

Lamoille River Ecology Unit

Essential Questions:

Is the Lamoille River healthy?

How do people impact the health of a river?

How do people impact quality of wildlife habitat?



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Lesson 1: The Lamoille River and Our Community

Essential Question/Rationale: Is the Lamoille River healthy?

How do people impact the health of a river?

How do people impact the quality of wildlife habitat?

Focusing Question(s): How do we use the river? What stories can our community tell us about the Lamoille River and how it has changed over time? How does science play a part in fishing?

Standard(s):

Sustainability

3.9 Students make decisions that demonstrate understanding of natural and human communities, the ecological, economic, political, or social systems within them, and awareness of how their personal and collective actions affect the sustainability of these interrelated systems.

Understanding Place

4.6 Students demonstrate understanding of the relationship between their local environment and community heritage and how each shapes their lives.

The Living World: Interdependence of all systems

7.13.ccc. Describe, model, and explain the principles of the interdependence of all systems that support life.

Length of time needed to complete: 2.5 45-minute classes

Age Group/Class: 9th grade biology class

Resources/Materials:

Demarest, Amy B. [This Lake Alive: An Interdisciplinary Handbook for Teaching and Learning about the Lake Champlain Basin.](#) Shelburne, VT: Shelburne Farms, 1997.

Lamoille River Anglers Association. Contact: Sumner Stowe at the Fly Rod Shop, P.O. Box 960, Stowe, Vermont. (802) 253-7346. www.flyrodshop.com

Sharrow, Gregory and Helen Freismuth. [Hook, Line and Sinker.](#) Vermont Folklife Center. 2002 CD player (optional)

Procedure:

Class One:

1. Lead a discussion about the name of our high school (Lamoille Union High School). Brainstorm other things with similar names in our community and why so many things are named after the Lamoille. What does that tell us about our community?

2. Write the focusing questions on the board and have students free-write for five minutes. Share ideas and list on the board. Pull out of their response:

- Where will the story come from?
 - People – interviews

3. The rest of class period will be used to brainstorm possible interviewees and to develop interview questions. (See Hook, Line, and Sinker, Ch. 1 for ideas)

Homework: Students are to survey at least three friends or family members and determine how they use the river and how the river has changed over time.

Class Two:

1. Class discussion: What are the key points that you discovered from your research? What do you think is important for the next generation to know?

2. Introduce your guest speaker from the Lamoille River Anglers Association. (If unavailable, use the excerpts from Hook, Line, and Sinker.) Give the students the “what to listen for” prompts beforehand to help guide their note taking and questioning.

Homework:

Students will summarize their research by creating a visual representation (pretty picture) for each key point on an 8.5” x 11” piece of paper. Important dates and facts should be included, but the emphasis should be on visual representation.

Class Three

1. On a clothesline hung across the room, students should hand up their pictures.

2. As a class, synthesize the key points of the interviews and introduce the essential questions for this unit:

Is the Lamoille River healthy?

How do people impact the health of a river?

How do people impact the quality of wildlife habitat?

3. Give an overview of the unit’s objectives and some of the activities that they’ll be participating in.

Homework: Students need to have field work permission slip signed by a guardian.

Assessment:

1. On what criteria (based on standards) will you base the assessment?

What will students learn? Are there additional criteria that you will also assess such as neatness, bibliography that are not based on standards?

Exploration of human dependence on river systems
Explanation of human impact on river systems
Exploration of current and historical land use

2. What are students going to do to show you what they learned?

Selected Response

OR

Constructed Response: Short Answer Product Performance

PRODUCTS: Completed survey and research visual aid

3. What tool/scoring guide/reference point will you use to measure their progress?

Answer Key Checklist Generalized Rubric Task-specific Rubric

4. How will you communicate back to them how they are doing?

Comments and feedback will be written on copies of the check-list.

Lesson 2: River Observations

Essential Question/Rationale: Is the Lamoille River healthy?

How do people impact the health of a river?

How do people impact the quality of wildlife habitat?

Focusing Question(s): What makes a stream a stream? How can we use and improve our observation skills in order to see better?

Standard(s):

Sustainability

3.9 Students make decisions that demonstrate understanding of natural and human communities, the ecological, economic, political, or social systems within them, and awareness of how their personal and collective actions affect the sustainability of these interrelated systems.

Understanding Place

4.6 Students demonstrate understanding of the relationship between their local environment and community heritage and how each shapes their lives.

