Macroinvertebrate Bug Kick

Objective: Students will learn a method for observing water quality using macroinvertebrates as bioindicators, and understand that water pollution is a human impact

Age Group: Middle, High

Materials:
- ✓ Sample trays or buckets
- ✓ Macroinvertebrate data sheets and ID sheets
- ✓ 3-4 kick nets or multiple handheld mesh nets
- ✓ Forceps or tweezers
- ✓ Protective gloves

Curriculum Connection:
8.E.1→ Understand the hydrosphere and the impact of humans on the local systems
Bio 2.2→ Understand the impact of human activities on the environment

What you need to know:
Macroinvertebrates are small animals (macro=visible to the naked eye, invertebrate=no backbone) like insects, snails, or crayfish. Many of them live either all or part of their lives in water, finding shelter under rocks and pebbles in small streams. Several species of macroinvertebrates are intolerant to water pollution. Finding those species in a creek or stream could mean the water quality is good. In this way, macroinvertebrates are *bioindicators*. Their presence or lack thereof indicates the quality of the water being sampled.

The activity:
- ❖ Divide students into small groups and provide them with 1 kick net or several small nets (students should be wearing water shoes or rubber boots)
- ❖ Direct groups to riffle areas (shallow, moving water) where they can dig their nets into the pebbles and rocks
- ❖ Students must sift through their nets to find and remove macroinvertebrates (they can handle all macroinvertebrates with their hands, GENTLY, except for Dobsonfly and Crayfish. If they are uncomfortable using their hands, provide them with forceps or gloves)
- ❖ Empty macroinvertebrates into sample trays (trays should have a small amount of clear creek water)
- ❖ Use ID sheet to identify which macroinvertebrates students have found, and record data on data sheet
- ❖ Carefully return all macroinvertebrates to the stream after data collection is complete
- ❖ Determine the water quality of the stream using data sheets
- ❖ Back in classroom, compare findings and results

Follow Up:
Was the water quality good, fair, or poor? If it was poor, why do you think that is?

What kinds of pollutants might end up in bodies of water that surround our cities and homes?

What kinds of animals depend on healthy water to survive?

List some reasons why healthy creeks and streams are so important.

MACROINVERTEBRATES—BIOTIC INDEX

Name and Partner's Name:

Our hypothesis:

Species	Caught? (Y/N)
Backswimmers (I)	
Threadworms (I)	
Leeches (I)	
Water Striders (I)	
Giant Water Bugs (I)	
Blackflies (I)	
Midges (I)	
Crayfish (II)	
Dragonflies (II)	
Damselflies (II)	
Clams (II)	
Snails (II)	
Craneflies (II)	
Riffle Beetles (II)	
Stoneflies (III)	
Dobsonflies (III)	
Mayflies (III)	
Caddisflies (III)	
Water Pennies (III)	
Other species?	

Biotic Index Value	Water Quality
Greater than 22	Excellent
17 to 22	Good
11 to 16	Fair
Less than 11	Poor

A) Number (III) Intolerant Species: _____ x 3= _____

B) Number (II) Moderately Tolerant Species: _____ x 2= _____

C) Number (I) Tolerant Species: _____ x 1= _____

A+B+C= BIOTIC INDEX VALUE _____

The water quality in _____ is (circle one):

Excellent   Good   Fair   Poor