



## Measuring Water Quality with Macros (Scenario B: Learning Experience #2) Opportunities for Student Assessment



Opportunities for ongoing formative assessment are embedded throughout the learning experience in questions that spark class discussions and student reflection. Student data sheets, journal entries and class presentations also serve as formative assessments as the students work throughout the learning experience. The summative assessment for this learning experience is the written report of the groups' plan for developing a wetlands area or body of water for recreation and ecotourism. The plans could also be presented to the entire class on a project board, as a PowerPoint presentation, or a video if there is time and the resources to do so. Each student in the team should be involved in the final presentation's development and documentation. Sharing the grading rubric with the students when you introduce the learning experience will help them meet your expectations for quality work. You may use the rubric found below or design your own.

All students should be able to write an answer to the lesson essential question at the conclusion of this learning experience.

### Student Science Journals

Journaling is an important part of a practicing scientist's day to day work. Student-scientists should reflect, write and draw in a journal or notebook as they answer questions and plan next steps in the problem solving process. Entries should be dated and labeled with names of team contributors and where the team is in the planning process. Occasional journal review by the teacher provides an informal assessment of students' progress and their understanding of the content. Sharing the rubric with the students when you introduce the learning experience will help students meet teacher expectations for quality work.

### Suggested Student Journal Rubric, Measuring Water Quality with Macros (LE2)

Criteria	N/A	Missing	Below Expectations	Meets Expectations	Exceeds Expectations
Lesson Essential Question					
Prediction of numbers & species of organisms					
Rules for field study and macroinvertebrate sampling					
Prediction of water quality at site as per sampling					
Reflection					



### Suggested Rubric for *Is Anybody There?* (Student Sheet #1)

Criteria	N/A	Missing	Below Expectations	Meets Expectations	Exceeds Expectations
Description of water sample					
Description of site's canopy/ cover					
List of plants and animals in sample site					
Recording of aquatic animals sampled at site					
Inclusion of all team members					

### Measuring Water Quality with Macros Cross-Curricular Connections

#### Literacy Connections

When students write in their journals, describing the conditions of the aquatic habitat in their project site, they are practicing detailed observation skills and use of appropriate vocabulary. This science lesson could be expanded in an English class into an essay about valuing the natural world, a descriptive poem about what was observed on a field trip outside the school, a description of the process of working with others, or a blog post or letter to the editor of a newspaper about their experiences.

#### Social Studies

The public knows that the quality of our surface and groundwater is protected by the rules and regulations of local, state and federal governmental agencies, but do we know which agencies? As a part of a social studies lesson, students could research the regulations that exist in their own area and how those regulations are enforced. Just as elected officials frequently debate the pros and cons of governmental regulations regarding environmental quality or set-asides of land for public use, students could be divided into teams that research and debate these issues.

#### Math

Map your stream or wetland study area and calculate the population density of each species of macroinvertebrate per area unit. Why would a scientist be interested in having this information over the period of several years?