



My Water, Your Water, Our Water

Model K-12 Service-Learning Lessons

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Overview

The Great Lakes Basin provides a wealth of material to develop English language arts, science and social studies skills, while exposing learners to aspects of philanthropy and stewardship. Learners explore how waterways became polluted and participate in meaningful activities to test water using the scientific method. The lesson emphasizes the role of individuals, business, industry, government and the non-profit sector in reducing pollution and cleaning our waterways. After studying and testing water quality in a nearby water source, learners will compose and send letters to government representatives and nonprofit foundations or agencies supporting efforts to reduce pollution. Learners will discover individual and collective responsibility for maintaining the health of the Great Lakes Basin and will demonstrate knowledge and awareness of the importance of the Great Lakes, their respective ecosystems, and citizen responsibility to protect the waterways.

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Lesson Plan Information

Title: My Water, Your Water, Our Water

Grade level(s): 3-5

Subject area(s): Language Arts, Science, Social Studies, and Philanthropy

Standards addressed:

- English Language Arts (expository text; research; letter writing; persuasive techniques; writing mechanics)
- Science (conservation; ecosystems; water; natural resources; pollution; data collection/organization; environment; evidence; experiment; natural world)
- Social Studies (choices/consequences; citizenship/civic engagement; civic responsibility/virtue; community capital; diversity; environment; ethics; geographic features; adaptation; common good; ecosystems; geographic features; industrialization (1800-1900); ethics; government; inquiry)
- Philanthropy (environmental stewardship; stewardship; advocacy; commons; foundations; nonprofit sector; service project)

Objectives:

The learner will:

- Analyze content of the reading book, *A River Ran Wild*.
- Apply knowledge gained from the reading to the Great Lakes.
- Identify citizen responsibility for the Great Lakes Basin.
- Understand the concept of community capital as applied to Great Lakes Basin.
- Identify reasons for maintaining water quality.
- Demonstrate use of vocabulary associated with water quality.
- Locate his/her nearest river, pond, lake, reservoir.
- Demonstrate knowledge of physical geography of the Great Lakes.
- Analyze the effects of settlement and development on the Great Lakes Basin.
- Identify major causes of pollution in the Great Lakes and its tributaries.
- Successfully demonstrate vocabulary of philanthropy and stewardship.
- Connect the concept of stewardship to the study of the ecosystem of the Great Lakes Basin.
- Assess the effects of industry and settlement on the Great Lakes.
- Prepare a class presentation on a Great Lake, its ecosystem and volunteer efforts to improve the basin.
- Conduct an experiment using the scientific method and report findings in water quality.
- Design and participate in a service-learning activity.
- Practice effective reflection.
- Evaluate the service activity.
- Understand the role of the non-profit sector in helping preserve the waterways.
- Apply the concepts of philanthropy and stewardship to the preservation of the Great Lakes Basin.

Time needed for completion:

- Phase One: 10 forty-five minute class periods
- Phase Two: 15 forty-five minute class periods
- Phase Three: 15 forty-five minute class periods; additional time, as needed for transportation for water quality testing.

Materials needed:*Phase One*

- Book - A River Ran Wild (see Bibliographical References)
- Video- Outside Television: "The Hudson Riverkeepers"
- Lakes Agreement Information Kit, provided at no cost by International Joint Commission: Great Lakes Regional Office (www.ijc.org). Kit includes a pamphlet on "What the IJC is and how it works," a bibliography of IJC reports under the Agreement, a brochure on toxic substances and on the Remedial Action Plan program, posters on "Our Fragile Ecosystem" and on RAPs, Water Quality and Water Quantity.
- District and/or school science texts appropriate for grade level: sections on water quality, pollution, and conservation of water
- Journals
- Large map of the Great Lakes
- Poster board or large sheets of paper
- Markers, colored pencils or crayons
- Attachment One: Guided Practice
- Attachment Two: Fishing for Facts

Phase Two

- Markers
- Colored pencils
- Notebooks for journals
- Poster Board or large sheets of paper
- Map of the Great Lakes region
- Water: Keeping Water Clean by Helen Frost (see Bibliographical References)
- Attachment Three: School/Home Connection Letter to Parents
- Attachment Four: What Can I Do?
- Attachment Five: Situation Cards

Phase Three

- Tissue or shoe boxes, enough for one for each peer group
- Sheets of plain paper to use for covering the boxes
- Markers, pencils or crayons
- Water quality testing kits
- Word processing software for letter writing
- Attachment Six: Cubing
- Attachment Seven: My Experiment
- Attachment Eight: Sample Letters

Teacher Preparation

Due to the technical nature of the content on water quality and the Great Lakes Basin, it is recommended that the instructor use the following websites to become familiarized with the content.

- Great Lakes Sea Grant Network. <http://www.greatlakesseagrant.org/>. This Web site will help the instructor to become familiar with the Great Lakes Water Quality Agreement. Also found here are excellent articles on the introduction of non-indigenous species introduced into the lakes such as the zebra mussel.
- Environment Canada [Ontario] Great Lakes Water Quality Agreement. <http://www.on.ec.gc.ca/glwqa/sht-history-e.html>. This site has information about the history of pollution in the Great Lakes Basin and what is currently being done about it and includes references to other resources.
- National Geographic Maps. www.nationalgeographic.com/mapmachine This Web site has downloadable maps for student use. Obtain from your local library, media center or Public Broadcasting System the VHS produced by Outside Television entitled, "The Hudson Riverkeepers" by Robert Kennedy et al. (1998).
- U.S. Geological Survey. http://interactive2.usgs.gov/learningweb/explorer/topic_water_links.asp. Source for water glossary terms (<http://water.usgs.gov/nawqa/glos.html>), activities, maps, and other resources.

Field trip preparation

- Prior to taking learners on a field trip to the nearest lake, river, stream or pond, secure water quality tests, one for each peer group, and obtain school, district and parental permission. Arrange for chaperones and transportation. This preparation should begin at least two weeks prior to the activity. Provide collection bags for each peer group to collect litter at the site.
- Alternative to field experience: Conduct water quality tests on drinking fountain water samples and water that the instructor has obtained from the local pond, river, lake or stream. If your local elementary or primary unit does not have microscopes, contact the local high school or curriculum laboratory to borrow needed equipment.

Service-Learning Components

Investigation

Phase Two

- Ask learners to use the Internet to conduct research about the Great Lakes and produce a map of the Great Lakes. Have each group collect information relating to their lake on themes of geography, such as: location; culture, ecosystems, communities, natural and human characteristics; interaction between humans and environment; movement, including elements of industry, trade, transportation, and urbanization; and region.
- Ask learners to use the Internet to learn about programs of stewardship that protect the Great Lakes.
- Have students identify a local organization whose mission is focused on water quality and explore options for collaboration between the school and the organization to test local water sources. Explore options for obtaining water testing kits and the potential of partnerships with local organizations.

Phase Three

- Have the learners use the media center or library to identify their local, state and federal government representatives. Ask learners to obtain names and contact information for each representative and to examine voting records to determine the conservation record of each representative.
- Help learners use the Internet to identify additional nonprofit groups and organizations, which help protect the waterways. Use www.Guidestar.com to locate philanthropy organizations in your area involved with water conservation efforts. Use the advanced search, enter Great Lakes, pollution or water. Some of the foundations that may be found in those searches include: Center for Environmental Studies, Grand Rapids, MI; Defender of the Great Lakes, Houghton, MI; Environmental Association for Great Lakes Education, Duluth, MN; We Are Here Foundation, St. Clair Shores, MI

Preparation

Phase One

- Use a large map that shows the Great Lakes. Ask the learners why these lakes are so important and make a list of the responses. Ask the learners if they know the definitions or give examples of pollution and conservation and how they can relate these terms to what they already know about our lakes, rivers and streams. Read and discuss Attachment Two: Fishing for Facts, as a class. Tell them that the true story they are about to read, *The River Ran Wild*, will describe how a once great, clean river became polluted and how Marion Stoddard and others practicing philanthropy helped save the river.
- Read the book, *The River Ran Wild*
- Define terms appropriately, including: ecosystem, pollution, estuaries, conservation, water quality, philanthropy, stewardship, community capital, selfish, selfless.

- Have the learners complete Attachment One: Guided Practice to accompany the reading. Take home for parents to view and if needed, learners may complete at home.
- View the video, "*The Hudson Riverkeepers*," and have the learners compare how the Nashua River was cleaned and how the Hudson River is being cleaned. Make certain that the learners discuss the examples of stewardship and public action for the common good.

