



Comparison of Water Quality Parameters

High School Physical Science | Fall Module 2 | Lake Lotus Park

NGSSS Big Idea: Body of Knowledge—Life Science

NGSSS Big Idea: Standard 17—Interdependence

Discuss the need for adequate monitoring of environmental parameters when making policy decisions.

Benchmark Code & Description:

SC.912.L.14.6—Explain the significance of genetic factors, environmental factors and pathogenic agents to health from the perspective of both individual and public health.



LEARNING GOAL/OBJECTIVE

Students will be given a sample from an unknown source and will infer from test results the source of water.



PREREQUISITES

Review:

- Vocabulary Words
- Applicable Textbook Sections
- Water Quality Worksheet



VOCABULARY

- Chlorine
- Conductivity
- pH
- Dissolved Oxygen
- Temperature
- Turbidity
- Phosphorous
- Nitrate



HANDS-ON ACTIVITY

Task(s):

Students will use portable meters to test water quality parameters.

Provided Materials:

- Clipboard
- Safety Glasses
- Labquest Meter
- Sampling Worksheet
- Colorimeter
- Meter Probes: Nitrates, Phosphates, Turbidity, pH
- Pencil
- Water Meter
- Dissolved Oxygen, Chlorides
- Gloves
- Nitrate Test Strips

Career Options: Engineer, Operator, Scientist, Park Ranger

Lesson Steps:

1. Students will be split into 3 groups.
2. Instructions will be given for tests/meters.
3. Students will rotate through 3 stations and record test results on the worksheet provided.
4. Each group will have a student that will double check earlier samples using the Labquest meter.
5. Instructors will ask the following questions to the students as a wraparound to the module:
 - How is Dissolved Oxygen content affected by temperature?
 - pH is a measure of what?
 - How does phosphorus and nitrogen affect water quality?

Water Quality Worksheet

Water Quality Parameters	Unit of Measure	Lake Lotus Sample #1 Results	Lake Lotus Sample #2 Results	Lake Lotus Sample #3 Results	Range for Water Sources		
					Lake Water	River Water	Rain Water
pH	1-14				6.60-7.94	6.75-6.78	5.5-7.0
Dissolved Oxygen	mg/L				2.97-10.5 mg/l	99.99-999.91 mg/l	<3 mg/l
Temperature	° Fahrenheit				71.60-75.20° F	41.72-91.40° F	32-90° F
Phosphorus	Mg/L				10.00-162.00 mg/l	2.00-25,100 mg/l	<0.02 mg/l
Nitrate	ppm				0-5 ppm	0-15 ppm	0-15 ppm

Note: M = 10^{-6}
 m = 10^{-3}
 ppm = parts per million



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DATA RECORD

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Note: M = 10⁻⁶ m = 10⁻³ ppm = parts per million