It's A Dirty Water Thing

(30-60 minute activity in classroom)

Objectives

The student will be able to:
1) Identify potential sources of increased turbidity
2) Predict results and experiment on sediment levels of a nearby creek

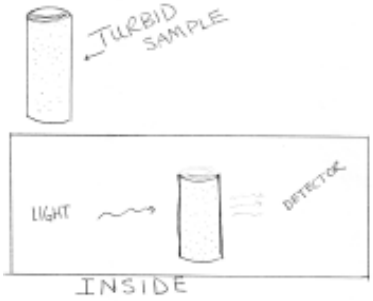
Materials

- ❑ Glass jar
- ❑ Coffee filter or cheese cloth
- ❑ Lightweight fabric
- ❑ *Kids in the Creek* student worksheet
- ❑ Pencil

Background

Turbidity and Sediment

Sediments are always present in aquatic ecosystems. This natural process introduces needed nutrients and streambed materials into the system. However, changes or disruptions to the stream bank, riparian area, and uplands can exaggerate the normal cycles. Sometimes during stormy periods, rain will release soil and pollutants from fire-scarred hillsides where vegetation has been removed. Both soil particles themselves and the *non-point source pollution* they may carry can be threats to water quality. Unless this is a frequent occurrence, aquatic wildlife can compensate. However, an overabundance of soil *erosion* can increase suspended particles, attracting heat and raising temperatures. With higher temperatures, levels of dissolved oxygen decrease. Certain fish and many *macroinvertebrates* prefer cooler water. *Silt* can settle into spawning gravel, choking eggs. Sensitive fish and insect gills inundated with silt cannot obtain needed oxygen to survive. More tolerant species may replace them over time.



Total suspended solids (TSS) measures the amount of *sediment* a stream is carrying. *Turbidity* is a measurement of how cloudy water is. TSS and turbidity are different. A stream may have a high TSS because it is carrying many large soil particles, but these particles would not necessarily make the water very turbid. On the other hand, if the stream were carrying great amounts of very small particles, the TSS would be low and the turbidity high (very cloudy). More turbidity equals less penetration of light into the stream. A turbidimeter, or *nephelometer*, measures the amount of light passing through it.

Procedure

1. Go to a nearby stream after a hard rain. Does the water look different from before the storm? A change in color or clarity may be a sign of non-point source pollution.

2. Fill two jars with water from the stream, measuring the quantity in each. If no stormwater is available, prepare two jars with water and stir a large spoonful of soil into each jar.

3. Pour the water from one jar through a coffee filter into a clear container. Were any sediments caught?

4. Measure the amount of sediment caught in the filter, if possible, or estimate its volume. How many parts of sediment per parts of water were captured in the filter?

5. Cover the opening of the second jar with one layer of lightweight cloth, then pour the water out through a clean coffee filter into a second clear container. Does the water from this jar seem cleaner? Was the amount of sediment captured in the coffee filter more or less than from the first jar? The cloth represents riparian vegetation and wetlands. They filter out some of the sediments and other pollutants carried by runoff water, helping keep the streams healthy.

Assessment

Ask students to:

- ❑ List sources of turbidity in streams
- ❑ Relate the connection between increased sediments and levels of DO and temperature
- ❑ Describe the role of riparian vegetation and wetlands in reducing sediment loading