

## **Title**

Water Quality Testing

## **Overview**

Using LaMotte Water Monitoring Kits, students will test local river water for parameters such as dissolved oxygen, turbidity, alkalinity, phosphates, nitrates and temperature.

## **Objectives**

- Students will learn the importance for water quality testing
- Students will familiarize themselves with water quality monitoring terms and definitions
- Students will identify the point and nonpoint sources of pollution, and the effects it can have on river systems.
- Students will collect data, analyze results and draw conclusions about health of waterway
- Students are introduced to solutions on how to reduce certain pollutants from entering our
- Waterways

## **Key Terms**

- Best Management Practices- A practice, or combination of practices, that is determined to be an effective and practicable means of preventing or reducing the amount of pollution generated by nonpoint sources to a level compatible with water quality goals.

## **NGSS**

HS-LS2-6: Evaluate the claims, evidence, and reasoning that the complex interactions in ecosystems maintain relatively consistent numbers and types of organisms in stable conditions, but changing conditions may results in a new ecosystem.

HS-ESS3-4: Evaluate or refine a technological solution that reduces impacts of human activities on natural systems.

## **Materials**

- LaMotte Water Testing Kits
- Thermometer
- Protective goggles
- Bucket
- Sample water
- Dixie cup
- Dump Water station
- Eye washing station

- Hand washing station
- Data sheet (per group)
- Writing utensil (per group)

### **Preparation/Class set-up**

- Become familiar with background knowledge of each test and its procedures
- Separate students into groups
- Testing kits are set up with directions placed underneath
- Dump water, eye wash, and hand wash stations set-up

### **Activity**

Start with the question, “*Why is it important to test for water quality?*” After some discussion, go through each chemical and physical test, providing the class with background information on each testing kit. Point out dump station, eye washing, and hand washing stations. Assign two students retrieve water, with a LL&W crewmember, from the side of the barge with a bucket on a string. During this activity, students are required to wear their safety goggles at all times. Is it important to remind students to read directions thoroughly before starting the experiments; this will ensure all tools and chemicals are available in the testing kits.

Each group completes a test, writes their results on the white-board, and then chooses their next test. Teachers will walk around the room and aid the students in their experiments. Leave enough time for discussion before the end of class.

### **Assessment**

After testing kits and goggles are put away, go over results. Facilitate discussion with questions such as:

- What patterns can we identify from the data we’ve collected?
- Why might we have gotten the results we did for [phosphates/DO/etc.]?
- Why did some results differ from others?
- What could have contributed to high dissolved oxygen levels?
- What determines alkalinity levels?
- What time of year would the river experience the highest nitrate and phosphate levels?

Students should brainstorm solutions on how to decrease nitrate and phosphate levels and sediment load into waterways. After some discussion, show examples of best management practices that are currently set in place.

**Call to Action**

What can student do at home or at school to take care of their watershed?

**Extensions**

- Follow up this class with Macroinvertebrate Identification for other ways to test for water quality
- Show the processes water travels through a water treatment facility
- Field trip to a water treatment facility