



The River Mile Water Quality

Lesson #11

Culminating Assessment

Water Quality Research and Action Plan





LESSON # 11

Summative Assessment: Water Research and Action

Suggested duration:

2 weeks research &
2-3 days to present research

Inquiry Question:

How does my water quality research lead to a local action project?

Inquiry Process:

Presenting and
Communicating research findings

Standards:

Content standards vary based on research project
EALRS 2 & 3 for inquiry and application

Assessment:

- Written Research Paper
- Presentation
- Peer Review

Materials:

Power point, video
Internet access

Handouts:

Research Rubric and guidelines
Research topics
Presentation guidelines & rubric

Credits/Citations:

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INTRODUCTION:

Students select a water quality or quantity focus of interest and conduct a research study. The research looks at a local water quality or quantity issue and compares the local conditions to another area in the world. Students investigate possible solutions and actions to positively impact the issue. Students propose a community stewardship action project. If and when possible students implement their action ideas and include reflections and data on the results.

STUDENT WORK AND ASSESSMENT

Assessment is based on completing the research project criteria as detailed in the rubric provided. Students are also assessed on their presentation and communication. They may select the media of their choice e.g., power point, video, poster session. Finally, students will receive peer reviews.

QUESTIONS TO EXPLORE/INSTRUCTIONS/PROCEDURE

1. Introduce the research project at the end of Lesson 1 or at least two weeks in advance of due date
2. Provide students with Research packet which includes:
 - a. Overview of Water Quality/Quantity research project
 - b. Connection to community stewardship action plan
 - c. Water Quality Research topic options
 - d. Benchmark timeline
 - e. Format for Research paper and assessment rubric
 - f. Presentation options & guidelines & assessment rubric
 - g. Peer review rubric
3. Check in with students on each benchmark date to support the timely completion of the research
4. Work with ELA teachers to provide additional research time or support in the writing of a research paper.
5. Make on-going connections between research projects and content of lesson 1-10.

WATER RESEARCH AND ACTION PLAN – PROJECT OUTLINE

Name: _____ Water Quality Issue:
_____ Location: _____

Essential Question:

- How is water quality affected by interactions in a watershed?
- How do we simultaneously use and protect our water and watershed?
- What leadership can I bring to my community?

Inquiry Question:

How does my water research lead to a local community action project that improves or protects my River Mile (TRM) site?

Objectives:

- Research and present an aspect of water quality that has local and global implications
- Analyze and explain the interrelationships between human activity, water quality and TRM site.
- Develop a research based plan of action and grant proposal to address a local water quality issue that impacts TRM site you are studying. Cite 3-5 primary and secondary sources of evidence.

Assignment:

You are a natural resource water quality scientist. Your job is to investigate the scientific, economic, political, cultural and social aspects of a current water quality issue that may impact TRM site. You will write and present an action plan proposal. In your proposal you will request \$500 to \$2,000 in grant funding from the Washington Foundation For the Environment. Your goal is to propose a pilot project for your local area that will improve water quality conditions. If successful your action plan could become a model for state, national or global water quality solutions. You will present your research and action plan proposal to a WFFE grant review committee along with a written abstract/summary for final funding review.

Think Time:

What local and global water quality issues do you think are important to research? Why? How do the issues impact TRM site?

Research Abstract and Action Plan Timeline:

- **By ___/___/___ select a water quality or quantity focus of interest and conduct a research study.** Below is a partial list of possible water quality issues to investigate. Once you have selected an area of focus. Investigate local and global events related to this water issue and the historical or recent impacts of this water issue in a specific local and global location. You may select additional water quality issues to research.

Water Quality Issues:

- Increased water temperature - logging, dam construction, reduced water quantity
- Dissolved Oxygen (DO)
- Ph balance
- Chemicals of Concern
- Fecal Coliform
- Point and Non-Point Source Pollution
- Storm water run-off
- Sediment loading
- Nutrient loading from phosphorus and nitrogen
- Climate change –precipitation, evaporation and snow pack changes

My selected water quality issue is _____ Date ___/___/___
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- **By ___/___/___ complete an investigation of the water quality issue. Take notes in your science journal. Remember to record specific web addresses to include in a bibliography.**

Suggested Research Links:

- Washington State Department of Ecology www.ecy.wa.gov
- Environmental Protection Agency www.epa.gov
- National Oceanic & Atmospheric Administration www.noaa.gov
- Lake Roosevelt Forum www.lrf.org
- Spokane River Forum www.spokaneriver.net
- Water on the Web www.waterontheweb.org
- USGS Washington Water Science Center <http://wa.water.usgs.gov/>

I have researched the water quality issue. I researched a variety of sources and feel like I understand the issues. I still have questions about _____ _____ _____ Date ___/___/___

