Determining Water Quality Using Bioindicators:

*Analyzing a Macroinvertebrate Sample*

Macroinvertebrates are excellent indicators of water quality because of their sensitivity (or lack of sensitivity) to water pollution. A wide variety of macroinvertebrates often indicates that a water source is healthy, while only a few different organisms may indicate that the water cannot support aquatic life. Similarly, pollution-tolerant species such as scuds may be found in abundance in unhealthy water, because they have very little competition from species that cannot live in unhealthy water.

To analyze the macroinvertebrates in your pond or lake:

You should have a bag with a set of cards inside. On each card is a macroinvertebrate taken out of the water source you are studying. You will use a sampling method called **sequential comparison** to determine the biotic index, in this case the Sequential Comparison Index, which can be used to measure water quality.

**Sequential Comparison:**

Remove one card from the bag and place it on your table. This begins your first row. Rows can have any number of cards, including a single card.

Remove a second card. Each card is compared to ONLY the card before it.

* If the second card is the SAME as the first card, place it in the same row.
* If the second card is DIFFERENT from the first card, place it below the first card to begin your second row.

Continue this process for all cards- you will need lots of room! ***Remember to only compare each card to the one before it- for example, if the THIRD card is different from the second card, it begins a new row- even if it is the same as the first card. Once you begin a new row, you CANNOT place any cards in a previous row.***

**Finding the Biotic Index:**

Once all your cards are placed into rows, count the total number of rows you have:

# of Rows: \_\_\_\_\_\_\_\_\_\_\_\_\_

Now count the total number of macroinvertebrates present (the total number of cards on the table)

# of Organisms: \_\_\_\_\_\_\_\_\_\_\_\_

Finally, determine the biotic index by dividing the total number of rows by the total number of organisms.

# of Rows = **\_\_\_\_\_\_\_\_\_\_\_**  =

# of Organisms

**Biotic Index Scale**

0 – 0.34 = Poor

0.35 – 0.64 = Fair

0.65 – 1.0 = Good

Describe your sample below. What was your biotic index and what does this indicate about the quality of the water? Did you see a high amount of biodiversity or were there only a few species present? If you had one species that appeared many times, why do you think that occurred?

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