

This Lake Alive!

An Interdisciplinary Handbook for Teaching and Learning about the Lake Champlain Basin

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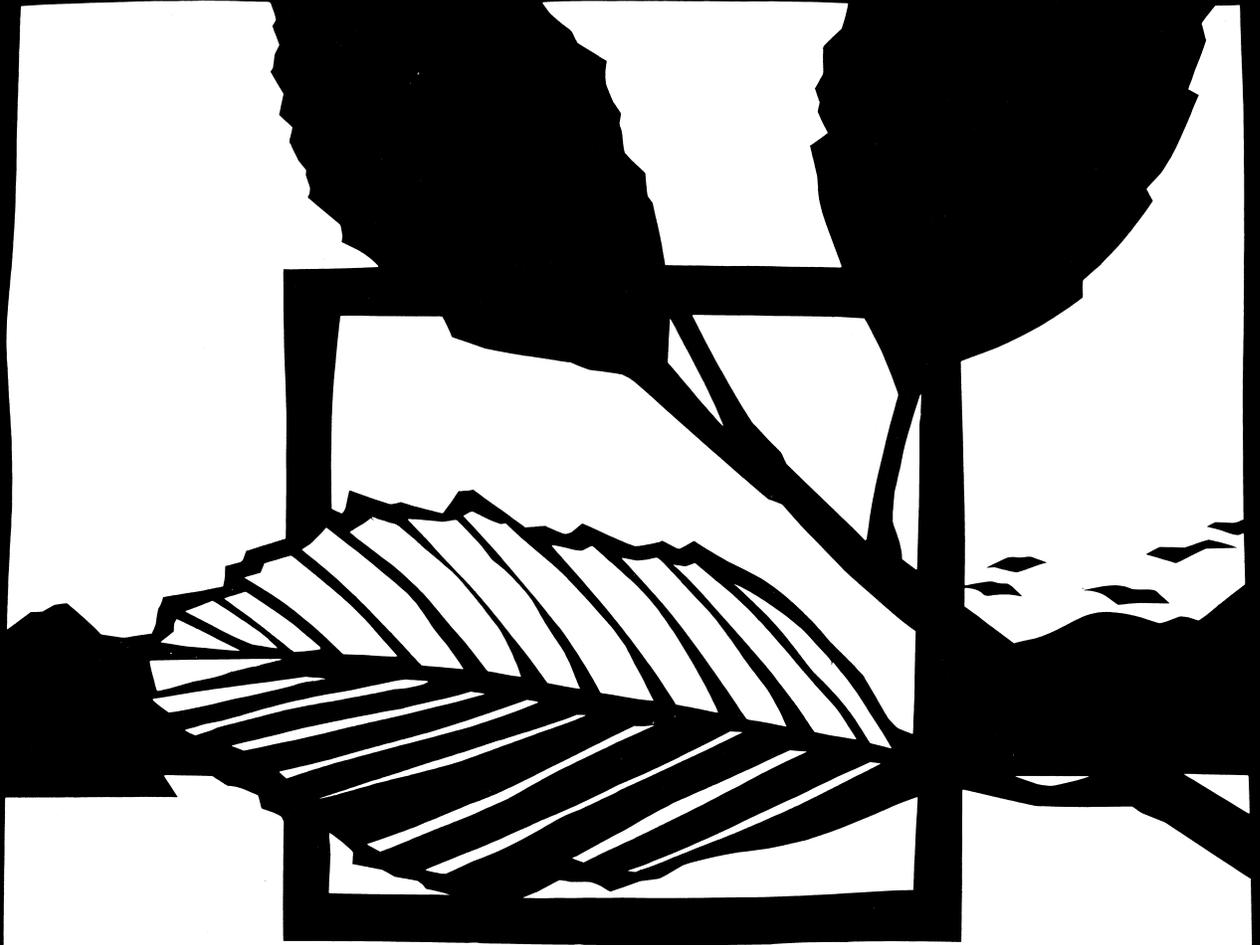
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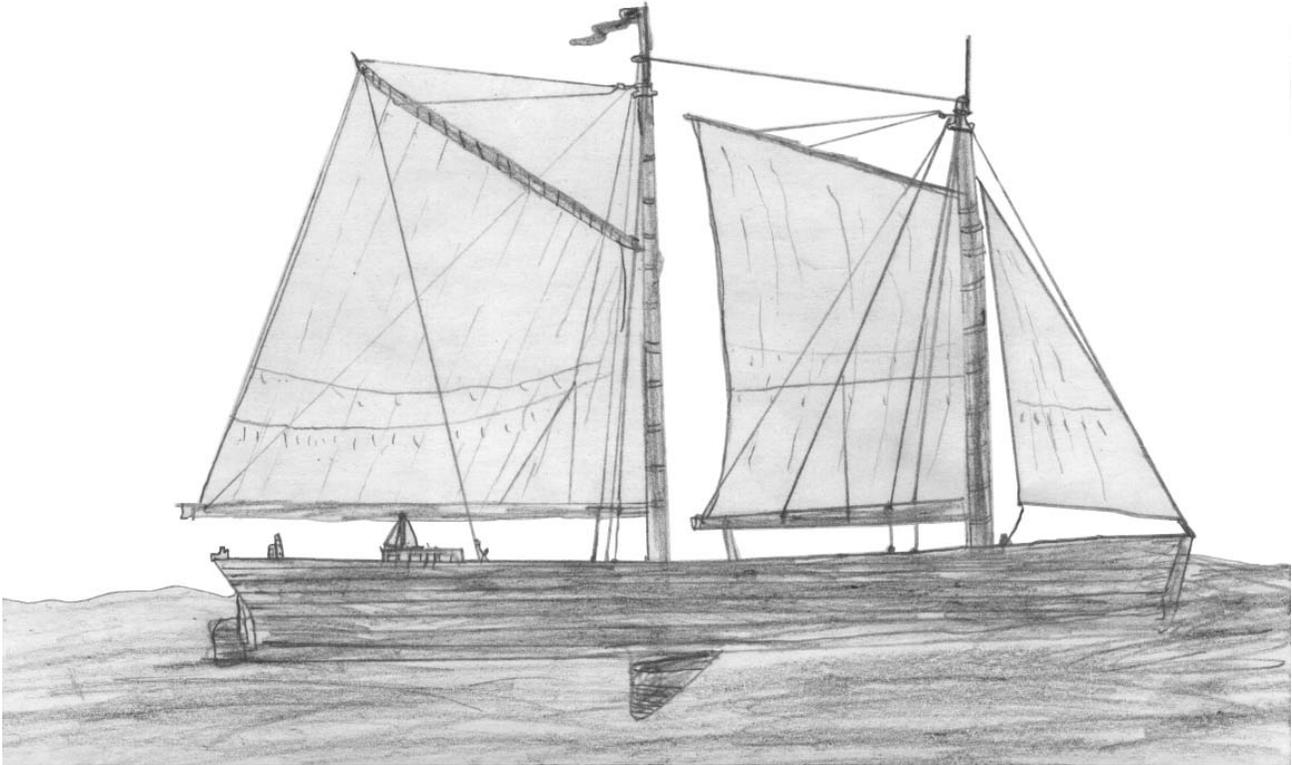
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Assessment