- **By ___/___/___ complete an investigation of possible solutions and local actions that could positively impact the water quality issue.**

Sample Student Action Projects:

- Water Monitoring - Improved Water Quality
- Invasive Plant Pulls - Riparian Restoration
- Native Planting - Riparian Restoration
- Storm Drain Stenciling - Reduce Contaminants and Phosphorus going into the lake and river
- Trash Clean-up - Restoration
- Rain Gardens and storm drain swales - Reduce Storm water Runoff
- Organize Wildriver Scenic Film Festival (Patagonia) – Community outreach
- Education outreach for Phosphorus Free products - Reduce phosphorus in river
- Water Conservation Marketing - Improve Stream Flows

I have researched possible solutions and will develop a plan of action around _____ Date ___/___/___

- **By ___/___/___ compare local water conditions to another area in the world**

State, National & Global Water Projects:

- Bronx River Alliance www.bronxriver.org
- Flint River Watershed Coalition <http://www.geneseegreen.org/>
- Friends of Chicago River <http://www.chicagoriver.org>
- United Nations - World Water www.unwater.org/
- Global Issues www.globalissues.org/
- Washington State Department of Ecology River & Stream WQ Monitoring http://www.ecy.wa.gov/programs/eap/fw_riv/rv_main.html
- UNICEF <http://www.unicef.org/>
- World Health Organization - Water www.who.int/water_sanitation_health/dwg/en/
- Gallup Poll: Water Quality an Issue Around the World 2008 <http://www.gallup.com/poll/105211/water-quality-issue-around-world.aspx>
- PBS Frontline News: What's in Your Water Bottle? <http://www.pbs.org/frontlineworld/stories/bolivia/waterbottle.html>

Our local water quality issue of _____ is also an issue in these other state, national or global locations _____ and _____ I plan to compare our situation with _____. Date ___/___/___
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- **By ___/___/___ create a bibliography of references and citation** using the MLA/ APA formats. Include a variety of 3-5 peer reviewed sources (websites/ journal or news articles, etc...) see page #6.

The bibliography is complete and has a minimum of 3 citations

Date ___/___/___

- **By ___/___/___ write an abstract.** The purpose of the abstract is to provide a brief and comprehensive summary of your research proposal. It is vital because it is all that most people will read when you submit a paper. It includes:
 - Description of the water quality issue and the problem it presents locally and globally
 - A proposed solution or plan of action.
 - Research evidence (2-3 examples) that support your proposed solution(s).
 - Check that the data and information is accurate (based on in depth research),
 - Information must be
 - clear (spell out abbreviations and include enough detail to be understood),
 - specific (begin with the most important information and limit it to three or four most important findings or implications of the research).
 - concise (1-3 pages maximum)
 - Self assess your research abstract using the rubric provided on page #7

The abstract is complete. I have self evaluated and made any needed changes or additions

Date ___/___/___

- **By ___/___/___ create a power point presentation** for the Washington Foundation For the Environment (WFFE) and propose a community stewardship action project. Include a budget of up to \$2,000. WFFE offers a \$500 award to High School Seniors who submit an environmentally focused Senior Project application available on www.wffe.org. Guidelines, template, and scoring guide are provided on pages 8-11. Creativity is highly valued and you may add additional items that support your presentation.

The power point presentation is complete. Have reviewed the presentation scoring guide on page # 11 and I am ready for the formal presentation with the Grant committee.

Date ___/___/___

References and Citations

Examples: <http://www2.ohlone.edu/org/library/apacited.html>

- Bhutto, Benazir. (1997). In *Encyclopedia Americana*. (Vol.3), 644-45.
Danbury, CT: Grolier, Inc. [**encyclopedia article -- note that Bhutto, Benazir is the title of the article, not the author's name**]
- Counting California. (2002, June 18). Retrieved Oct. 1, 2002 from
<http://countingcalifornia.cdlib.org> [**website**]
- Hawking, S. W., Thorne, K. S., Novikov, I., Ferris, T., & Lightman, A. (2002).
The future of spacetime. New York: W.W. Norton & Co.
[**book/ multiple authors**]
- Kagan, L.J., Aiello, A.E., & Larson, E. (2002, August). The role of the
home environment in the transmission of infectious diseases
Journal of Community Health(27)(4), 247-267. Retrieved October 8, 2002
from CINAHL Plus with Full Text database.
[**Scholarly journal article/ multiple authors**]
- Khan, Z. (2002, Sept. 2). Pakistan rejects Bhutto's candidacy; Former prime
minister will campaign anyway, aide says. *Washington Post*, p. A19.
Retrieved September 19, 2002 from Newsbank Newspapers database.
[**News article from the web**]
- Lowenherz, D. H., Ed. (2002). *The 50 greatest love letters of all time*. New
York: Crown. [**Book with an editor instead of an author**]
- Makela, M. (1998). Viruses and bacteria in the etiology of the common cold.
Journal of Clinical Microbiology (36), 539-542. Retrieved October 1,
2002 from <http://jcm.asm.org> [**Scholarly journal article/ single author**]
- Needleman, J. (2002). *The American soul: Rediscovering the wisdom of the
founders*. New York: Putnam. [**Book with a subtitle**]

