



WATER QUALITY OUTDOOR LAB LESSON PLAN

Subject Area: Water Quality
Grade Level: Middle School
Seasonal timing: Fall session
Instruction Time: 45 minutes

A. Learning Goal: Understand the importance of water quality and human impact, including personal behaviors, on our water resources.

B. Objectives:

- Conduct various water quality tests and record data on a water sample.
- Determine water quality based on chemical and physical factors.
- Relate water quality parameters to the health of the lake, including the impact on organisms.
- Discuss how personal behaviors and choices impact water quality in local water systems.

C. State Standards:

- 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.SEP3.m – Planning and conducting investigations.
- SCI.SEP4.m – Analyzing and interpreting data.
- 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.

D. Setting/Area: Local lake.

E. Materials/Resources: Students divided into small groups of 3-5.

- Water quality lab manual, clipboard, writing utensil.
- Life preservers for all participants.
- Pontoon boat and several large fishing boats.
- Cups or buckets for samples.
- Thermometer and Chemette kits or temperature and oxygen meter (e.g., YSI).
- pH paper.
- Secchi discs.
- Deep water sampler.
- Cameras.

F. Delivery:

- Review safety issues; e.g., proper fitting of life jackets, working in pairs, staying seated in the pontoon or boat when motoring.
- Motor to predetermined deep portion of lake.
- Demonstrate proper methods for acquiring data using meters, Secchi disk, pH paper.
- Have students collect data required on lab sheet, answer questions and collect lab sheets.

G. Assessment:

Have informal discussion regarding findings and their perception of the lake and its value.