The General Butler

by Jason Pariseau, Grade 5, School Street School, Milton, Vermont



The *General Butler* was a canal boat on its way to Burlington carrying tons of granite. It went out in a storm which is now called the storm of the century. Captain William Montgomery was the owner of the boat. There were two teenage girls on the boat, one which was his daughter. There was also an injured sailor aboard. His eye was injured. The boat was hitting waves ten feet tall. All the passengers had to jump off the boat onto the breakwater. A man in a row boat went and brought them to shore. The *General Butler* sank on December 9, 1876.



Introduction

Learning is a human activity. I would like to discuss assessment in this context. There is a tremendous amount of valuable information available to educators on assessment but the discussion often fails to put education in its human context. At the risk of sounding too simplistic, I believe educators are people who choose to communicate with children and be part of children's emotional, social and intellectual development. Who we are as individuals greatly affects the choices we make and these choices drive the structure and content of this human experience. Equally, the personalities, learning styles and emotional and social needs of the students we teach affect this experience.



Mary Dupont contemplates a writing piece with a fifth-grade author.

People communicate in different ways. When you are telling a friend a story and she says, "What do you mean?" you may decide to give an example or draw a picture. As teachers, we constantly use and adjust our communication skills to tell stories and present information. As we teach, as we tell the story, we assess whether students are "getting it"—are excited and engaged—and make adjustments on the spot and over time about how the story should be told.

Think how many times you have been explaining something to a room full of blank faces and run to the board, grabbed a globe, asked students to get out of their seats and make a motion. All of these choices we make are part of assessment. Think how many times you have been driving home realizing you need to adjust a lesson, bring in some graphics, talk with group A. All of these decisions that you make are part of assessment.

Teachers are responsible for planning approximately 20 hours of learning time for students each week. The choices we make every day, the material we choose, how we structure the time, the way in which we design learning activities are driven by assessment. All this has to do with who we are as teachers, what it is we want to teach and how well we keep in touch with the people we are teaching. When you piece together a large interdisciplinary unit, all



these factors will drive the choices you make and become part of your ongoing assessment.

