

The Maine Lakes Conservancy Institute

Students of Nobleboro Central School, located in the midcoast region of Maine, work with the Maine Lakes Conservancy Institute as part of their science class. Using a digital microscope, laptop computers and other tools, students of different abilities and interests engage in a multi-disciplinary approach to science education. Ken Williams, their science teacher, was asked to write a summary of his eighth grade lesson.

Maine is blessed with thousands of freshwater lakes and ponds, and these lakes have a significant impact on the economy. As a state with just over one million residents and a tourist-based economy, lakes are a vital piece of the economic formula in Maine. For students, two major points surface as the big bold ideas: The first is the training and experience on the more academic aspects of lake science. The second is to try to convince students on a more emotional basis that their lakes are worthy of an attitude of stewardship.

Nobleboro Central School eighth graders have been lucky enough to be part of the Maine Lakes Conservancy Institute's partner school outreach program. Prior to students going aboard the Maine Lake Conservancy Institute's floating classroom, MLCI professional staff members come to school and deliver specific information about the state of Maine's freshwater.

On the visit to school, MLCI educators cover information on:

- Lake economic value to the state of Maine, via facts, figures, and discussion

- Information on invasive aquatic plants, delivered via a slide show and Web-based "Quest"

- Organization and classification of micro and macro life forms, via activity and role-playing

- Water density and lake turnover, via discussion and slide show.

Following the classroom visit, a floating classroom field trip is organized. While on the MLCI's boat, the Melinda Ann, students move from station to station using the floating classroom gear. These items include secchi disk, plankton tow, USB microscope, hydrophone, benthic dredge, underwater camera and water column sampling for temperature and density.

The assessments hinge mostly around whether or not students complete work in final form for entry onto the MLCI Web site. Rubrics are developed that direct student-built contributions to the MLCI Web site. The students must complete work that fits into more than one category as prescribed under the MLCI Student's Portal. This allows for some choice, which leaves room for student ownership of discourse. As long as students fit their work into the framework of the MLCI student portal, and, as long as the work is professional and error-free, then they have met the requirements.

The Lesson

1. Site visit from Maine Lakes Conservancy Institute staff. The staff covers the following information prior to boat cruise:

- a. Lake economic value to state of Maine
- b. Invasive aquatic plant situation slide show
- c. Organism classification-micro/ macro, invertebrate/vertebrate, phytoplankton/zooplankton
- d. Water density and lake turnover because Maine has a true four-season climate.
- e. Equipment utilized:
 - Secchi disk,
 - USB digital microscope,
 - underwater camera,
 - hydrophone,
 - benthic dredge,
 - water column sampler for temperature and dissolved oxygen

2. Field trip-students rotate from tool to tool in groups of three or four:

- a. Secchi disk-students to enter data onto spreadsheet with column headings such as location, station, and secchi disk reading
- b. USB microscope images get saved on laptop for review back in class
- c. Hydrophone: Have fun trying to document underwater burping efforts from a prone position on the Melinda Ann's deck.
- d. Underwater camera: Note findings on laptop in AppleWorks word processing document
- e. Water column sampling for temperature/density study. Put data onto spreadsheet with Depth and Temperature as column headings.

3. Classroom-based follow-up:

Students work in small groups and as individuals to develop new entries for Maine Lakes Conservancy Web site's Students' Portal (<http://www.mlci.org/students/default.aspx>). They upload their projects from the classroom.