

Stream Data Analysis Lesson Plan

Grade level(s): 9

Standards Met: including Science & Technology and/or Ecology & Environment Standard(s)

4.2.10.C.

Explain the relationship between water quality and the diversity of life in a freshwater ecosystem

Explain how limiting factors affect the growth and reproduction of freshwater organisms

Objectives: Students will be able to calculate a biotic index based on macroinvertebrates collected in a stream. Students will be able to predict overall health of the stream visited using macroinvertebrate identifications.

Materials:

Macroinvertebrate data from stream sampling experience

Procedures:

Engage: QOTD: What impressed you the most about the field trip?

Explore: Either pictures or slides of macroinvertebrate larva and adult species will be shown. Students will be asked to either discuss and/or write a brief statement about the importance of both forms in the food web. Since students just participated in field trip, students will be asked if stream was healthy or not. Discussion will be steered to describing health of stream quantitatively (vs. qualitatively).

Explain: Students will be shown how to manipulate data including calculating the biotic index (possibly graphing the results of each category and subcategory for use in comparisons with historical data or other sites [*see below]).

Elaborate: Students will then use the data collected from the field trip as well as a biotic index key to tally both subcategory and an overall biotic index value. This value will be correlated with the overall health of the stream studied.

*If time permits (or as additional lessons), students will compare either/or historical data for the collection site, which would include conditions such as temperature, water flow, etc. and/or data from other sites.

Evaluate: WTL: Students will write a paragraph explaining how the diversity of life can be used as an indicator of water quality in an ecosystem and will contain a concluding statement about the stream just visited.

Anticipated Problems & Adaptations:

Students may struggle performing the calculations. Sample calculations will be provided and students will work in teams.