Assessment involves a multitude of assessment techniques, both formal and informal. There are many models currently under discussion in education and this chapter will not try to present them nor will it pretend to provide any final answers. Whatever hook you are hanging your hat on, whether it is Howard Gardner's theory of multiple intelligences, or Vermont's Common Core, it is you the teacher who has to decide what it is that you want to accomplish and how you will know whether you have met your goals. Thus your personal teaching

philosophy is central to assessment. How you play it out in your classroom also depends on what model of change your district is following and how much that impacts you and your classroom.

In environmental education—or in the study of anything that is as REAL as Lake Champlain is—the task of teaching and learning is more complex. The story is more complex, so the task of ascertaining whether the story is understood is more complex. A great deal of the learning task is the sharing, comprehending and mastery of material—facts, dates, statistics, dimensions of change. Some of this material is relatively straightforward to measure. But an added dimension of mastery involves decision making and an involvement of one's self and the material. Communities are currently disagreeing over whether content or values should be taught. It's not an issue of either/or—it's both. When we teach about something as important as the Lake Champlain Basin, real learning takes place and this involves the student as a whole person—not just as a recipient of information. *Learning is a human activity.*

In order to effectively assess what students are learning, I believe the following things are necessary:

- clear educational goals and philosophy
- an ability and willingness to respond to your students
- a commitment to ongoing assessment
- clear, measurable unit objectives



CLEAR EDUCATIONAL GOALS *and* PHILOSOPHY

Mary Dupont, my teammate at School Street School, while writing her master's thesis, "The Development of a Curriculum Designed to Enhance Television Literacy and Critical Thinking Skills in Middle Level Students," stated one of her philosophical goals:

"Knowledge should not be delivered by the teacher but discovered by the student, together with the teacher and peers. Students should be allowed to construct meaning through hands-on experience, research, exploration, collaboration with peers, dialogue, reflection and discussion."

A clearly stated philosophy such as this serves as a guidepost to designing learning activities. When Mary and I plan together we know this is one of our goals and we can more easily plan learning time to correspond to it. When this philosophy is clearly articulated to students and their families and apparent in the workings of the classroom, then the learners know what they are about. Clear goals facilitate the learning process because teachers and students can work together on a commonly understood purpose. It is much easier to examine whether goals have been accomplished when everyone knows what they are.

AN ABILITY *and* WILLINGNESS to RESPOND to your STUDENTS

In order to stay in touch with your students, the people to whom you are telling the story, you must be willing to change. You will have to adjust lessons to the many learning styles of your students. This involves continually reassessing your program and your teaching.

Is there a way for you to communicate with your students so you are able to know how they are doing? When you talk to a friend, you might say, do you know what I mean? In education we rarely take time to really listen to our students. When we do listen, we must be willing to pay attention and make the necessary changes.

A COMMITMENT to ONGOING ASSESSMENT

Assessment is ongoing and begins with planning. Planning the variety of learning experiences and allowing time for learning to happen are integral to the assessment process.

Do students have a clear understanding, from the very beginning, of what is to be learned and how that learning will be assessed? Are families involved in this process?

"These days, I learn in my classroom. What happens there has changed; it continually changes... and the curriculum unfolds now as my kids and I learn together. My aim stays constant—I want us to go deep inside language, using it to know and shape and play with our worlds—but my practices evolve as eighth graders and I go deeper. This going deeper is research, and these days my research shows me the wonders of my kids, not my methods."
Nancy Atwell

IN THE MIDDLE: WRITING,
READING AND LEARNING
WITH ADOLESCENTS



If one of your goals is to provide fun and exciting learning opportunities, the first step is to plan those activities. If one of your goals is for students to discuss with each other and share opinions about the material that they are learning, then it is important, and often challenging, to plan that time into your school day. We often get to an end of a unit and wonder why the students didn't grasp part of what we thought we were doing. Then we realize that we didn't provide ample time for them to process that particular aspect of the study. We may have an amorphous goal that we hope "happens as we go along" but realize too late that we have to carve out time for our priorities. This is especially true as expectations for what teachers should accomplish in the school day increase.

Have you planned in time when you will assess your progress? Do you have time to talk to students about what they are learning? To me, this is one of the more challenging aspects of our job. Planning for dialogue and interaction is critical.



CLEAR, MEASURABLE UNIT OBJECTIVES

Mastery Learning, an educational philosophy that has come and gone, left me with one important lesson that has stayed. It's so obvious yet somehow ignored: always tell your students what you intend to teach them and why. Never hold them accountable for information you haven't collectively declared. Oftentimes in interdisciplinary studies, new material is generated as you proceed. This need not "break the rules." Many times on a field trip or with a guest speaker, we generate new material. This is good—and it's okay

to learn together. Be sure to acknowledge this material together and include it in your classroom bank of information.



