

Class Summary

Quick Facts

Outside: 2 hours 20 minutes

Grade: 4-8th

Offered: Year-round

Physical Activity: 1 mile walk including a steep hill

Other: Expect students to be able to follow detailed written directions

Concepts

• Impact • Quality

• Accuracy • Dependence

[Minnesota Academic Standards >](#)

• Science • Math • Language Arts

[Classroom Activities >](#)

- Pre-Activity: *Getting to Know H₂O*
- Post-Activity: *Stalking Pollution*

STEM Components

- Analyze
- Collect Data
- Follow Procedures
- Investigate
- Technique (laboratory)
- Test

IB Profiles

- | | |
|---|--|
| <input checked="" type="checkbox"/> Inquirers | <input type="checkbox"/> Open-minded |
| <input checked="" type="checkbox"/> Knowledgeable | <input checked="" type="checkbox"/> Caring |
| <input checked="" type="checkbox"/> Thinkers | <input type="checkbox"/> Risk-takers |
| <input checked="" type="checkbox"/> Communicators | <input type="checkbox"/> Balanced |
| <input checked="" type="checkbox"/> Principled | <input type="checkbox"/> Reflective |

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Outcomes, students will:

1. Create a list of methods humans use in order to determine water quality.
2. Follow step-by-step written directions to complete three chemical tests on the water.
3. Be able to name several human actions that have a direct or indirect impact on water quality.

Brief Synopsis:

In warm weather, participants will journey to the banks of the Root River and in cold weather they will walk on water to explore secrets under the ice of the Eagle Bluff pond. Time is spent at the river or pond taking physical measurements and performing chemical tests to help determine the pond or river's water quality.

Outline:

Clean Water (20 minutes)

Everyone needs water in order to live, and most people expect to drink clean water. Students will start the class by helping their instructor complete a model of all the water in the world. How do we know when water is clean? We have to do lots of testing. Students will be introduced to the testing and equipment they will use for safe and accurate water quality testing.

At the Waters Edge (1 hour)

Using tools and water testing equipment students will measure the water's physical properties and chemical composition in order to determine the water's health. If the river or pond is found to be impaired, students will investigate the origins of the pollution and its effect.

The Chemistry of Water (1 hour)

It is often difficult to understand what is happening to water at the chemical level. Students will participate in games, activities, and demonstrations to help them understand their tests: causes of pH level changes, how nitrates get into the water, and the impact of dissolved oxygen on organisms living in the water.

Analyze the Data (20 minutes)

Students will develop an opinion about the health of the water they tested and state the rationale for their decision. Students will also discuss the possible pollution sources and predict what will happen if that pollution continues or gets worse.