Phase Two

- Divide learners into peer groups of three to four per group. Give each learning group a large sheet of paper with the following acronym on the top, "H.O.M.E.S." Have each group answer the following: using the letters as clues, what are the names of the Great Lakes? How do they get their drinking water into their houses? If they were very thirsty and they were at a lake in their state, and the family had forgotten to bring drinks, would they drink the water in the lake? Why or why not? What is the name of a river or lake that is close to the school? What are ways they can keep the water clean? Bring the class together and have each group designate one member to report to the class. Record the most frequent responses on a large sheet of paper.
- Show the video entitled "The Great Lakes: Fragile Seas." National Geographic Society Educational Services. ISBN 0-7922-1909-0
- Read the story, ***Keeping Water Clean***.
- Have learners discuss what they learned from the ***Keeping Water Clean*** story that could relate to keeping the Great Lakes and nearby waterways clean.
- Have learners form five cooperative groups. Pass a paper bag and have each one draw a name of a Great Lake. *Note: Sometimes it is helpful to allow two minutes to trade and bargain with other groups to finalize the lake each one researches.*
- Collaborate with staff from the local organization to establish a plan for testing local water sources.

Phase Three

- Form cooperative groups for learners to complete the cubing activity. The activity asks learners to look at concepts or processes from several points of view and is designed to help them think more critically about the uses of the Great Lakes and the erosion of the ecosystems that arise from it. Encourage learners to use information they collected through their Internet research to answer questions. Ask learners to fill out Attachment Six: Cubing and use a caption or drawing to briefly represent their answer to the following questions: **Describe it:** What are the Great Lakes? Look for place, name, and location as themes of geography. **Compare it:** What is it like? Is it like anything else you know of? What is different or the same? **Associate it:** What does it remind you of? **Analyze it:** What are the Great Lakes made up of besides water? What kinds of pollution exist in our lakes? **Take a stand:** How can we help our lakes get better? How are our lakes used and by whom? **Argue for or against it:** List reasons why we should or shouldn't try to clean up our Great Lakes Basin.
- Discuss with the learners the role of government in protecting the Great Lakes ecosystem.

Action

Phase Three

- Conduct an experiment with water to show how easy it is to pollute it and how difficult it is to clean it up. See Attachment Seven: My Experiment which is to be completed by each group.
- Use the information gathered in Phases One, Two, and Three to write letters to one Congressman or Senator and a foundation or nonprofit organization about the importance of preserving the Great Lakes ecosystems and encourage them to support programs and laws that are friendly to our environment or to continue their work on environmental issues. Each group is to write letters supporting legislators' past voting records, if applicable, and encouraging a course of action. Nonprofits should be encouraged to fund environmental causes and perhaps be asked for suggestions on how the learners can get involved in further service activities. It is recommended that third grade learners write two letters, one from A-C (below) and a second to a nonprofit organization. Fourth grade learners should be able to write three letters and all four should be written at the fifth grade. See Attachment Eight: Sample Letters.
 - A. To their state Representative or Senator
 - B. To the United States Senator from their state
 - C. To their own U.S. Representative
 - D. To a nonprofit organization involved in protecting the Great Lakes
- Use peer group editing techniques to draft and revise the letters.
- Conduct the philanthropic service project(s) identified in Phase Two to address issues facing a nearby lake or river.
- Have learners draft a letter to representatives of all community partner organizations working with them on the service project, soliciting feedback on the quality of their work and its impact.

Reflection

Learners are to participate in reflection prior to service, during service and after service is completed. A picture journal is an excellent way for learners to react to a key word the instructor gives from content and philanthropy at each stage of the activity. Learners may keep these reflections in a journal or scrapbook. Another suggestion is to have each group post a very large sheet of paper in the classroom and record their activities and reflections each day. Letters from the foundations, senators, representatives and others should be collected and placed in a display area.

Phase One

- Discuss the following questions after reading the book, *The River Ran Wild*: How does a river change over time? Are these changes good or bad? What factors did we discover about the Nashua River that we could see happening in the Great Lakes? Why do you think Marie felt that it was her responsibility to act philanthropically and accept stewardship for the river?
- Form cooperative groups and discuss how the concepts involved in stewardship and philanthropy can be connected to the saving of our Great Lakes ecosystems.

- Discuss the responses that learners wrote on Attachment One: Guided Practice. Come to consensus with the class on each response.
- Ask learners to complete Attachment Two: What Can I Do? This activity helps them to explore ways in which they can put their ideas into action.

