



Lesson 1:

Why Should We Keep the Great Lakes Great?

Grade Level: 9-12

Time: 55 Minutes

Vocabulary:

Native, invasive, sediment, U.S. Environmental Protection Agency, remediation, restoration.

Great Lakes

Literacy Principles:

Principle 2

Concept E

Principle 5

Concept I

Principle 6

Concepts D, E, F

Principle 8

Concept F

Summary:

Students create a PowerPoint and learn about an environmental cleanup in their community, including details about scope and design.

Objectives:

- Describe the benefits of the Great Lakes.
- Discuss the effect of historical pollution on today's economy, society, and environment.
- Describe the technical aspects of an environmental cleanup.

Materials:

An example PowerPoint (editable .ppt file) can be found on www.greatlakesmud.org/education.html.

Procedure:

Administer the PowerPoint creation activity.

Assessment:

Conduct the cleanup pretest prior to the first lesson.



Name _____ Date ____/____/____

Part I: Multiple Choice

Read each question carefully and circle the correct answer.

1) What are two environmental problems that make the local water body unsuitable habitat for many species?

- a. Species abundance, biodiversity
- b. Contaminated sediment, invasive species
- c. Biodiversity, contaminated sediment
- d. Invasive species, species abundance

2) Scientists make _____ using their senses (smell, sight, etc.) to understand and make hypotheses about the world.

- a. observations
- b. data
- c. science
- d. sampling

3) Which of the following is NOT a step that must precede the actual cleanup in a Great Lakes Legacy Act project?

- a. Project design
- b. Sampling
- c. Application
- d. Habitat restoration

4) The Great Lakes Legacy Act targets pollution from industrial discharges _____.

- a. and cannot clearly be traced to a viable entity
- b. and can clearly be traced to a viable entity

Part II: Statistics

Give the mean, median, mode, and any outliers for the data in column L-1 of Table 1.

5) Mean _____

6) Median _____

7) Mode _____

8) Outlier(s) _____

Table 1. Levels of contaminant "X" detected in water quality samples.

Date	L-1	L-2	L-3	L-10	RSL
1-Sep	1.2	0.65	0	0	0.31
30-Aug	0	0	0	0	0.31
10-Aug	.65	0	0	0.73	0.31
5-Aug	1.2	0.79	0.89	0	0.31
2-Aug	0.68	0	0	0	0.31
25-Jul	0.71	0.72	0.63	0	0.31
20-Jul	1	0	0		0.31
14-Jul	0.63	0	0		0.31
13-Jul	3.5	0	0		0.31
7-Jul	0.66	0.66	0.75	0.5	0.31
5-Jul	0.79	0.83	0.72		0.31

9) Table 1 displays results in a format that scientists use to communicate data with one another. This format is not good for communicating science to the public. In a couple sentences, describe two alternatives for communicating these data to the public. (Note: levels of contaminant "X" above 2.0 are dangerous.)

Part III: Fill in the Blank

Read each statement carefully and fill in the blank with the correct answer.

10) A(n) _____ species is supposed to live in the local ecosystem. It belongs there.

11) A(n) _____ species does not belong in the local ecosystem. It harms the species that belong in the ecosystem.

12) _____ is the wet, squishy mud found at the bottom of a river or lake.

Part IV: Short Answer

Read each question carefully and provide an answer using a complete sentence.

13) What are three environmental, social, or economic benefits that people derive from the Great Lakes?

14) Why is it important for scientists and engineers to work as a team to clean up the environment?

Our Area of Concern: Gettin' Cleaned Up

To learn more about your Area of Concern, you are going to do some internet research using Google and the GreatLakesMud.org site for basic information to create a class PowerPoint. Either individually or as small groups, have students "mine" for information on the site and create a slide on one or two points of information. Once each student/group has their PowerPoint slides created they should be imported into one presentation and each group will present their slides.

Slides needed for the presentation:

1. Title slide with an aerial or site picture of the Area of Concern with a catchy title.
2. A slide showing the audience what benefits we receive from the Great Lakes. (i.e. drinking water, recreation, etc.)
3. A slide with a picture of polluted sediment. Examples can be found on the GreatLakesMud.org pollution page. The students can ask the class if they know what sediment is (mud at the bottom of a lake or river). Any facts about the specific sediment pollutants of your Area of Concern would be valuable as well.
4. A slide of an aquatic food web. Examples of food webs can be found on the GreatLakesMud.org Education Introduction page for food web examples. Keep in mind that not all organisms on these food webs will necessarily be in your waterbody. Consult with Illinois-Indiana Sea Grant on organisms that are native to the area.
5. A slide that relates polluted sediment with the effects of the food chain.
6. A slide that circles back to how polluted sediment affects the benefits of the Great Lakes (slide 2).
7. Several slides for the Great Lakes Legacy Act including:
 - a. Who is involved?
 - b. What the partners' role?
 - c. What progress has been made so far? Pounds /cubic yards of contaminated sediment removed? Make the numbers relatable (i.e. 5 million pounds = 750 adult male elephants).
 - i. Volume of sediment. Again make it relatable to your audience.
 - ii. Cost. Once again, how is millions of dollars relatable to your audience?
 - d. What is the process start to finish for a restoration project?
 - i. Helpful resources for research
 1. [GreatLakesMud.org](http://www.greatlakesmud.org/legacy-act.html) Legacy Act tab
 2. U.S. Environmental Protection Agency
<http://www.epa.gov/great-lakes-legacy-act>
 3. Presentation by Marc Tuchman – GLNPO
<http://tinyurl.com/jbzqwrw>
8. A slide on what's going on in my Area of Concern? Use GreatLakesMud.org for information.
 - a. How much is getting cleaned up?
 - i. Volume (make relatable)
 - ii. Acreage
 - iii. Cost (relatable)
9. 7-10 slides with pictures of the site cleanup. Some will be found on GreatLakesMud.org. Check with Illinois-Indiana Sea Grant for other reliable sources for photographs.
10. Final slide for questions remaining about the project that the class can ask Illinois-Indiana Sea Grant or project managers when available.