METHODS OF ASSESSMENT

An interdisciplinary study based on such a rich resource as Lake Champlain offers a multitude of ways for you to assess what your students are learning.

During the course of an eight-week unit, I might use any or all of the following:

- a test
- a short quiz
- factual writing
- a thinkbook response to a speaker, field trip, reading or activity
- class discussion
- homework
- essays
- creative writing
- oral presentations
- artwork
- theater
- a project for history day or science fair
- simulation
- portfolio





FORMAL ASSESSMENT

Formal assessment includes tests, quizzes and other activities that ascertain student mastery of specific material. Formal assessment allows the teacher to stop at a designated point and ask the students whether they have retained certain information and met specific unit objectives.

Identifying what this information will be is an extremely important part of formal evaluation. It is especially important with a self-designed unit of study when you can't say: "The test on Friday will be on chapters two and three." I usually have a class discussion on what students can expect on a quiz or cumulative test. Often students will surprise you by claiming responsibility for information you hadn't planned on, such as material gathered during a field trip or student presentation. The information that the class agrees on should be posted in the classroom or handed out to each student in writing. This is best done at the beginning of the unit, although important things come up during the interdisciplinary study that may be necessary to include.

Another way to guarantee a clear understanding of what learning is to be assessed is to design a study sheet with questions. Cooperative groups can then work together and use student folders and classroom resources to check and record the answers. We can then review as a class and confirm all the things that will be on the test. There shouldn't be any surprises! The process of students' claiming the material they have learned is a critical element of their success at mastery.

In the book, *ASSESSING STUDENT OUTCOMES*, the authors illustrate a variety of questions that can be used on a cumulative test. I borrowed the categories and wrote Lake Champlain questions, which are listed on the facing page.



Matching Questions: Choose the best answer and write the correct letter in the left-hand column.

- | | |
|--------------------------|---|
| _____ 1. Lake Bitawbagok | A. first inhabitants of western shore |
| _____ 2. Iroquois | B. escaped from British at Valcour Island |
| _____ 3. Benedict Arnold | C. Lake Champlain in 1500 |
| _____ 4. Otter Creek | D. southern tributary |
| _____ 5. Plattsburgh Bay | E. famous naval battle, War of 1812 |

True or False: Circle T or F.

1. T F Golf courses can be a source of pollution in Lake Champlain.
2. T F The Champlain Canal was completed in 1860.
3. T F Plankton are microscopic plant and animal life.
4. T F Zebra mussels were first found in Lake Champlain in 1988.

Completion Questions

1. The Lake Champlain Basin is _____ square miles.
2. The _____ is a tributary that flows through Milton.
3. There are _____ species of fish in Lake Champlain.
4. The _____, Benedict Arnold's gunboat, is on display at the Smithsonian in Washington, D.C.

Multiple Choice Questions

1. _____ The _____ River drains Lake Champlain into Canada.
a. Connecticut b. Lamoille c. Richelieu
2. _____ Many of the boats built during the American Revolution were built at _____.
a. Burlington b. Skeenesborough c. Shelburne
3. _____ A tributary of Lake Champlain that runs through Milton is the _____.
a. Missisquoi b. Winooski c. Lamoille

Short Essay Question

Explain to Samuel de Champlain at least three changes that have taken place on the lake since he traveled on it. Be specific and give good examples. Describe the changes so that your answer shows how much of Lake Champlain's history you have learned.

Open-ended Question

In the space below, list as many things as you can think of that you could do to protect the water quality of Lake Champlain.

Name that Fact! Write in correct information. There may be more than one right answer!

1. One famous battle fought on Lake Champlain: _____
2. One tributary in New York: _____
3. Three fish that live in Lake Champlain: _____
4. Two problems that face Lake Champlain: _____



The book, ENVIRONMENTAL EDUCATION IN THE SCHOOLS: CREATING A PROGRAM THAT WORKS, was written for use by the Peace Corps in Africa and is a wonderful resource. Judy Braus is the person who created the NatureScope science series when she worked at the National Wildlife Federation. Braus now works for the World Wildlife Fund.

INFORMAL ASSESSMENT

Informal assessment, which happens more frequently, is your way of keeping in touch with students. This is integral to your success as a teacher. Knowing how your students are processing the information is the only way you are going to know whether you have accomplished some of your most important learning goals. The following categories of informal assessment are taken from an excellent book titled: ENVIRONMENTAL EDUCATION IN THE SCHOOLS: CREATING A PROGRAM THAT WORKS by Judy A. Braus and David Wood. I borrowed the categories and wrote about how I use these learning activities in the study of Lake Champlain. The different kinds of informal assessment identified by Braus and Wood are:

- listening and recording,
- homework,
- journals and notebooks,
- research and reports,
- discussions and debates,
- peer and self-evaluation,
- portfolios.



