



## Unit 2, Station 3, Activity 3 - Critter Cube Count<sup>2</sup>

In this activity, you will learn about macroinvertebrates so you will be able to do your own biological testing when you take a trip to the GREEN Zone in Unit 3.

The object of the Critter Cube Count is to determine a water quality score for an imaginary stream. The game simulates the steps followed to check the water quality of a local stream using macroinvertebrates. To actually use this method, you would go to a stream, collect macroinvertebrates (or “water critters”) in a net, and then identify them. You would record the types and numbers of critters in a formula on the Macroinvertebrate Tally Sheet. The results can help you predict if your stream is healthy or polluted.

### Your team will need:

- “Macroinvertebrate Tally Sheet” and “Key to Macroinvertebrate Life in the River”—your leader will provide both
- Four “Critter Cubes”
- An ice cream bucket or similar container
- A clear, flat surface like a card table or a clear area on the floor

### Directions

1. The “Macroinvertebrate Tally Sheet” shows pictures of macroinvertebrates grouped according to their sensitivity to pollutants. Group 1 is the most sensitive; group 4 is the least sensitive. On the back of the tally sheet, see how to calculate the

health of the stream by sampling the critters found there.

2. Now play the game:
  - a. Place four Critter Cubes into the container provided by your leader.
  - b. Shake the bucket so the cubes are mixed.
  - c. Dump them onto a flat surface.
  - d. Use the “Key to Macroinvertebrate Life in the River” and tally sheet to identify the macroinvertebrate pictures that are face up on each of the dice.
3. Circle the corresponding pictures on the tally sheet and enter the total number of animals you circled for each group in the boxes. Follow the directions on the form to determine the score for the imaginary stream you just “sampled.”
4. How healthy was your stream? Answer this and other questions in your Zone Notes. Don’t forget to put your notes and your tally sheet in your Zone Notebook when you’ve finished.



### Zone Notes - Critter Cube Count

- How healthy was the “stream” in your game?
- Where would you be more likely to find critters sensitive to pollution: in a stream that is surrounded by riparian vegetation or in a stream with little or no vegetation along its banks? Why?

<sup>2</sup> Adapted in part from *Water Action Volunteers—Volunteer Monitoring Factsheet Series*. (Univ. of Wisconsin—Extension and Wisconsin Dept. of Natural Resources, 2001)

# Unit 2, Station 3, Activity 3—Critter Cube Count

**Group 1: These are sensitive to pollutants. Circle each animal found.**



Stonefly Larva



Dobsonfly Larva

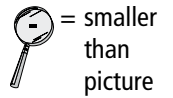
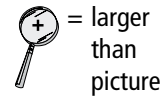


Alderfly Larva



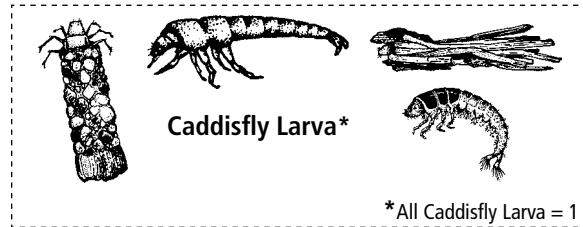
Water Snipe Fly Larva

Relative Size Key:



Number of group 1 animals circled:

**Group 2: These are semi-sensitive to pollutants. Circle each animal found.**



Caddisfly Larva\*

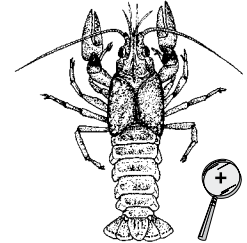
\*All Caddisfly Larva = 1



Dragonfly Larva



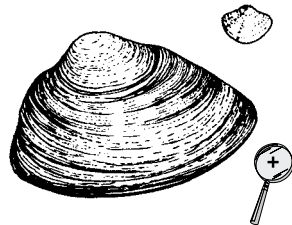
Water Penny



Crawfish



Crane Fly Larva



Freshwater Mussel or Fingernail clam



Mayfly Larva



Damselfly Larva



Damselfly tail (side view)



Riffle Beetle Larva\*

Riffle Beetle Adult\*

\*All Riffle Beetles = 1

Number of group 2 animals circled:

**Group 3: These are semi-tolerant of pollutants. Circle each animal found.**



Black Fly Larva



Non-Red Midge Larva



Snails: Orb or Gilled (right side opening)



Amphipod or Scud

Number of group 3 animals circled:

**Group 4: These are tolerant of pollutants. Circle each animal found.**



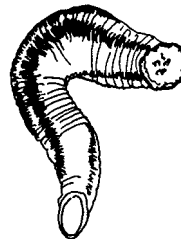
Pouch Snail (left side opening)



Isopod or Aquatic Sowbug



Bloodworm Midge Larva (red)



Leech



Tubiflex Worm

Number of group 4 animals circled:

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**Water Action Volunteers**

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# Unit 2, Station 3, Activity 3—Critter Cube Count

## Macroinvertebrate Tally Sheet Recording Form \*

Name: \_\_\_\_\_ Date: \_\_\_\_\_

Stream Name: \_\_\_\_\_ Time: \_\_\_\_\_  
(make up a name)

Number of animal types from Group 1: Sensitive \_\_\_\_\_ x 4 = \_\_\_\_\_

Number of animal types from Group 2: Semi-sensitive \_\_\_\_\_ x 3 = \_\_\_\_\_

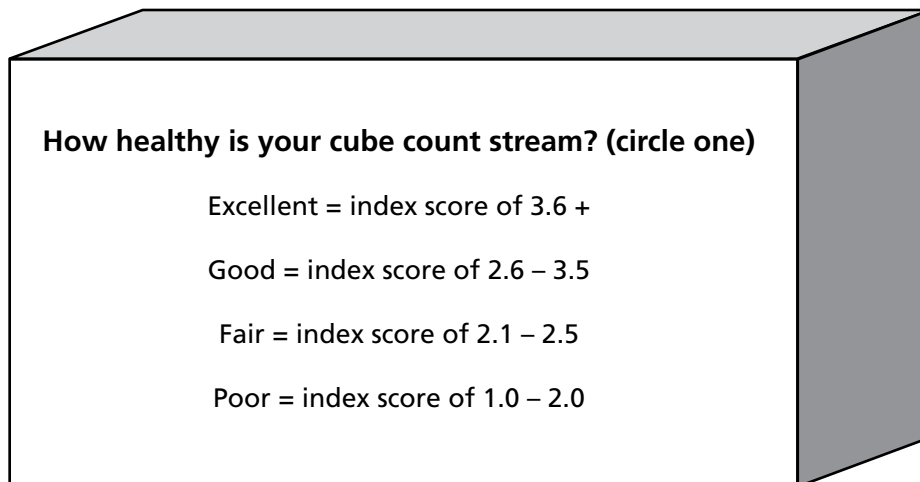
Number of animal types from Group 3: Semi-tolerant \_\_\_\_\_ x 2 = \_\_\_\_\_

Number of animal types from Group 4: Tolerant \_\_\_\_\_ x 1 = \_\_\_\_\_

TOTAL NUMBER OF ANIMAL TYPES (A) \_\_\_\_\_ TOTAL VALUE (B) \_\_\_\_\_

Index score (C) = The total value (B) divided by the total number of animal type (A)  
(C = B / A)

My stream had an index score of: \_\_\_\_\_



\* Adapted from *Water Action Volunteers*, Univ. of Wisconsin-Extension and Wisconsin Dept. of Natural Resources, 2008.