Reference & Citations - Basics Purdue Online Writing Lab (<http://owl.english.purdue.edu/owl/resource/560/05/>)

- All lines after the first line of each entry in your reference list should be indented one-half inch from the left margin. This is called hanging indentation.
- Authors' names are inverted (last name first); give the last name and initials for all authors of a particular work if it has three to seven authors. If the work has more than seven authors, list the first six authors and then use ellipses after the sixth author's name. After the ellipses, list the last author's name of the work.
- Reference list entries should be alphabetized by the last name of the first author of each work.
- More than one article by the same author, single-author references or multiple-author references with the exact same authors in the exact same order are listed in order by the year of publication, starting with the earliest.
- When referring to any work that is NOT a journal, such as a book, article, or Web page, capitalize only the first letter of the first word of a title and subtitle, the first word after a colon or a dash in the title, and proper nouns. Do not capitalize the first letter of the second word in a hyphenated compound word.
- Capitalize all major words in journal titles.
- Italicize titles of longer works such as books and journals. Do not italicize, underline, or put quotes around the titles of shorter works such as journal articles or essays in edited collections.

Date Finished	Water Research Abstract - Checklist and Point Sheet	Point Value	Points Earned
	<p>Format: Write a 1-3 page abstract which is double spaced Use Times New Roman, 12 point font with 1 inch margins Do not use indentation First and last names appear in the top left hand corner The title of paper is centered on the first line</p>	10	
	<p>Research Question: The abstract begins with a thesis statement which expresses the water quality issue as a scientific inquiry and proposes a plan of action or solution which is supported by research.</p>	25	
	<p>Evidence is provided that reveals understanding of the water quality issue. Include 3- 5 different research or reference sources (e.g., scholarly journal, encyclopedia, newspaper, book, interview, website).</p>	25	
	<p>Action Plan Addresses specific actions to make a positive change in the water issue. Identifies who will be involved (government agencies, environmental organizations, business community, social or cultural groups, etc). Suggests how to educate and involve others in the water issue. Compares your plan to how others across the world have responded. Identifies any local barriers to the plan that exist (economic, behavioral, scientific, regulatory, etc)</p>	20	
	<p>Grammar and spelling are correctly used in the abstract (neat, informative, little to no errors, strong organization)</p>	10	
	<p>Complete bibliography (work cited) in proper format with resources alphabetized by author's last name with the 2nd, 3rd line of each source indented.</p>	10	
	<p>Reviewer's comments:</p>		
	<p>Total</p>	100	

WATER RESEARCH ACTION PLAN - POWER POINT SLIDESHOW GUIDELINES

Below are suggested guidelines for your PowerPoint presentation. You are encouraged to be creative and inventive while including the content requirements. Feel free to add anything not mentioned below if you determine it will strengthen your presentation and grant request. Limit your presentation length to between 12 and 28 slides or five minutes total.

Slide 1: Title Slide (your name, water quality issue, local & global areas of impact)

Slide 2: Introduce the Problem (brief overview of the water quality issue in the local context)

Slide 3 – 6: Water Quality Issue Information

- causes of the water quality issue and where locally and globally it is most commonly found
- *Min = 2 slides*
- Include at least 2 images/pictures/graphs etc.

Slides 7-14: Local & Global Location Information

- Relevant information about the people, politics, government, economy, and culture of your locations
- *Min = 2 slides*
- Include a map of your local and global region/area; show location of water issue if possible

Slides 15-16: Plan for Community Action to Impact or Educate about Local Water Issue

- What actions do you think would make a positive change in the water issue
- Who need to be involved? (government agencies, , environmental organizations, business community, social or cultural groups, etc)
- What would you do to educate people about the water issue?
- How has the world responded to the crisis in other locations?
- What barriers to change exist? (scientific, political, economic, environmental, behavioral)
- *Min = 2 slide.* Include at least 1 graphic

Slide 17-18: The Grant Proposal

- Proposal Summary – highlight the key points of your proposed action plan. Include a budget for materials and an overview of resources necessary to implement your plan.

Slide 19: References/ Works Cited

- Write in proper format the sources you accessed for information for this slide show presentation
- Minimum of 2 diverse resources (websites, journal articles, etc)
- Any image or graphic used in your PPT slideshow should be cited/referenced either on the slide itself or at the end on the Reference page.

