

Water Quality Monitoring (NFCC)

Teacher's Guide

Subject: Integrated Science (Life; Earth-Space; Physical)

Topic: Water Quality monitoring, watersheds.

Summary: Students will use various types of water monitoring equipment to explore selected to gain a better understanding of the dynamics of surface water compared to ground water, and how they are connected. Special emphasis will be paid to changes in dissolved oxygen.

Objective(s): After completing the field lab, students will be able to:

1. Operate selected water quality field equipment
2. Collect and interpret water quality data

Ecosystem(s): Rivers, Springs

Equipment:

- Lamotte water sampler
- Armored thermometer
- Refractometer
- X tech pen
- pH test kit
- Transparency tube
- D.O. Kit
- Data sheet & clipboard

Background

- Vocabulary: Dissolved Oxygen, parameters, water quality, watershed
- Reference Material: Healthy Water Healthy People parameters
- Equipment Training: D.O. test kit

Procedure (Engage; Explore; Explain)

1. Engage the students by asking a specific question that gets to the heart of the activity: What is the major difference between surface water and ground water?
2. Use the students' answers to ascertain what they already know, clarify any misconceptions; Ask them to formulate their own hypothesis relating to their own expectations of the outcome of the lab.
3. Follow the procedures for the water quality equipment. Fill out the data sheet accordingly.
4. After completing the lab, allow the students to answer the discussion questions as a group and explain their answers relating them to the concepts, processes and skills associated with the activity. Students should record their answers individually. At this time, facilitators can introduce/explain the specific concepts and explanations in a formal manner.

Sunshine State Standards:

Science: SC.7.N.1.1; SC.7.E.6.6

Language Arts: LA.7.4.3.1,2; LA.7.4.2.2

Mathematics: MA.7.S.6.1;

Social Studies: SS.B.1.3.1; SS.B.2.3.6, 9

Water Quality Monitoring (NFCC)**Student Data Sheet**

Full Name:		Science Teacher:	
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Student Hypothesis and Rationale

- A. I hypothesize that **water temperature** will vary the most between the two lakes.
- B. I hypothesize that **pH** will vary the most between the two lakes.
- C. I hypothesize that **transparency** will vary the most between the two lakes.

My Hypothesis was Supported or Not Supported**Field Observations/Measurements/Data**

Location: Far Lake

	Group 1	Group 2	Group 3	Average
Date:				
Time:				
Weather conditions:				
Cloud cover:				
Air Temperature:				
Water temperature:				
Transparency:				
pH				

Location: Wood Duck Pond

	Group 1	Group 2	Group 3	Average
Date:				
Time:				
Weather conditions:				
Cloud cover:				
Air Temperature:				
Water temperature:				
Transparency:				
pH				

Water Quality Monitoring (NFCC)

Assessment

1. What was the pH at the Wood Duck Pond?

2. According to your group's data, which parameters changed the most between the two lakes? The pH, the water temperature, or the transparency?

3. Look at your Hypothesis. Was your hypothesis supported by your data? On the first page circle whether your hypothesis is supported or not. Explain which parameter changed the most and why you think this is.

4. How does the transparency of the water affects the growth of plant life? Explain some factors that would cause the transparency to decrease.

5. Think about some human causes of the decrease in water quality. Describe some effects these human influences could have and affect on the water quality in your area.

6. Think about the observations you have just made. Did the activity raise new questions? Write a short question (start with "What, Why, Where, When, or How") about something you want to learn more about.

Water Quality Monitoring (Physical Parameters)

Reference Chart

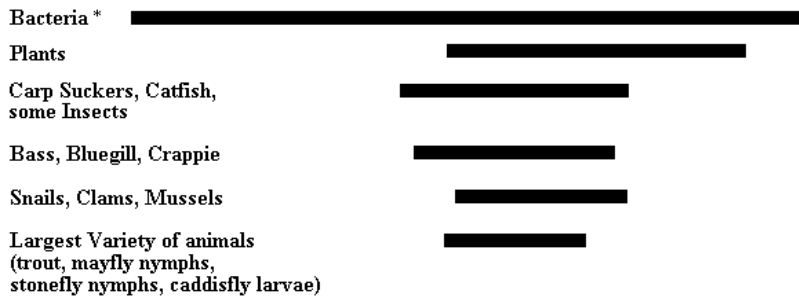
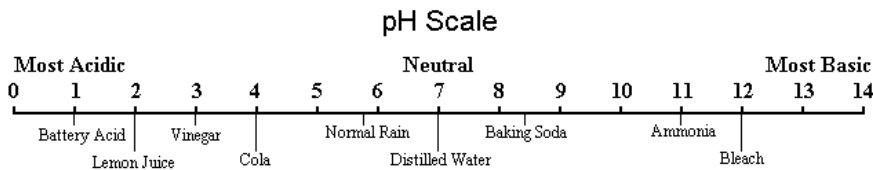
Temperature: preferred temperature range for aquatic organisms

Bacteria	Live in all temperatures!
Algae and other green water plants	55- 100 degrees F 13-38 degrees C
Most aquatic animals	55-100 degrees F 13 – 38 degrees C
* Best range for a healthy aquatic ecosystem	55-80 degrees F 13 – 26 degrees C

pH: preferred pH ranges of aquatic organisms

Bacteria	1.0 – 13.0
Algae and other green plants	6.5 – 13.0
Lower animal forms like snails	7.0 – 9.0
Most aquatic animals * Best range for a healthy ecosystem.	* 6.5 – 7.5

Acids have a low pH, Bases have a high pH



*Line indicates the pH level at which the selected organism(s) can survive.

Clarity or Transparency- the measure of how deep light can penetrate through a body of water.
Secchi disk in meters

