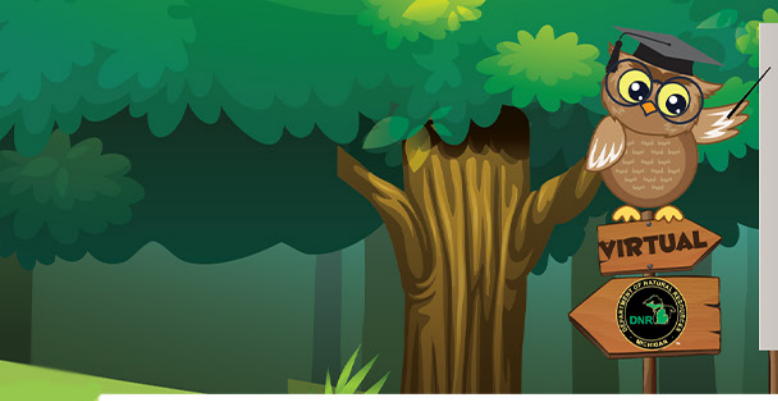

Nature at School
Pre-lesson
Hatchery to Habitat

Learning outcomes:

Join Wolf Lake State Fish Hatchery educator Shana Ramsey from southwest Michigan to connect students to nature and learn about fish biology and how the DNR raises fish to release into Michigan waters. During our 30-minute lesson, we will meet the following objectives:

- Comprehend the complexity and science-based process of raising fish.
- Describe the life stages of fish.
- Explain the positive impacts of fish management and conservation.
- Understand threats to fisheries in Michigan.

Background information:

Michigan has more than 150 species of fish. Learning more about them, and how and why the DNR raises fish, will help students connect to and comprehend the importance of conservation and management of all the natural resources in Michigan.

Fish are an important part of Michigan's lakes, rivers, and streams. Hatcheries are one tool the DNR uses to raise and release millions of fish every year to maintain healthy aquatic ecosystems, provide world-class angling opportunities, and support a dynamic multibillion-dollar fishing economy.

In this program, explore the scientific processes used to raise fish while discovering several fish species found in Michigan.

Resources:

Michigan DNR fish hatcheries
Chinook Salmon Life Stages video

Suggested pre-activity:

Least Wanted, Sea Lamprey: This activity helps students understand the relationship between native and invasive species in the Great Lakes. It can be found in the Salmon in the Classroom Activity Guide, page 153.

Directions for your *DNR Nature at School* virtual program:

1. You will receive a reminder email from SignUp Genius three days prior to your scheduled *DNR Nature at School* program. Please read and follow the directions, so we all can have a successful program.
2. At least one day prior to your lesson, send your instructor the link to your Zoom/Google Meet/Skype/Teams for your lesson time. Starting 10 minutes early with just your instructor is encouraged.

Day of:

3. Make sure students have their sound muted and their cameras on to participate (with thumbs up, number on fingers).
4. If you use the chat feature, we encourage the students to ask their questions there, and the teacher can ask them at the end of the program.
5. See further directions in your SignUp Genius confirmation.

Nature at School NGSS Correlation

Hatchery to Habitat

Live from Wolf Lake State Fish Hatchery: Discover how and why the DNR raises and releases millions of fish into Michigan's lakes, rivers, and streams.

Guiding question/phenomenon:

What impact does fisheries management have on habitats and fish populations, and why?

Science and Engineering Practice	Disciplinary Core Idea	Cross-Cutting Concepts
Analyzing and Interpreting Data Analyze data using tools, technologies and/or models in order to make valid and reliable scientific claims or determine an optimal design solution. • Students will understand and be able to apply how biologists predict, and increase, fish populations based on collected data and modeling.	**LS1.B: Growth and Development of Organisms** Adult plants and animals can have young. In many kinds of animals, parents and the offspring themselves engage in behaviors that help the offspring to survive. • Students will study the life cycle of Michigan fish, and determine what factors influence survival.	**Systems and Systems Models** A system can be described in terms of its components and their interactions. • Students understand that biologists work in the ecosystem to increase fish populations, for human recreation and ecosystem health.
	LS2.C: Ecosystem Dynamics, Functioning, and Resilience Ecosystems are dynamic in nature; their characteristics can vary over time. Disruptions to any physical or biological component of an ecosystem can lead to shifts in all its populations.	**Stability and Change** Small changes in one part of a system might cause large changes in another part.

Recommended grade band(s): Upper elementary through high school
All Nature At School virtual programs have been created to introduce students at any grade level to life and/or earth science core ideas, when used with pre- and post-activity suggestions.

Nature at School
Post-lesson
Hatchery to Habitat

Activity wrap-up:

Michigan boasts world-class fishing opportunities through careful management of fish and aquatic habitat. By learning about how and why fish are raised at the hatcheries, as well as understanding the complexity of fisheries management rooted in scientific processes, we gain a better understanding of all conservation and natural resource management in Michigan.

Fisheries management is a complex system that requires science, research, ingenuity, and expertise to make sound decisions that benefit Michigan's citizens and natural resources, now and for generations to come.

Resources:

- Putting Up Eggs: What happens to the eggs once they arrive at the fish hatchery?
- Floating Eggs: How do biologists sort out the good eggs from the bad eggs?
- "Fish of Michigan Field Guide" by Dave Bosanko. Learn to identify Michigan fish with this easy-to-use book that is also waterproof for use in the field.

Connect to Home:

- Go fishing! The DNR website has lots of great how-to-fish videos, maps, and other resources to help you and your family go fishing in Michigan - check it out!
- "Adventures with Jonny: Let's Go Fishing" by Michael DiLorenzo: This book is good for both children and adults. It provides a beginner, step-by-step guide to help build fishing confidence and intrigues children with the wonders of fishing.
- Fishy Who's Who: Research native fish in your area and write up fish biographies..
- Gone Fishing: Go fishing to conduct a field investigation about local fish species and habitats.

Post-activities:

The following activities can be found in the Salmon in the Classroom Teacher Activity Guide:

- **Fish Finder** (page 73): Students will learn how to identify different fish of the Great Lakes and how to use a dichotomous key. Students will also learn about the physical characteristics of fish and how they help fish adapt to their environment.
- **Pin the Parts on the Salmon** (page 81): Students will be able to identify the different parts of a fish and their function.
- **Fashion a Fish** (page 85): Students will classify fish according to shape and coloration. Students will describe adaptations of fish to their environments, describe how adaptations can help fish survive in their habitats and interpret the importance of adaptation in animals by designing a fish adapted for various aquatic habitats.

Connect with DNR content:

For a daily dose of nature, like MiNatureDNR on Facebook.

Visit the DNR Nature at Home page for educational video series, resources, lessons, virtual tours and more.