LISTENING *and* RECORDING

Listen for, observe and record the following things happening in your classroom:

- **questioning**

“How does the water go underground and then end up in the lake?”

- **planning**

“Meghan and I were talking about the Open House and we really want to make a display on wetlands and make some really neat creatures out of cardboard. Could we look at that book you showed us yesterday with the pretty photographs?”

- **sharing**

“Do you think it would be all right if I brought in some pictures of my grandfather’s camp on St. Albans Bay? He even said he’d come to class if you want....He’s lived there since 1932.”

- **speculating**

“What if the zebra mussels hurt all the other fish and water creatures in the lake and it wasn’t the same?”

Note: *These are approximations of students’ comments that I’ve heard during the study of Lake Champlain.*



- **communicating**

“I went home and told my sister about the wrecks in Lake Champlain and she told me that Sheri’s mother was a diver and she had found a pot that was thousands of years old and it is now on display at the Maritime Museum.”

- **expression**

“I really liked what we did in class yesterday when we built a watershed. Wasn’t it cool when the water turned colors?”

- **listening**

It’s silent, but you can see it when they are listening to each other!

- **behavior**

“Weren’t we great on our field trip yesterday! We are awesome!”

- **participation**

“Everybody worked hard in the cooperative groups today, even ___ who hardly ever listens!”

Aside from the many ways that you can watch to see if your students are learning, you can also measure this systematically if you have a particular objective. Below is a chart that Braus and Wood suggest:

*Jason Pariseau’s story about the **General Butler** reflects a profound element of learning. Jason, who usually did not choose to write long pieces, wrote the story of the wreck of the **General Butler** after a trip to the Lake Champlain Maritime Museum. He had **heard** the story from Don Wickman, our tour guide, and he had **listened**. No research. No notes. I asked the class to write a piece titled “A Time in History,” choosing an image from the trip that meant something to them. By listening and learning Jason now had this story as one of his own.*

| | participates in discussion | gives creative responses | works well with others |
|--------------|-----------------------------------|---------------------------------|-------------------------------|
| CARLA | | | |
| TOM | | | |
| JOEY | | | |
| SARAH | | | |

There are a multitude of other ways that we keep in touch with our students and assess how they are doing. These are the many learning activities that we plan into our program to meet our goals.



*“My science paper will be on frogs.
I think. I need your help!”
Fifth-grade student*



Projects that are linked to research and inquiry are valuable ways for students to express their learning. Tai Dinnan, author of “Our State Fossil,” displays her model of the Charlotte Whale.

HOMEWORK

Homework is an important indicator of your students’ involvement in the work and the success of the program. It is important to assign it consistently and check it thoroughly. It can help you understand what they are learning and what they are interested in.

I am sure that there is a mathematical correlation between the effort students spend on homework and the time the teacher takes to review it. Whenever I feel homework slacken, I look at myself first. Time in class to share and acknowledge what was done is important. Too often we move onto the next task or topic.

I include homework success as part of the grade. Ten percent of their grade in every subject reflects homework completion. This is particularly important in the middle grades when students are adjusting to the amount of homework that they are given.

JOURNALS *and* NOTEBOOKS

For me, the thinkbook (see *Getting Wet*, p. 5) is an important tool for keeping in touch with how students are processing the material. One of the ways I can tell when we are really “cooking” is when we have 100% completion of thinkbook entries. I make a big deal of this when it happens.

Since I cannot collect and grade 24 thinkbooks every day (maybe in my next life!), I take a few minutes of class time each day to check for completion. I ask students to open their books to last night’s homework, then proceed around the class (no time for conversations, it’s done or it isn’t—if someone has a good reason, he or she knows to talk to me before the day begins) and make a star or a frowny face on the page. I collect and read them once a week to make comments and assess the content of their writing. This is a wonderful time for me to have those “conversations” that there is never time for! Their homework completion grade is averaged in with the final thinkbook grade.

RESEARCH *and* REPORTS

Doing research and reports is an important way for students to learn research skills. Learning to analyze information, document facts, distinguish facts from opinions and organize information are important critical thinking skills for middle grade students.



I have emphasized what I believe are key ingredients for successful research projects in the *Research and Inquiry* chapter, in a section called “Keeping in Touch.” (See *Research and Inquiry*, p. 312.)

DISCUSSIONS and DEBATES

An essential element of the development of stewardship is not only learning information about the lake but developing opinions and learning to express them. Students need opportunities to practice formal and informal expression. Role plays, skits, debates, class discussions, and problem solving in small groups can give students chances to think about and form opinions on the complex issues surrounding the lake.



PEER and SELF-EVALUATION

Students should have the opportunity to talk about their work and get support and feedback from their peers. It is important to deliberately create time for this. Sometimes it is as simple as: “*Turn to the student next to you and tell him or her five things you just learned from our discussion.*” It can be done more systematically at the end of an important learning activity. It is a main ingredient in cooperative groups and can also be used formally in evaluating writing.

On the next page is a sample of a formal peer evaluation used for a student’s write-up of an interview.

PORTFOLIO

As with all units of study, I find it valuable to have students organize their final work into a finished folder. The process involves organizing and reviewing the work, making choices about what to include and evaluating one’s own learning. My students make a small book with a table of contents and a decorated cover. For those of you involved in the Vermont portfolio process, a Lake Champlain study offers a wealth of work to include. Students’ written evaluation of the unit and their work should be included in the final portfolio.

“I am very proud and surprised at all the work I have done this year. I never thought that I could improve my writing. I never thought that I could write so much. I am very happy with myself.”

Colleen Robie, Grade 5, Milton

AUTHOR _____

EDITOR _____

Interview Write-up Conference Sheet

Did the author include the following:

Introduction to report

- _____ Name of interviewee
- _____ Date of interview
- _____ Location of interview
- _____ Explanation of what the interview was about

Main section of report

- _____ Clear presentation of information
- _____ One or two quotes, or some way to get an idea of the character of the interviewee.
- _____ Good organization of the information

Conclusion to report

- _____ Opinion, what they liked best about the interview, or what they found interesting
- _____ Other method of wrapping up your topic

G.U.M. (Grammar, Word Usage, Mechanics)

- _____ Complete sentences
- _____ Capital letters at beginnings of sentences and with proper names
- _____ Correct spelling
- _____ Correct punctuation marks
- _____ Words used correctly
- _____ Are you able to read the work without guessing what it says?
- _____ Is the report the student's best effort in grammar, usage, mechanics?

Other comments

- _____ Did the author give enough information?
- _____ Did you learn anything?
- _____ What else would you like to tell the author?

Credit: Carol Livingston. Used with permission.



ASSESSING WRITING

In addition to the categories identified by Braus and Wood, I am adding my own emphasis on the assessment of writing. This section will briefly outline some aspects of assessing writing that I think are important.

When I assign an extensive piece of writing, I do the following:

- design the writing assignment with the class,
- identify key elements to the writing piece we are undertaking,
- assign scoring points to the different elements of the writing piece,
- establish deadlines for the first and final drafts.

Below is an example of a scoring sheet that I will develop with my class; the same scoring sheet will be used to evaluate the first and the second draft with higher expectations on the second draft.

On the next page is an example of a scoring sheet that is a self-evaluation process, which Carol Livingston uses when students complete the soldier's journal. (See "Writing Journals" in *Language Arts*, p. 237.)



Any rubric that will be used to score a piece of writing should be shared at the beginning of the writing process.

Trip Around Lake Champlain

| | | |
|--------------------|---|----------------------|
| First Draft | Due: _____ | |
| | Historically accurate (<i>includes historically-accurate details</i>) | 50 pts _____ |
| | G.U.M.: Grammar | 10 pts _____ |
| | Usage | 10 pts _____ |
| | Mechanics | 10 pts _____ |
| | Good story (<i>makes sense, is about Lake Champlain, fun to read</i>) | 20 pts _____ |
| | | 100 pts _____ |
| Final Draft | Due: _____ | |
| | Historically accurate | 50 pts _____ |
| | G.U.M.: Grammar | 10 pts _____ |
| | Usage | 10 pts _____ |
| | Mechanics | 10 pts _____ |
| | Good story | 20 pts _____ |
| | | 100 pts _____ |

Lake Champlain Soldier's Journal Evaluation Form

Content And Details (50 pts)

You have accurately completed three journal entries that show what life was like for a French soldier stationed at Fort St. Frederic or a British soldier at Fort Crown Point. You have included:

- ___ dates and locations of entries,
 - ___ setting: fort, land, lake, wildlife,
 - ___ what you see, hear, smell, feel,
 - ___ how and where you travel,
 - ___ what, how, where you eat and cook,
 - ___ where, with whom you live, furnishings,
 - ___ how you spend time: work, leisure, use of tools,
 - ___ what worries, hopes, concerns you have.
- _____ pts

Organization (20 pts)

Your entries each have some form of introduction and conclusion that help the reader follow your purpose listed above. You have connection between paragraphs.

