one pan.
4. Set the twigs into the soil in one pan.
5. In another pan, add the rocks.
6. Add the piece of sod to the last pan.
7. Fill the watering can with one quart of water. Hold the spout about 2" above the cardboard and sprinkle water over the soil in each pan. Observe the differences between pans.
8. To compare the amount of soil that has been eroded, fold a paper towel into a cone shape. Place it in the mouth of the jar. Remove the cardboard, soil, etc. from the pans and pour the muddy water from each pan into the jar, emptying the jar in between. Compare the amount of soil on each of the paper towels noting which pan they came from, using fractions or percentages.
9. Why do you think there are differences?

Closure:

Discuss the findings of your experiment and then re-ask the students the question you asked in the beginning... "Can mother nature pollute?" Discuss any changes they might have had in how they answered previously. Find local examples if possible