The Living World: Interdependence of all systems

7.13.ccc. Describe, model, and explain the principles of the interdependence of all systems that support life.

Length of time needed to complete: 2 45-minute classes

Age Group/Class: 9th grade biology class

Resources/Materials:

Dillard, Annie. *A Pilgrim at Tinker Creek*. New York, NY: Harper & Row Publishers, 1974.
Medical kit, hand lenses, and clip boards

Procedure:

Class One: (in classroom)

1. Read selected passage from Annie Dillard's *A Pilgrim at Tinker Creek*. (p 5-6).
2. Stop before Dillard explains the Giant Waterbug phenomenon. Ask students to take out a journal and ask them to jot down four things that they remember from the excerpt. Then ask them to write down what they think has happened.
3. Read the rest of the passage and ask students to compare their responses with the "answer."
4. Compare this piece of writing to The Scientific Method. What are the observations, the hypothesis, research, and conclusions?
5. Introduce journaling assignment and criteria:

- Observation of local place
- Evaluation of river characteristics

6. Distribute hand-out and review academic, safety, and behavior expectations for site visit.

Class Two: river site visit

1. Travel to the river. (ten minute walk)
2. Students will spend ten minutes observing in a quiet place, within eyesight. Record observations/sketches on journal handout.
3. Discuss observations of biotic and abiotic components of the river ecosystem.
4. Travel back to school.

Homework: Read "Rivers" in the Nature of Vermont, pages 123-133 and answer the attached questions.

Assessment:

1. On what criteria (based on standards) will you base the assessment?

What will students learn? Are there additional criteria that you will also assess such as neatness, bibliography that are not based on standards?

Use of different reading strategies

Observation of local place

Explanation of the relationship between rivers, watersheds, and the water cycle

2. What are students going to do to show you what they learned?

Selected Response

OR

Constructed Response: Short Answer Product Performance

PRODUCT: Journal

3. What tool/scoring guide/reference point will you use to measure their progress?

Answer Key Checklist Generalized Rubric Task-specific Rubric

4. How will you communicate back to them how they are doing?

Comments on checklist.

Lesson 3: Riparian Zone Investigation

Essential Question/Rationale: Is the Lamoille River healthy?

How do people impact the health of a river?

How do people impact the quality of wildlife habitat?

Focusing Question(s): Which organisms live in the riparian zone on the Lamoille River? What is the ecological role of these organisms? What are some effects of changes in riparian zones?

Standard(s):

Sustainability

3.9 Students make decisions that demonstrate understanding of natural and human communities, the ecological, economic, political, or social systems within them, and awareness of how their personal and collective actions affect the sustainability of these interrelated systems.

The Living World: Interdependence of all systems

7.13.ccc. Describe, model, and explain the principles of the interdependence of all systems that support life.

Length of time needed to complete: 2 45-minute classes

Age Group/Class: 9th grade biology class

Resources/Materials

a variety of art materials; nature magazines for photos; books of reference about riparian habitats and wildlife; medical kit; hand lenses; and clip boards

Council for Environmental Education. Project WILD Aquatic. Houston, Texas. 2001.

Procedure:

Class One: (in classroom)

1. Complete the first portion of "Blue Ribbon Niche" from Project WILD Aquatic for the same section of the Lamoille River that you have previously visited.

2. Review academic, safety, and behavior expectations for site visit.

Class Two: River Site Visit 2

1. Travel to the river. (ten minute walk)

2. Complete the second portion of "Blue Ribbon Niche" Include the optional activity in #10—having the students list evidence of animal life in the riparian zone.
3. Have the students gather their art and travel back to school.

Homework: Students are to write a summary of what they have learned about niche, habitat, and riparian environments. Also, include a comparison of the similarities and differences between the diversity of animals they actually find evidence for and the diversity they represented in their drawings of animals.

Assessment:

1. On what criteria (based on standards) will you base the assessment?

What will students learn? Are there additional criteria that you will also assess such as neatness, bibliography that are not based on standards?

Observation of local place

Understanding of habitat requirements

Explanation of human impact on river systems

Comparison of the availability of natural resources and the impact of different management plans within the management area

2. What are students going to do to show you what they learned?

Selected Response

OR

Constructed Response: Short Answer Product Performance

PRODUCT: Summary

3. What tool/scoring guide/reference point will you use to measure their progress?

Answer Key Checklist Generalized Rubric Task-specific Rubric

4. How will you communicate back to them how they are doing?

Comments on checklist.