

Water Quality Introduction

Time: 1 class period (40-45 min.)

National Benchmarks: Benchmarks 5A: Diversity of Life; 5D Interdependence of Life; 5E: Flow of Matter and Energy; 9B: Symbolic Relationships; 9D: Uncertainty; 12B: Computation and Estimation; 12D: Communication Skills; 12E: Critical-Response Skills.

National Science Content Standards: *Science as Inquiry: A; Life Science: C:* Biological Evolution; The Interdependence of Organisms; Matter, Energy, and Organization in Living Systems; *Science and Technology: E:* Abilities of Technological Design; Understandings about Science and Technology; *Science in Personal and Social Perspectives: F:* Population Growth; Natural Resources: Environmental Quality; Natural and Human-induced Hazards; Science and Technology in Local, National, and Global Challenges

New York State Standards: 1, 2, 3, 4, 5, 6, 7

Objectives: Students will understand the different aspects of water quality and be able to use water quality test kits to practice testing for pollutants.

Lesson Outline:

1. Students discuss pollution, what it means, and whether different water uses should have different standards.
2. Students practice using water quality tests in the classroom on prepared samples.
3. Students complete a water quality note-taking chart based on what they've learned.

Preparation: Obtain water samples, prepare laptop and powerpoint projector.

Materials: water samples in clear cups or beakers, water test kits, computer and projector for power point presentation, copies of note-taking sheet,

Engagement: Set out several samples of water. One should be tap water, one a bottled water, one should smell different, and one should be an odd color. Ask students if they would drink any of these waters? Ask students why they wouldn't drink the waters and record results on board. Ask what a weird smell or color could tell about the water. Ask students: If water is clear and doesn't smell, is it safe to drink? Ask students: would they swim in the water? Is drinking water different from water you swim in? Students might point out that you can swim in salt water but not drink it. Ask students about the animals that live in bodies of water such as lakes and rivers. What do they need to survive? What factors are important for them?

Exploration: Students will watch and discuss the powerpoint slides from "Water Quality Overview". They should use the accompanying sheet to take notes.

Divide students into lab groups and make sure that lab safety has been adequately discussed. Each group will rotate around the classroom, conducting water quality tests at each station. Depending on the types of kits you are using, some test kits will take longer

than others (for instance, dissolved oxygen, phosphate, and nitrate HACH kits take at least 10 minutes each). Make sure that students have something to do (or read) if they finish with their test kit early. A good alternative is to have microscopes set up with slides of pond water, so that students can observe any plankton in the water. Students should perform the water quality tests according to the directions enclosed in each kit and record their results on notebook paper. This preparation activity will allow you to take your students outside with the confidence that they can perform the tests safely and accurately.

Explanation: Depending on which variables you want to test, the background readings should provide enough information for you and the students. The following parameters are discussed:

- pH
- Dissolved Oxygen
- Phosphate
- Nitrate
- Chloride
- Macroinvertebrates
- Alkalinity
- Conductivity

Extension: Ask if any students have had a fish tank? If so, discuss the different issues that arise when taking care of a fish tank. What is the filter for? What are the bubbles? What tests do you have to do on the water?

Evaluation: Have students compare table with a partner, and then go over as a whole class. For homework, students should read the background reading entitled "Pollution".

Comments: