



Stream Health Biotic Index

Students sampled macroinvertebrates at two sites on a creek. Use the practice counts to calculate a biotic index for each site.

Name _____ Date _____

Group	Organism	Site 1	Site 2
Sensitive (× 3)	Mayfly nymph	23	
	Stonefly nymph	4	
	Caddisfly larva	15	2
	Hellgrammite		
	Riffle beetle	6	
	Water penny	3	
	Gilled snail		
Somewhat sensitive (× 2)	Dragonfly nymph	2	
	Damselfly nymph		1
	Crayfish	5	3
	Scud	8	
	Sowbug		14
	Clam or mussel		
	Crane fly larva		
Tolerant (× 1)	Aquatic worm	3	30
	Leech		9
	Midge larva	10	42
	Black fly larva		6
	Lunged snail		12
	Rat-tailed maggot		

How to score: count the number of different kinds (not individuals) present in each group. Multiply by the group value and add the three products.

	Site 1	Site 2
Sensitive kinds × 3		
Somewhat kinds × 2		
Tolerant kinds × 1		
Index		

Sample rating scale: over 22 excellent, 17–22 good, 11–16 fair, under 11 poor. Based on common volunteer stream monitoring methods.

1. Rate each site.

2. Why does the index count kinds of organisms rather than total individuals?

3. Site 2 is below a storm sewer outfall. Propose two explanations for its lower score.

4. Recommend a management action that could improve Site 2, and describe the data you would collect to show it worked.



For teachers

Grade 11 Answer Key

Accept reasonable answers that are supported by evidence.

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Site 1: $5 \times 3 + 3 \times 2 + 2 \times 1 = \mathbf{23}$ (excellent). Site 2: $1 \times 3 + 3 \times 2 + 5 \times 1 = \mathbf{14}$ (fair).

Counting kinds measures diversity; one tolerant species can occur in huge numbers in polluted water. Site 2 explanations: sediment, warm runoff lowering oxygen, pollutants from streets. Actions: upstream green infrastructure, riparian plantings; monitor the index, DO, and turbidity over several seasons.