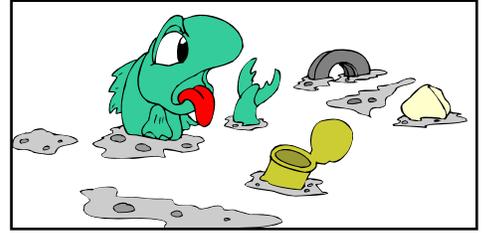


A Contaminated Creek

Adapted from "Deadly Waters" Aquatic Project WILD, Council for Environmental Education 1992.



Grade Level: 6th - 12th, Grades

Subject: Science

Duration: 45- 60 minutes

Materials: Watershed Video (optional), Pollution Information Sheet, pollution signs, graph paper, colored pencils, different colored beads, tablespoon, Best Practices Information Sheet

Next Generation Sunshine State Standards: SC.6.N.1.1, SC.7.N.1.1, SC.8.N.1.1, SC.7.L.17.3, SC.8.L.18.1, SC.912.L.17.20, SC.912.L.17.16, SC.912.L.17.15, SC.912.L.17.7

Common Core Benchmarks: LACC.68.WHST.1.1, LACC.68.RST.1.1, LACC.68.RST.3, LACC.1112.RST.1, LACC.910.WHST.1, LACC.1112.WHST.3

Overview: Water pollution continues to be a global threat and a local problem in our waterways in FL. Students will act as scientists using a virtual sample of water from a contaminated creek. They will identify and graph the types of pollution found in the sample. They will analyze the water to determine the potential effects on humans and the wildlife.

Objectives: Students will

- Graph the types of pollution found in the contaminated creek.
- Identify the types of pollution and their possible source
- Identify the affects of the pollution on wildlife and humans

Background: Water pollution occurs when foreign substances get into the water and make the water harmful to people and wildlife. Basically it is any change that is harmful to living things. There are two sources of pollution, point and nonpoint source pollution. Point source pollution comes from a specific location and can easily be identified. An example of point source pollution would be an oil spill like the BP oil spill in the Gulf of Mexico in April 2010. Point source pollution can be prevented, because you know the cause and can do something about it. Nonpoint source pollution is harder to identify. This source of pollution usually enters waterways by stormwater runoff. Because nonpoint source pollution comes from a

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variety of sources it is more difficult to prevent. Examples of nonpoint source pollution are fertilizers and soil erosion.

There are a number of different types of pollution but scientists usually divide them into 4 different categories: chemical pollution, thermal pollution, organic pollution and ecological pollution. **Chemical pollution** consists of toxic substances entering waterways, like pesticides or acid rain. **Thermal pollution** occurs when the temperature of the water varies above or below the normal condition. Power plants will often release warm water produced by turbines. **Organic pollution** is the oversupplying of nutrients into waterways. Excess fertilizer would be an example of organic pollution. Natural triggers cause **ecological pollution**. Extreme tides will increase the amount of salt into areas that normally do not have that level of salinity.

Procedure:

1. Pass out the **Pollution Information Sheet**. Review each type of pollution and explain that each will be represented by a different color.
2. Post the signs that show the color code for each type of pollution.
3. Tell students that they will be given a water sample (represented by beads) of a creek that needs to be tested and analyzed.
4. Give each group of students 2 scoops of the beads.
5. Students sort the beads by color, count and record the number of each.
6. Have the students set up graph paper with number of occurrences on the vertical axis and the types of pollution on the horizontal axis arranged in the same order as the Pollution Information Sheet: Brown, Red, Pink, Black, Green, Purple, Yellow (this will be essential when you are grading papers).
7. Using the colored pencils, have students graph the amount of each pollutant. Each bead represents a unit (or occurrence) of pollution.
8. The top 4 occurring pollutants are considered damaging to the wildlife habitat.
9. Students are to list the types of pollutants that are damaging to their creek.
10. Using the Pollution Information Sheet, have them determine the possible source of the pollution as well as the effect on habitat.
11. Using the Best Practices Information Sheet, discuss ways to reduce the amount of pollution added to the environment.

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Assessment: Students write a story about their creek that includes the types of pollution, the source of the pollution, and what can be done to prevent future pollution. (Option for larger groups, have each student write one sentence in a different color pencil and put them together for one cohesive story - may need a bit of editing before it is cohesive).

Resources:

Watershed Video:

<http://www.swfwmd.state.fl.us/video/multimedia/index.php?yuurl=LJ63xGJY4pM>

Florida Water Coalition: <http://floridawatercoalition.org>

Nutrients Water Quality Standards for the State of Florida:

http://water.epa.gov/lawsregs/rulesregs/florida_index.cfm

Water Quality Monitoring:

<http://www.swfwmd.state.fl.us/education/kids/watermonitoring>

SWFWMD Teachers Guide to Watersheds - Middle School:

http://www.swfwmd.state.fl.us/education/resources/FloridaWatershedsVideo_MidSchTeachersGuide.pdf

SWFWMD Teachers Guide to Watersheds - High School:

http://www.swfwmd.state.fl.us/education/resources/FloridaWatershedsVideo_HSTeachersGuide.pdf

Water Smart Connections: Topic Water Quality, Publication by SWFWMD

"Water Monitoring" www.earthforce.org