

# 5. Lake Invaders

## Overview and Purpose

To understand how invasive species threaten the Great Lakes ecosystem.

## Lesson Summary

Students will examine one of the most notable invasive species threatening the Great Lakes—the Asian Carp—and explore some of the solutions that are being tried to deal with the invasive species around the lakes. They will learn about the invasive species through several short videos and then integrate their knowledge by creating an infographic about the threat posed to the Great Lakes by the Asian Carp.

The background context that is needed for this lesson is for students to know predator-prey relationships, food chains and food webs, and population dynamics. Students should also be familiar with creating an infographic and using a digital tool to do so.

This lesson focuses on students collecting data and analyzing trends to make claims based on evidence and reasoning, but it also focuses on students interpreting and communicating knowledge.

<b>ESSENTIAL THEMES</b>	<ul style="list-style-type: none"><li>● Invasive species and their effect on ecosystems</li></ul>
<b>NEXT GENERATION SCIENCE STANDARDS</b>	<ul style="list-style-type: none"><li>→ MS-ESS3.A.1 Humans depend on Earth’s land, ocean, atmosphere, and biosphere for many different resources.</li><li>→ MS-LS2-1 Ecosystems: Interactions, Energy and Dynamics. Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem.</li><li>→ MS-LS2-2 Ecosystems: Interactions, Energy and Dynamics. Construct an explanation about how the different parts of the food chain are dependent on each other.</li><li>→ SEP6: Apply scientific ideas, principles, and/or evidence to construct, revise and/or use an explanation for real world phenomena, examples, or events.</li><li>→ SEP7: Construct, use, and/or present an oral and written argument supported by empirical evidence and scientific reasoning to support or refute an explanation or a model for a phenomenon or a solution to a problem.</li></ul>

<b>OBJECTIVES</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Identify the types of threats posed to the Great Lakes by Asian Carp</li> <li><input type="checkbox"/> Discuss possible solutions to the problem posed by an invasive species</li> <li><input type="checkbox"/> Create a visual representation of knowledge and communicate it to others</li> </ul>
<b>ESTIMATED TIME</b>	❖ <b>2-3 class periods</b>

## Materials Needed

- Video projection monitor or screen/speakers
- Internet access via computers or mobile devices (e.g., tablets, cellphones)
- Notebooks and pencils
- Chart paper or a dry erase board 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: Meet the Invaders

First, explain to students that they will be learning about an invasive fish species impacting the Great Lakes—the Asian Carp—and creating an infographic to summarize the effect the Asian Carp species are having on the Great Lakes, as well as possible solutions to the problem. To help them build knowledge for making their infographics, they will be watching videos on Asian Carp from PBS NewsHour and Great Lakes Now.

Next, inform students of the essential components of the infographic so that they know what to focus on during the viewing of the video content (optionally, you may provide students with an advanced organizer that summarizes these points to use for note taking during the videos):

- Classification of each Asian Carp species (e.g., name, identifying features and locations of each)
- Why these species pose threats to the Great Lakes region
- Possible solutions to the Asian Carp threat

Then, play the following three videos for the class, take a break after each one to ask a couple of students to share takeaways from each:

1. [How to identify the types of Asian Carp](#) from Great Lakes Now for the class.
2. [Episode 1003 Segment 2 \(9:14 — 18:22\) of Great Lakes Now](#)
3. [Midwest battles to keep invasive Asian carp out of the Great Lakes](#) from PBS News Hour

Last, debrief the videos with the entire class using a 4 Notes Summary protocol, in which you ask for students to share aloud one of the following four notes to summarize takeaways from the video:

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

## **ACTIVITY 2: Great Lakes Invaders Infographics**

First, explain to students that they are going to apply their learning from the videos in the previous activity by summarizing the threat that Asian Carp pose to the Great Lakes in a visual way. They will create an infographic (using an infographic tool such as [Canva](#)) about the Asian Carp threat to communicate the information about the threat this invasive species poses to the Great Lakes. Their infographics need to address the following:

- The definition of an invasive species
- List and describe each Asian Carp species (e.g., name, identifying features, current locations of each, and which part(s) of the Great Lakes they threaten)
- Explain why these species pose threats to the Great Lakes region (e.g., outcompeting native species for ecosystem resources)
- Describe possible solutions to the Asian Carp threat (e.g., electric fields, etc.)
- Highlight which solution to the problem might be the most workable to consider

- Infographics should have minimal text as well as plentiful graphics (e.g., photos, charts, graphs, icons, symbols, etc.)

Next, have students partner up to work on creating their infographics. Remind students that they should refer to their notes from the videos as they work on creating their infographics, and provide them the URLs to view the videos again, as needed, for their research on the topic. Encourage students to outline their information or sketch a draft of their infographic in their notebooks before proceeding to work with the infographic creation tool.

Then, allow students time to work on completing their infographics. Monitor students as they work on their projects to give feedback on their outlines/sketches before they proceed to creating their final infographic. At the end, they should either have them printed out or have a digital way to show their infographic to classmates.

Last, have three partnerships of students join each other to present and review their infographics together in a Cafe Meetup. In a Cafe Meetup, students sit around the same table displaying their work to one another on the table in front of them all at the same time and discuss their work by comparing and connecting the ideas of classmates to their own ideas on a given topic or task. They do this by thinking out loud about the features of their classmates' work that compare (similarities and differences) and connect (all groups included something relating to...) with their own ideas.

*\*Share what students create with Great Lakes Now by emailing their infographics to [gln@dptv.org](mailto:gln@dptv.org) or by posting them on Facebook or Twitter with @GreatLakesNow!*

**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 write which of the solutions to the invasive species threat Asian Carp pose to the Great Lakes they think is most promising 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.