Phase Two

- Ask the learners to write a reflection paragraph on what they have learned from the "*The Great Lakes: Fragile Seas*" video. Included should be what problems were identified, how they feel about the problems identified, and what they hope to learn in order to be of help to the Great Lakes ecosystem. For the third grade learners, you may want to have them illustrate the reflection paper with captions answering the questions.
- Ask each cooperative group to keep a daily journal of activities and a summary of discussions and conclusions.
- Facilitate a discussion on what learners think it means to be a steward. Try to guide them to define stewardship as "the responsible caring for something, in this case, our natural resources." Read Attachment Five: Situation Cards, together and discuss the extent to which each person demonstrated the concept of stewardship. Tell the learners that when they act philanthropically, they are also acting as stewards.
- Ask students to reflect on the various experiences they have had and decide, as a class, what philanthropic service project they would like to undertake that involves an activity to do with the closest lake or river.

Phase Three

- Have students discuss ways that society, past and present, has contributed to pollution of the ecosystem. Items to highlight are ground water contamination; sewage systems; fertilizers; insecticides; industrial accidental and illegal dumping such as spent oil and release of PCBs. Ask learners about trash, cans, and plastic can holders' role in pollution, harming wildlife. Talk about acid rain.
- Have students discuss how the concepts involved in stewardship and philanthropy can be connected to the saving of the Great Lakes ecosystems and list at least ten different things that we can do to help.

Demonstration/Celebration

Several student products provide opportunities to demonstrate learning and document impact. The instructor is encouraged to use all individual student and group products as opportunities to assess progress toward learning goals. These products include: completed handouts and assignments, posters, maps, journal entries, letters, and other documentation. Instructor observation, class participation, instructor-designed assessments, and evaluations of group and individual presentations also provide opportunities to assess progress toward learning goals. The instructor is also encouraged to document assessment of learning as part of individual student records. Including project updates in classroom and school newsletters to parents is another way to document progress.

Phase One

- Ask learners to complete Attachment One: Guided Practice to provide an opportunity for them to demonstrate comprehension of the story.
- Create a poster reflecting the slogan, "Give a Hoot, Don't Pollute," and write a caption for the poster.
- Display posters in the room or hallway outside the classroom

Phase Two

- Have learners develop and deliver graphic and oral presentations to their classmates on their discoveries and findings of their research and plans for what they could do to preserve the great lakes.
- Use journal entries and other products created as part of reflection activities to demonstrate learning.

Phase Three

- Have each group report the findings of their water test experiment to the class.
- Evaluate the cubing activity and associated products using a rubric.
- Collect and display letters written to nonprofit organizations and legislators and any responses received.
- Have each learner write a letter to the next year's class describing their project(s) and telling them what to do next year to improve the activity.

Learners may invite parents/guardians to class, demonstrate their cubes, and share the letters and responses they receive. Certificates of appreciation and achievements for all students may be presented.

Learners may plan and implement a Water Awareness Day or other event to inform school and local community members about issues facing local bodies of water, to highlight students' service projects, and to encourage others to get involved.

Service-Learning Standards

Duration and Intensity

Service-learning has sufficient duration and intensity to address community needs and meet specified outcomes.

Indicators:

1. Service-learning experiences include the processes of investigation of community needs, preparation for service, action, reflection, demonstration of learning and impacts, and celebration.
2. Service-learning is conducted during concentrated blocks of time across a period of several weeks or months.
3. Service-learning provides enough time to address identified community needs and achieve learning outcomes.

The lesson is designed to take place during roughly 30 hours of class time, over a period of several months. The lesson includes components that address each service-learning process and provides time to address identified community needs and achieve learning outcomes.

Link to Curriculum

Service-learning is intentionally used as an instructional strategy to meet learning goals and/or content standards.

Indicators:

1. Service-learning has clearly articulated learning goals.
2. Service-learning is explicitly aligned with the academic and/or programmatic curriculum.
3. Service-learning helps participants learn how to transfer knowledge and skills from one setting to another.
4. Service-learning that takes place in schools is formally recognized in School Board policies and in student records.

Learning goals are clear and connection to academic standards is explicit. Students acquire knowledge and skills through reading, classroom activities, Internet research and other activities and learn how to transfer this knowledge and skills into the planning, implementation, and evaluation of a service activit(ies). Instructors are encouraged to document student learning as a part of their records.

Partnerships

Service-learning partnerships are collaborative, mutually beneficial, and address community needs.

Indicators:

1. Service-learning involves a variety of partners, including youth, educators, families, community members, community-based organizations, and/or businesses.

2. Service-learning partnerships are characterized by frequent and regular communication to keep all partners well-informed about activities and progress.
3. Service-learning partners collaborate to establish a shared vision and set common goals to address community needs.
4. Service-learning partners collaboratively develop and implement action plans to meet specified goals.
5. Service-learning partners share knowledge and understanding of school and community assets and needs and view each other as valued resources.

