

## Biotic Index

### Objectives:

- For students to understand what the biotic index is and how it is used to determine the purity of a body of water. Students will accomplish this objective by finding the biotic index of bodies of water and by creating an environment for a specific biotic index.
- For student to use Excel to organize data and to calculate the biotic index of a body of water.

**Scenario:** The Commissioner for Frederick County Natural Resources Department wants to create a man-made lake in Emmitsburg. Knowing that your class has been studying biotic indexes, he has asked you to determine the make-up of organisms for this lake for a given biotic index range.

The requirements for this man-made lake are as follows:

- Each class of organisms must be represented in the lake
- There must be a total of 100 organisms in the lake
- There must be a minimum of 3 organisms from each species
- The lake needs to have a biotic index in the range of 4.7-5.2

Use Excel to help you organize and calculate your data. For each attempt that you try, record your resulting biotic index in the spaces provided below. Once you succeed in reaching the desired biotic index, place the fish sticker next to your final answer. (If you need more spaces to record your biotic index attempts, please add more on the back of this page.)

Biotic Index:

1<sup>st</sup> Try: \_\_\_\_\_

2<sup>nd</sup> Try: \_\_\_\_\_

3<sup>rd</sup> Try: \_\_\_\_\_

4<sup>th</sup> Try: \_\_\_\_\_

5<sup>th</sup> Try: \_\_\_\_\_

### Reflection Questions:

1. Were you successful on your first attempt to manipulate the biotic index to the given interval? If so, what is the proportion of each class of organisms to the total organisms? How are these proportions related to the water quality of the man-made lake?
2. If you were below the given interval in your first attempts, what class did you add to or subtract from to put your answer in the correct interval? Why?
3. If you were above the given interval in your first attempts, what class did you add to or subtract from to put your answer in the correct interval? Why?
4. What relationship exists between the proportion of each class to the total number of organisms and the biotic index?

5. What are some other things that you have heard of, besides manipulating organisms, which could improve water quality?
6. What do you think about using the Biotic Value Index to evaluate water quality? Do you think it is an accurate method? Do you think it is efficient in attempting to improve the water quality of bodies of water? Why or why not?