



FISHERIES MANAGEMENT INDOOR LAB LESSON PLAN

Subject Area: Concepts behind fisheries management policy and regulations.

Grade Level: Middle School

Seasonal timing: Fall

Instruction Time: 45 minutes

- A. Learning Goal:** Learners will understand how complex ecological dynamics affect fish populations and how ecosystem balance is imperative for sustainable fisheries management.
- B. Objectives:**
- Understand the role of fisheries managers and the importance of population monitoring.
 - Explain the different functional groups of fish and their role in lake food webs.
 - Illustrate important ecological relationships using a conceptual model.
 - Use the provided case studies to compare and contrast fisheries management strategies.
 - Discuss fisheries regulations and the circumstances they are used to balance fish populations and ensure sustainable harvest.
- C. State Standards:**
- SCI.CC4.m – Students understand systems may interact with other systems: They may have sub-systems and be a part of larger complex systems. They use models to represent systems and their interactions — such as inputs, processes, and outputs — and energy, matter, and information flows within systems. They also learn that models are limited in that they only represent certain aspects of the system under study
 - SCI.CC7.m – Students explain stability and change in natural or designed systems by examining changes over time and considering forces at different scales, including the atomic scale. They understand changes in one part of a system might cause large changes in another part, systems in dynamic equilibrium are stable due to a balance of feedback mechanisms, and stability might be disturbed by either sudden events or gradual changes that accumulate over time.
 - SCI.SEP2.m – Developing and Using Models
 - SCI.LS1.B.m – Animals engage in behaviors that increase the odds of reproduction. An organism’s growth is affected by both genetic and environmental factors.
 - SCI.LS2.A.m – Organisms and populations are dependent on their environmental interactions both with other living things and with nonliving factors, any of which can limit their growth. Competitive, predatory, and mutually beneficial interactions vary across ecosystems but the patterns are shared.

- SCI.LS2.C.m – Ecosystem characteristics vary over time. Disruptions to any part of an ecosystem can lead to shifts in all of its populations. The completeness or integrity of an ecosystem’s biodiversity is often used as a measure of its health.
- SCI.LS2.D.m – Changes in biodiversity can influence humans’ resources, such as food, energy, and medicines, as well as ecosystem services that humans rely on — for example, water purification and recycling.
- SCI.LS4.D.m – Changes in biodiversity can influence humans’ resources and ecosystem services they rely on.

D. Setting: Indoor classroom.

E. Materials/Resources:

- Lab pages and writing utensil (1 per student).
- Fisheries conceptual model handout (1 per student).

F. General delivery, see teacher guide for detailed implementation suggestions:

- Ask students to consider what fisheries management means and why we manage fish populations. Ask them about their experience with fishing regulations - why do some lakes have different management regulations than others?
- Examine the case studies provided in the lab pages. Have students discuss their ideas about why the fish regulations differ as pairs and then share out as a large group.
- Have students make a list about important factors that impact fish populations. Write key words on the board at the front of the room. Students then use the conceptual model handout to draw how all of these key factors are related and how they impact fish populations.
- Discuss definitions and strategies behind various fishing regulations and have students match the regulation type with the appropriate management strategy at the end of the lab.

G. Assessment:

- Have students examine the fishing regulations for a local lake they are familiar with or are interested in. Have them make predictions about the fish populations of that lake based on the regulations. Students could discuss restricted fishing season timelines, sizes of fish, or how big the populations are.