The lesson includes explicit connections to parents; local, regional, and national nonprofit organizations; and legislators. Partnerships with local organizations concerned with water quality have great potential to foster strong communication and collaboration, mutually beneficial goals, and mutual recognition of partners as valued resources.

Meaningful Service

Service-learning actively engages participants in meaningful and personally relevant service activities.

Indicators:

1. Service-learning experiences are appropriate to participant ages and developmental abilities.
2. Service-learning addresses issues that are personally relevant to the participants.
Service-learning provides participants with interesting and engaging service activities.
3. Service-learning encourages participants to understand their service experiences in the context of the underlying societal issues being addressed.
4. Service-learning leads to attainable and visible outcomes that are valued by those being served.

The lesson includes several developmentally appropriate activities designed to engage learners in the content and highlight its personal relevance. A great deal of background information is introduced to ensure that the issues underlying the service activity are well understood. Documenting and publicizing water quality testing results provides a tangible outcome for learners. Responses to letters from legislators and others and community awareness activities and products also represent a visible outcome of student efforts.

Youth Voice

Service-learning provides youth with a strong voice in planning, implementing, and evaluating service-learning experiences with guidance from adults.

Indicators:

1. Service-learning engages youth in generating ideas during the planning, implementation, and evaluation processes.

2. Service-learning involves youth in the decision-making process throughout the service-learning experiences.
3. Service-learning involves youth and adults in creating an environment that supports trust and open expression of ideas.
4. Service-learning promotes acquisition of knowledge and skills to enhance youth leadership and decision-making.
5. Service-learning involves youth in evaluating the quality and effectiveness of the service-learning experience.

Learners are encouraged to provide input at every stage of the lesson. The lesson involves learners in the identification of local needs, consideration of solutions, and design and implementation of the service project(s). The lesson provides opportunities for learners to interact with adults throughout the process and includes an activity that asks students to evaluate their work.

Diversity

Service-learning promotes understanding of diversity and mutual respect among all participants.

Indicators

1. Service-learning helps participants identify and analyze different points of view to gain understanding of multiple perspectives.
2. Service-learning helps participants develop interpersonal skills in conflict resolution and group decision-making.
3. Service-learning helps participants actively seek to understand and value the diverse backgrounds and perspectives of those offering and receiving service.
4. Service-learning encourages participants to recognize and overcome stereotypes.

The lesson encourages learners to consider the history of the Great Lakes region and the impacts of different cultures over time. Group activities foster shared decision-making and leadership.

Reflection

Service-learning incorporates multiple challenging reflection activities that are ongoing and that prompt deep thinking and analysis about oneself and one's relationship to society.

Indicators:

1. Service-learning reflection includes a variety of verbal, written, artistic, and nonverbal activities to demonstrate understanding and changes in participants' knowledge, skills, and/or attitudes.
2. Service-learning reflection occurs before, during, and after the service experience.
3. Service-learning reflection prompts participants to think deeply about complex community problems and alternative solutions.

4. Service-learning reflection encourages participants to examine their preconceptions and assumptions in order to explore and understand their roles and responsibilities as citizens.
5. Service-learning reflection encourages participants to examine a variety of social and civic issues related to their service-learning experience to understand connections to public policy and civic life.

The lesson includes several types of reflection activities before, during, and after the service experience. Learners are encouraged to develop a deep understanding of the underlying issues and to consider multiple solutions and their likely impact.

Progress Monitoring

Service-learning engages participants in an ongoing process to assess the quality of implementation and progress toward meeting specified goals, and uses results for improvement and sustainability.

Indicators:

1. Service-learning participants collect evidence of progress toward meeting specific service goals and learning outcomes from multiple sources throughout the service-learning experience.
2. Service-learning participants collect evidence of the quality of service-learning implementation from multiple sources throughout the service-learning experience.
3. Service-learning participants use evidence to improve service-learning experiences.
4. Service-learning participants communicate evidence of progress toward goals and outcomes with the broader community, including policymakers and education leaders, to deepen service-learning understanding and ensure that high quality practices are sustained.

Learners are asked to solicit feedback about the quality and effectiveness of their service project(s) from representatives of community partner organizations. Progress toward goals is communicated through several demonstration activities, including a community awareness event.

Sources:

Adapted from a lesson published by *Learning to Give* and developed by Christine Jensen, Grand Rapids Public Schools, Grand Rapids, MI.