Slide 20: Acknowledgements and Thank-you

- Include thanks to the people or organizations who helped you with this project
- Thanks to the grant committee for their time and considering your project
- Include one final thought about your vision of the difference this action plan, if funded, will provide for improving water quality in the local community

WATER RESEARCH ACTION PLAN – POWER POINT SLIDESHOW STORYBOARD

Draft your presentation of the water quality issue, research and action plan on the slide templates below.

Slide 1: Title	Slide 2: Introduce the Problem
Slide 3: Water Quality Information	Slide 4: Water Quality Information
Slide 5: Water Quality Information	Slide 6: Water Quality Information
Slide 7: Local Issue	Slide 8: Local Issue
Slide 9: Local Issue	Slide 10: Local Issue

Slide 11: Global Issue	Slide 12: Global Issue
Slide 13: Global Issue	Slide 14: Global Issue
Slide 15: Plan of Action	Slide 16: Plan of Action
Slide 17: Grant Proposal Request	Slide 18: Grant Proposal Request
Slide 19: References & Citations	Slide 20: Acknowledgements & Thank You

WATER RESEARCH ACTION PLAN - PRESENTATION SCORING GUIDE		POINTS
DELIVERY	24 POINTS POSSIBLE FOR DELIVERY = TOTAL	
	<ul style="list-style-type: none"> • Speech is clear, expressive, and can easily be heard 	
	<ul style="list-style-type: none"> • Effective command of language; proper pronunciation 	
	<ul style="list-style-type: none"> • Communicates information and grant request persuasively (may use note cards) 	
	<ul style="list-style-type: none"> • Uses appropriate body language; including eye contact and is poised 	
	<ul style="list-style-type: none"> • Extemporaneous ability to answer questions posed by audience with confidence 	
	<ul style="list-style-type: none"> • Attire is appropriate for this type of presentation 	
FORMAT	36 POINTS POSSIBLE FOR FORMAT = TOTAL	
	<ul style="list-style-type: none"> • Organized and stays within allotted time frame 	
	<ul style="list-style-type: none"> • Introduction engages the listeners interest and establishes a sense of purpose or direction 	
	<ul style="list-style-type: none"> • Body conveys essential and critical information that flow logically and smoothly 	
	<ul style="list-style-type: none"> • Conclusion effectively summarizes the presentation with a specific grant request 	
	<ul style="list-style-type: none"> • Design of materials is clear and supports or enhances content understanding 	
	<ul style="list-style-type: none"> • Uses relevant graphics, models, samples and visual images 	
	<ul style="list-style-type: none"> • Power Point, poster or video text has no spelling or grammar errors 	
	<ul style="list-style-type: none"> • Font used is readable in a large group presentation 	
	<ul style="list-style-type: none"> • Design uses artistic elements effectively (musical, visual and/or performing arts) 	
CONTENT	40 POINTS POSSIBLE FOR CONTENT = TOTAL	
	<ul style="list-style-type: none"> • Demonstrate knowledge of material, understands topic, information is accurate 	
	<ul style="list-style-type: none"> • Tell why and how the local and global water research focus was chosen 	
	<ul style="list-style-type: none"> • Describe the <u>global</u> water issue (geographic location, government policy, business interests, environmental initiatives, technological solutions or unintended consequences) 	
	<ul style="list-style-type: none"> • Describe the <u>local</u> water issue (geographic location, government policy, business interests, environmental initiatives, technological solutions or unintended consequences) 	
	<ul style="list-style-type: none"> • Relevant current events (What's in the news lately e.g., politics, economy, social etc...?) 	
	<ul style="list-style-type: none"> • Population (Who is affected? Why? Ex: Is a particular river body, watershed, city, state or country most affected? Effect of water issue on health, economy, plants & wildlife, government) 	
	<ul style="list-style-type: none"> • Government and International response (What is the government doing about the water issue? Who else is involved? What programs, if any, already exist? Are they effective?) 	
	<ul style="list-style-type: none"> • Your Plan for Community Action to improve water quality or reduce water consumption. ~ How do you plan on making a difference? Ex: how will you involve the public? Raise funds for various projects? Will you encounter any draw backs or hindrances? If so what major issue(s) might you encounter and how might you deal with it? 	
	<ul style="list-style-type: none"> • Reflection (How has this project influenced your thinking, choices, action, or career goals?) 	
	<ul style="list-style-type: none"> • References cited (At least 5 peer reviewed sources: websites/ journal or news article, etc...) 	
100 POINTS POSSIBLE TOTAL FOR DELIVERY, FORMAT AND CONTENT		

Grant Opportunities for Students

Washington Foundation For the Environment

<http://www.wffe.org/index.htm>

Action for Nature

<http://www.actionfornature.org/home.aspx>