

Stream Monitoring

Eco-Schools Topic:

Water

Grade Level:

Grades K-8

Standards:

n/a

Guiding Question:

How can aquatic life indicate the health of a body of water?

Key Questions, Attitudes and Behaviors to Teach of the Water Unit:

- We live in the _____ Bay Watershed. (K)
- The health of the Chesapeake Bay is important to me. (A)
- I turn off the sink when I brush my teeth. (B)

Lesson Objectives:

- Students will be able to identify some aquatic macroinvertebrates
- Students will understand how aquatic life indicates how healthy water is
- You will either be ***taking students to a stream or bringing stream samples to the classroom.***

Materials:

- For monitoring at stream
 - Table
 - Net with poles
 - Clipboard
 - Pencils
 - Ice cube trays
 - Forceps
 - Magnifying glasses/boxes
 - Waders (boots)
 - Neoprene gloves
 - [Stream Insects and Crustaceans ID Card](#)
 - For additional materials, see <http://www.vasos.org/monitors-page/equipment-list/>
- For gathering samples and bringing them to the kids
 - Net or bottles
 - Rock or other heavy object
 - Pencils
 - Ice cube trays
 - Forceps
 - Magnifying glasses/boxes



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- Waders (boots)
- Neoprene gloves
- Newspaper
- [Stream Insects and Crustaceans ID Card](#)

Prep:

- For monitoring at stream
 - Look on a map to find a stream near you
 - Coordinate with SACC director to make a plan for having kids at a river (field trip forms, etc)
 - Become familiar with identifying macroinvertebrates using the [Stream Insects and Crustaceans ID Card](#)
 - Familiarize yourself with gathering macroinvertebrates
 - Scrub rocks, search in muck and leaf debris or walk around in sampling area. Look at [this page](#) for more details.
- For gathering samples and bringing them to the kids
 - Look on a map to find a stream near you
 - Set up your net or bottles in the river for up to a week before you will be doing the lesson with the kids. Secure it down with a rock or another heavy object. Retrieve the net or bottle right before doing the lesson with the kids. See points above for additional tips on how to find macroinvertebrates.

Engaging Intro

- Ask the kids what they use water for/why is it important
 - We drink it to stay alive!
 - It provides a habitat for plants and animals.
 - We can get food by fishing in lakes, rivers, and oceans.
- Ask the kids if they know what water pollution is/what it does to water
 - It makes the water dirty and unhealthy, hurts marine animals
- Share definitions:
 - **Watershed:** An area of land where all of the water (rain, creek, human uses, etc.) will eventually drain into a larger body of water (we live in the Potomac Watershed that filters into the Chesapeake Bay watershed).
 - **Pollutant:** something harmful to the environment (ex. Trash, chemicals, greenhouse gases)
 - Explain how land use around a river affects how polluted it is
 - If a river is surrounded by a parking lot, the river will be full of trash and oil
 - If a river is surrounded by a forest, it will not have much pollution in it at all
 - **Macroinvertebrates:** aquatic insects, crustaceans, or worms
 - Macro=big (you can see them with your naked eye)
 - Invertebrate=no backbone
 - **Tolerant** (can live in polluted water) or **intolerant** (cannot live in polluted water)
 - Explain how identifying a lot of tolerant macroinvertebrates indicates that a stream is unhealthy, a mix of tolerant and intolerant macroinvertebrates indicates a somewhat healthy stream, and a stream with a lot of intolerant macroinvertebrates is very healthy



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Exploratory Activity: 2 options

- For monitoring at stream
 - Use [this website](#), specifically the [Training Resources](#) page
 - Pass out [Stream Insects and Crustaceans ID Cards](#) and help the kids identify the macroinvertebrates
 - Make sure they pay close attention to whether the macroinvertebrates are tolerant or intolerant. Keep a tally of both types.
- For gathering samples and bringing them to the kids
 - Lay down newspaper
 - Put the macroinvertebrates in ice cube trays using the forceps.
 - Pass out [Stream Insects and Crustaceans ID Cards](#) and help the kids identify the macroinvertebrates
 - Make sure they pay close attention to whether the macroinvertebrates are tolerant or intolerant. Keep a tally of both types.

Meaningful Discussion

- Look back at your tally of tolerant vs intolerant macroinvertebrates and make a conclusion about the river's health based on your results.
 - If there was mostly tolerant and few- none intolerant macroinvertebrates, then the river you sampled from is unfortunately unhealthy, like some rivers in Fairfax county.
 - If there were the same amount of tolerant and intolerant macroinvertebrates, then the river you sampled from is somewhat healthy, like most rivers in Fairfax county.
 - If there were more intolerant macroinvertebrates, then the river you sampled from is healthy! This is fairly rare in Fairfax county.
- Ask students where they think pollution comes from. Is it just one place, one person?
 - No, there are lots of different pollution sources! Review point source and nonpoint source pollution
- Brainstorm together what those different sources of pollution are and solutions
- Ask them why they should be concerned about any one river.
 - We get our drinking water from there! Fairfax County gets their water from the Occoquan reservoir and Potomac River: See steps below.
<https://www.fairfaxcounty.gov/soil-water-conservation/where-does-drinking-water-come-from-fairfax-county>

Links and Resources

- Stream monitoring
<http://www.vasos.org/>
- Water pollutants:
<http://www.environmentlaw.org.uk/rte.asp?id=90>
- What is a Watershed?:
<https://oceanservice.noaa.gov/facts/watershed.html>

We want to thank Virginia Save Our Streams as many of the materials in this lesson are shared from their website.



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