



LEARNING LABS

GREAT LAKES: TESTING THE WATERS

Students go behind the scenes at Shedd and apply problem-based learning to explore an imbalance in a Great Lakes ecosystem. Students explore exhibit habitats and perform water-quality tests. They are then challenged to interpret their results to evaluate the health of the Great Lakes and some of its fish populations.

GRADE LEVEL: 9-12 | **CAPACITY:** 30 students | **DURATION:** 90 minutes

KEY CONCEPTS

Invasive species, ecology, ecosystems, human impact, population dynamics

SKILLS

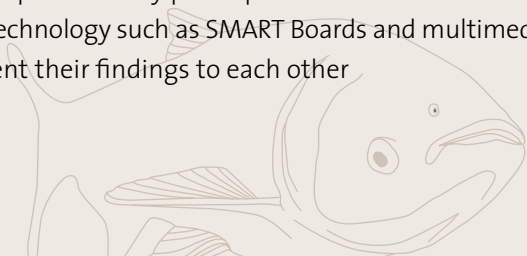
Scientific investigation and method, collaboration and communication, data collection and analysis, presentation, inquiry

IL STATE LEARNING STANDARDS

- 11.A.4a, 11.a.4b, 11.A.4c, 11.A.4f, 11.A.5a, 11.A.5c, 11.A.5e
- 12.B.4a, 12.B.4b, 12.B.5a, 12.B.5b
- 13.A.4a, 13.B.4b, 13.B.4c, 13.B.4d, 13.B.5c, 13.B.5e

WHAT TO EXPECT FROM THE LEARNING EXPERIENCE

- Students work in groups using scientific tools to explore a Great Lakes ecosystem
- Students generate their own hypotheses and pursue investigations to answer them
- Teacher and chaperones may participate
- Students use technology such as SMART Boards and multimedia resources
- Students present their findings to each other



For more information contact
studentprograms@sheddaquarium.org



FURTHER EXPLORATION

Shedd Educational Adventures
Focus on an animal and environmental
action program

<http://sea.sheddaquarium.org/sea/>

The IUCN Red List of Threatened Species

<http://www.iucnredlist.org>

Encyclopedia of Life

<http://www.eol.org/>

**Real-Life Aliens: Introduced Species
lesson**

[http://www.actionbioscience.org/
biodiversity/lessons/
simberlofflessons.pdf](http://www.actionbioscience.org/biodiversity/lessons/simberlofflessons.pdf)

Invasive species profiles

[http://www.invasivespeciesinfo.gov/
aquatics/main.shtml](http://www.invasivespeciesinfo.gov/aquatics/main.shtml)



CONNECTIONS TO THE EXHIBITS

The aquarium is a big place with a global fish collection. Below are suggestions to help you focus your field trip explorations.

Local Waters gallery

The Great Lakes are home to many species, each with different needs. Have students observe the diverse habitats. Ask them to focus on three exhibits and compare/contrast the features of the habitats. What animals are present in each habitat? How are they adapted to that environment? How could these habitats be interconnected?

Rivers gallery

Find the highly specialized paddlefish in a habitat at the far end of the gallery. This species has declined in population over the years. As students observe these large fish, have them discuss how late maturation combined with human impacts might affect them. How might the introduction of another aquatic species intensify the decline? What conservation actions can be taken to increase the paddlefish population?

Wild Reef

Expand your students' understanding of Great Lakes issues through a global perspective. Wild Reef's shark exhibit is home to several shark species, each with a unique life history. These apex predators are declining in population worldwide. What could cause an apex predator to decline? What are the consequences of a population decline? What other animals are affected? Are humans affected?

CONNECTIONS TO THE CLASSROOM

- Before visiting the aquarium, prepare students by having them learn more about both the native and the invasive species that live in Lake Michigan. Have students compare a native and an invasive species from the same phylogenetic group, such as local mussels and zebra mussels. Discuss how invasive species compete with native species for resources.
- After your visit, have the class look at a few species that are declining in the Great Lakes. Students can research how state and federal policies affect fish populations. You can discuss how policymakers use the IUCN Red List statuses of species to make management and conservation decisions.
- Back in the classroom, students should work in groups to come up with possible solutions to the problems discussed in the program at Shedd. They should use all of the information they learned about rainbow darters and other local species while researching more information as necessary.