

# Lake Layers & Fish Function



Audubon Center  
of the North Woods

**Purpose:** Students will be introduced to the properties that make water unique, the basic components of lake function, adaptations of fish. Students will collect hands-on data from the lake, observe fish up-close, and go fishing!

## Concepts:

- Water is most dense at 4 degrees C or 39.2 F
- Lakes have distinct layers, separated by temperature
- Eutrophication is a process of nutrients being added to lakes
- Fish have different body shapes to be successful in their habitat and lifestyle.

## Learning Outcomes: Students will be able to

- Describe why ice floats
- Demonstrate how a lake “turns over”
- Determine the Trophic Status Index of Grindstone Lake

## Minnesota Academic Standards:

### Science

2.2.1.2.1 Observe, record and recognize that water can be a solid or a liquid and can change from one state to another and that the amount of water stays the same when it melts and freezes.

4.2.3.1.1 Describe the transfer of heat energy when a warm and a cool object are touching or placed near each other.

5.1.1.2.2 Identify and collect relevant evidence, make systematic observations and accurate measurements, and identify variables in a scientific investigation.

7.4.3.2.3 Recognize that variation exists in every population and describe how a variation can help or hinder an organism’s ability to survive.

7.4.4.1.2 Describe ways that human activities can change the populations and communities in an ecosystem.

**Class Length:** 3 Hr

**Ages:** 4th grade & up

**Season:** open water season

**Group Size:** ~15-20

**Safety:** Hiking from barn to dock at the intern beach. Walking on the dock. Casting and baiting fishing hooks.

**Materials:** Classroom box, posters, sand drawers

**Pre-class Prep:** Water needs to be boiled and cooled, make sure ice for density for kettle lake is frozen

**Class Outline: (Class sequence of events)**

- I. Ten Minutes to Teaching
- II. Introduction
- III. Class Experiences
  - A. Adventures in Density (10 min.)
    - i. Feather vs. Lead
    - ii. Water vs. Ice
    - iii. Hot vs. Cold Water
  - B. How are lakes formed? (15 min.)
    - i. Moraine
    - ii. Rock Depression
    - iii. Chunks of Ice
  - C. Eutrophication and Trophic Status? (45 min.)
    - i. Limnologists study lakes
    - ii. Grindstone Lake Study
    - iii. Eutrophication
    - iv. Determining Trophic Status Index
  - D. Stratification & Turnover (15 min.)
    - i. Grindstone Lake Temperatures
    - ii. Water Density
    - iii. Lake Layers and Turnover
  - E. Habitats and Adaptations of Fish (40 min.)
    - i. Habitats of Fish
    - ii. Adaptations of Fish
  - F. Fishing (40 min.)
- IV. Authentic Assessment (5 min.)
- V. Optional Activities (20+ min.)
- VI. The Sending (5 min.)
- VII. Appendix