_____ pts

Voice/Tone (10 pts)

Your entries show your character's "voice." We can "hear" the opinions, feelings and viewpoint of this character.

_____ pts

Editing (10 pts)

Your entries have been edited for: spelling, punctuation, correct verb tense, capitalization, complete sentences, I-topic paragraphs.

_____ pts

On Time (10 pts)

All drafts were turned in on time. The final is neatly written in cursive or is typed.

_____ pts

_____ TOTAL POINTS

Evaluation: I believe my Soldier's Journal merits a grade of _____ because _____
_____.

Teacher comments: _____



The scoring sheets are cover sheets for any drafts that are handed in, and they serve as a basis for writing conferences. It greatly facilitates the writing process.

If you are exploring a particular genre with your students and wish them to include the specific elements of this genre, such as a folktale, assign points to each element. For example, if you are writing folktales, you might include:

- animals,
- a long time ago,
- a lesson or explanation of the way things are,
- on the lake.

A rubric is a particular kind of scoring sheet that is now used more frequently by educators. A rubric clearly defines levels of competence. Below is the rubric used in the Vermont writing process. It can be used successfully with any piece of writing as it includes the key elements of good writing.

Teachers who are using the Vermont Writing Process are finding ways to meld writing expectations that are particular to their curriculum with the writing rubric used to develop writing portfolios.

In my experience with scoring sheets, if you are working with 25 points as the maximum number of points, it is clear to the student that 20 points is adequate, 15 is poor and so on. Whichever you use, the important thing is that you have a tool to clearly communicate and agree on expectations and to measure results.

| WRITING | RARELY | SOMETIMES | FREQUENTLY | EXTENSIVELY |
|--|---|--|---|--|
| Purpose | <i>Purpose and focus not apparent</i> | <i>Attempts to establish a purpose; focus is not clear</i> | <i>Establishes a clear focus and purpose</i> | <i>Establishes and maintains a clear focus and purpose</i> |
| Grammar Usage Mechanics | <i>Errors interfere with understanding</i> | <i>Numerous errors</i> | <i>Some errors</i> | <i>Few or no errors</i> |
| Voice or Tone | <i>Numerous errors</i> | <i>Attempts personal expression or tone</i> | <i>Established personal expression or effective tone</i> | <i>Distinctive personal expression or tone enhances writing</i> |
| Organization | <i>Writing difficult to follow</i> | <i>Lapses in unity and coherence</i> | <i>Few lapses in unity or coherence</i> | <i>Logical progression of ideas; fluent</i> |
| Details | <i>Few details; random or inappropriate</i> | <i>Details lack elaboration, merely listed or unnecessary repetition</i> | <i>Details are elaborated or develop ideas or information</i> | <i>Details are pertinent, vivid or explicit and provide in-depth information</i> |



ASSESSING ENVIRONMENTAL EDUCATION

In addition to the elements of assessment mentioned already, environmental education invites some particular methods of assessment. Teachers in the basin are designing many new ways to assess student learning that takes into account the many dimensions of environmental education.

The XStream, a seventh-grade interdisciplinary team at Missisquoi Valley Union Middle School, uses a Water Log to document their year-long study of water. This Water Log is an ongoing assessment of student work. A three-ringed binder has sections that include:

- pre-study information—pretests on opinions, values, facts and predictions,
- journal entries—observations, poems, short stories,
- reference and unit materials.

On “Water Friday,” which occurs every other week, students are divided into small groups and engage in water-related activities and water testing on the Missisquoi River. Students enter information in their Water Log as part of the day’s activity. Each student is responsible for organization and maintenance of his or her Water Log. Once a month, students evaluate the order and contents of the materials in their own Water Log. A brief checklist and

narrative evaluation are completed by each student and are placed in the Water Log and read by each teacher. At midterm exam time, students complete a written evaluation of their Water Log and it is attached to their report as an addendum item. During a culminating event, “Water Day,” students participate in an oral interview as a review of the year.

In 1995, the XStream Team consisted of Gary LaShure, Alan Fletcher, Monica Kelly and Dale Paul.



One of the tools the XStream Team uses is a Pre/Post Test. On the first/last Water Friday of the year, the students are given the Pre/Post Test and results are compared.

Pre/Post Test

Values

1. If a sewage treatment plant was going to be built in your neighborhood, would you fight it or accept it?
a. fight b. accept
2. If you caught a 10-inch trout, would you eat it or let it go?
a. eat b. release
3. Water is
a. an important resource, b. a great danger sometimes, c. an important historical factor.

