Quality conclusion

Students will compare biotic sampling to chemical testing to determine the overall quality of the sample taken.

Directions

Complete the following water data charts based upon your previous chemical, physical, and biotic sampling.

Biotic sampling

Sensitive	**Somewhat sensitive**	**Tolerant**
☐ Caddisfly Larvae ☐ Hellgramite ☐ Mayfly Larvae ☐ Gilled Snails ☐ Rifle Beetle Adult ☐ Stonefly Larvae ☐ Water Penny Larvae	☐ Beetle Larvae ☐ Clams ☐ Crane Fly Larvae ☐ Crayfish ☐ Damselfly Larvae ☐ Dragonfly Larvae ☐ Scuds ☐ Sowbugs ☐ Fishfly Larvae ☐ Alderfly Larvae ☐ Watersnipe Larvae	☐ Aquatic Worms ☐ Blackfly Larvae ☐ Leeches ☐ Midge Larvae ☐ Lunged Snails
boxes checked × 3 **= _____ index value**	**boxes checked × 2** **= _____ index value**	boxes checked × 1 = _____ index value
Water quality rating **Total index value = _____**	Excellent (> 22)	Fair (11–16)
	Good (17–22)	Poor (< 11)

Chemical and physical testing

Temperature: _____ °C	**Water odors**
Dissolved oxygen: _____	☐ normal/none ☐ sewage ☐ petroleum
pH: _____	**Water surface oils**
Turbidity: _____	☐ slick ☐ sheen ☐ globs
Phosphate: _____	**Turbidity (if not measured)**
Nitrite: _____	☐ clear ☐ slightly turbid ☐ turbid
Nitrate: _____	

Reflection

1. Compare both the chemical water quality tests and the macroinvertebrate sampling results. How does the chemical testing compare with the biotic testing? Do they both predict the same overall water quality or are the results inconsistent?
2. Explain: How it is possible to have different results? How do chemical/physical tests differ from biotic data?
3. Determine the water quality for the collected water samples above.

Portions of this activity adapted from Barbour, M.T., J. Gerritsen, B.D. Snyder, and J.B. Stribling. 1999. Rapid Bioassessment Protocols for Use in Streams and Wadeable Rivers: Periphyton, Benthic Macroinvertebrates and Fish, Second Edition. EPA 841-B-99-002. U.S. Environmental Protection Agency; Office of Water; Washington, D.C.