

8. Restoring Rivers of the Great Lakes

Overview and Purpose

To introduce students to some of the ways that rivers are being restored from the consequences of industrialization and urbanization in the Great Lakes region.

Lesson Summary

Students will become familiar with two major river projects, one in the Chicago River and the other on the Cuyahoga River, and the restoration efforts involved with each.

They will learn about what happened to each river to cause damage to the river's ecosystem and what is being done to repair the harm. Students will analyze and evaluate the restoration efforts of each river and make comparisons and connections to understand how river restoration is important to protecting the Great Lakes.

The background context that is needed for this lesson is for students to know the basic geography of the Cuyahoga River and Chicago River with respect to the Great Lakes region. It is also helpful if students understand the concept of an ecosystem and can describe how that might apply to a river.

ESSENTIAL THEMES	● River ecosystems, water restoration efforts, the Cuyahoga River and the Chicago River
NEXT GENERATION SCIENCE STANDARDS	→ SEP8: Integrate qualitative and/or quantitative scientific and/or technical information in written text with that contained in media and visual displays to clarify claims and findings. → MS-ESS3-3: Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment. → SEP2: use a model to generate data to test ideas about phenomena in natural or designed systems, including those representing inputs and outputs, and those at unobservable scales. → MS-LS2-5. Evaluate competing design solutions for protecting an ecosystem. Discuss benefits and limitations of each design.

OBJECTIVES	☐ Know some of the ways that rivers are threatened and being restored from those threats ☐ Understand the ways in which Great Lakes waterways involve rivers ☐ Make comparisons and connections between solutions to environmental challenges
ESTIMATED TIME	❖ 1 class period

Materials Needed

- Video projection monitor or screen/speakers
- Internet browser
- Student computers, laptops, or tablets
- Notebooks and pencils
- Chart paper or dry erase boards and markers

Facilitation Steps

WARM UP: Begin by asking students what they already know about the essential themes of the lesson and what they wonder about it. Have them turn and talk with a shoulder partner. Then, after a minute of conversation, elicit responses from a couple of volunteers and jot down 2-3 ideas on the board under the categories KNOW and WONDER. The teacher should help students clarify their ideas as they are shared by checking for understanding using a talk move such as “so you are saying...” or help students think together by asking for a show of hands of agreement from the class in response to what individual students share.

LAUNCH: Once the warm up has concluded, give a brief overview of the background context to students, making connections to their KNOW and WONDER responses as well as any other relevant prior knowledge they would have from other lessons they have learned. Describe the activities planned for this lesson to students.

ACTIVITY 1: Floating River Habitats

First, direct students’ attention to the impact that urbanization would have on the natural ecosystems and habitats in the Great Lakes region, such as in an area by a big city like Chicago and the Chicago River. Call their attention specifically to the way that a lack of native plants might affect the aquatic species in the water by a big city. Ask them to consider what the impact of declining native species might have on the fish and elicit 1-2 student responses.

Next, introduce students to the 4 Notes Summary protocol that they will use after they watch the upcoming video on floating habitats, where they write one of each of the following:

- Oooh! (something that was interesting)
- Aaah! (something that was an ah-ha moment)
- Hmmm... (something that left them thinking afterward)
- Huh? (a question they have afterward)

Ask students to give an example of each type of note that they will be making to check for understanding.

Then, have a volunteer read the introductory overview [article on Floating Habitats](#) before showing [the video segment about the Floating Habitats](#) from Great Lakes Now.

Last, have students create a 4 Notes Summary on the article and elicit a few responses from students to the whole class about what they took away from the video.

ACTIVITY 2: River On Fire

First, pair students up with a partner and have them share their responses to the 4 Notes Summary from the Floating Habitats video activity with each other.

Next, direct students to view online, the article and video [River on Fire](#) from Great Lakes Now. Have them read the article and watch [the first segment from the River on Fire video](#) on their own.

Then, have partners create a Comparison and Connection T-chart summarizing how the first video about the Chicago River compares and connects with the second video about the Cuyahoga River. In this chart, the comparisons should include ways in which the two river situations are similar and how they are different; the connections should include ways that the two situations connect to each other (either directly or indirectly) based on the students' discussion.

Last, have pairs share with the class some of their connections and comparisons between the situations of restoration with both rivers while the teacher generates a class Comparison and Connection T-chart on the board. End the activity by asking the students to turn and talk with their partner about what factors they think would be most preventable in issues like the ones described between both rivers and how they would suggest preventing them. Ask for a couple of volunteers to share their ideas.

SYNTHESIS: Give students individual thinking and writing time in their notebooks to synthesize their learning by jotting down their own reflections using a Word, Phrase, Sentence protocol, with:

- A **word** that they thought was most important from the lesson
- A **phrase** that they would like to remember
- A **sentence** that sums up what they learned in the lesson

After the individual synthesis is complete, students should share their synthesis with a shoulder partner.

COOL DOWN: Have students complete a 3, 2, 1 Review protocol for the lesson with a partner, recording in their notebooks or, optionally, on exit ticket slips to submit, the following:

- **3** things that they liked or learned
- **2** things that make more sense now
- **1** question that they were left with

CLOSURE: Have one student share a response from each of the categories of the 3, 2, 1 Review. Depending on the available time, the teacher can make connections between the ideas students share and the learning objectives of the lesson, and respond to the question that is shared.

EXIT TICKET: Students describe what they think would be the biggest obstacle to restoration efforts on rivers and explain why.

About the Author

Gary is an educational consultant, award-winning science educator and the author of [Science With Scarlett](#). He is also a double cornea transplant recipient who, since having his sight restored, was moved to use his teaching gifts to make science fun for kids. He lives with his family near Detroit and designs learning experiences to inspire children, like his own daughter, to love science. Gary is the 2014 recipient of the Michigan Teacher of the Year honor. Contact him via his consulting firm, [Saga Educators](#), or connect with him on [Twitter](#).

About Great Lakes Now

With a [monthly magazine-style television program](#) and daily online reports at [GreatLakesNow.org](#), the **Great Lakes Now** initiative offers in-depth coverage of news, issues, events and developments affecting the lakes and the communities that depend on them, while capturing the character and culture of the region.