Predictions

1. At the end of October, the temperature of the Missisquoi River is about _____ °C.
2. If you were to walk out to the middle of the river near Marble Mill, how deep would it be?
3. (MORE or LESS) than half of the community is concerned with water quality.
(Underline your answer.)
4. Do you think that (MORE or LESS) than half of the community thinks that the Missisquoi River is in good shape? (Underline your answer.)

True or False

1. _____ Dissolved oxygen is not important.
2. _____ You can tell the quality of water by the amount of insects in it.
3. _____ You can tell the quality of the water by its temperature.
4. _____ The pH is an indicator of the acidity or alkalinity of water.
5. _____ A liquid with a pH of 7.0 indicates an acid.

Opinion (Answer Yes or No)

1. _____ Is water quality an important issue to you?
2. _____ Is water quality an issue that should concern everyone ?
3. _____ Should people like yourself be active participants in preserving water resources?
4. _____ Should all types of people help preserve our water resources?
5. _____ Is water our most important natural resource?



“I think that if you love something you will take care of it. Because that’s what love is.”

*Amanda Boone
Grade 5, Milton*



author exploring for fossils at Button Bay State Park

End Note from a Lake Lover

In the introduction, “Why Teach Kids About Lake Champlain,” I stated that the primary objective of this learning experience is stewardship. How then do we teach stewardship? And a question that is even more difficult to answer—how do we know if we have succeeded? I can’t honestly say that I can answer that question! But I do know that stewardship is fostered by a child’s knowledge of the lake. In knowing many things about the lake, one learns to appreciate it.

When Robbie wrote in his letter, “*I love the lake. If people loved it as much as I do, the lake wouldn’t have all the pollution,*” he suggests that a love of the lake will spur a desire to take care of it. That’s stewardship! My goal as an educator is to generate the learning of information and hopefully make it possible for students to build a personal connection to the lake. This connection, I believe, is what will ensure the lake’s protection for generations to come.

Most students already know something about Lake Champlain or have a connection to lake-related activities. Most students have been there, or you will hopefully get them there. While students are learning about it they will be able to imagine it and relate to it in ways not possible with many of the things we teach.

In my introduction, I said that teaching about the lake has been fueled by my own passionate love of the lake. It is not a requirement that all my students feel this way, but a lot of excitement, pride and interest is generated by learning about THEIR lake.

Understanding its historical importance, its ecological vulnerability, its role of providing homes for waterfowl, its importance in maintaining the diversity of life forms—this grows from information that they have learned in the classroom. A rich interdisciplinary study of Lake Champlain gives the student a chance to develop respect for the lake and all its complexities.

Part of the task of assessment is to ascertain whether they have mastered information. They will know more than most residents of the basin and be proud of it. The mastery itself generates a lot of excitement.



EXCITEMENT is a pretty important thing. It is the glue between the information that students master and what they might do with that material as concerned citizens. (What exactly is being glued together? The information and the SOUL!)

- Shall the town build a 600-slip marina that will destroy wetlands?
- Will they respect the nesting needs of birds that build their homes on the shores of Lake Champlain's islands?
- Will they make the effort to clean boat propellers to ward off further infestation of exotics?
- Will they vote to fund historic preservation efforts as Lake Champlain becomes an historic corridor?
- Will they work to protect a farmer's pasture in Isle La Motte that contains ancient marine fossils?

You have no control whether your students will vote in 15 years or whether they will remember that zebra mussels filter feed. But you do have tremendous control over the learning activities you choose for your students and how much excitement those activities might generate. How do you create a classroom where kids learn a lot and are excited? I think it has a great deal to do with the extent to which you offer them the opportunity to make a connection. Hopefully this book has given you some ideas! When students are allowed to make a real connection, that connection stays with them and can influence the kind of citizens they become.

In the late 1980s, Ann Swanson, who ran the Chesapeake Bay Commission, spoke to a group of environmentalists, scientists, citizens and officials who were meeting to create an interstate system to manage the cleanup of Lake Champlain. Swanson decided to skip her opening remarks about the logistics of how things worked for the Chesapeake Bay and said what it was she believed would secure a future for Lake Champlain:

“In the end, people’s love of the lake will make it or break it,” she said, saying her Chesapeake Bay Commission relies on these same grassroots stirrings to build the political base for its stewardship of the great estuary between Maryland and Virginia. ‘It has to be more than an ecological commitment,’ she said. ‘It has to be a gut-level commitment. It has to be people who love the lake....’”

It is, after all, the love of the lake that is central to what this learning experience is all about. Have a wonderful time!

“From when I was a little kid, the only thing I really wanted to be was a scientist, to actually do the science, to interrogate nature, to find out how things work. That’s where the fun is. If you’re in love, you want to tell the world!”

Carl Sagan

Quote from Addison County Independent, November 9, 1989.