

## Water Quality Monitoring (Physical Parameters)

## Teacher's Guide

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

**Topic:** Record keeping and sampling of abiotic factors within an ecosystem.

**Summary:** Students will use various types of equipment to explore selected parameters of water quality to gain a better understanding of the dynamics of the abiotic factors influencing Freshwater and the inhabitants that reside in this ecosystem.

After completing the field lab, students will be able to:

**Objective(s):**

1. Describe the importance of recording physical parameters when monitoring water quality.
2. Use water quality equipment properly and record data using proper units of measurement.

**Ecosystem(s):** Lakes/Rivers/Springs

### Equipment:

- Lamotte water sampler
- Armored thermometer
- Refractometer
- X tech pen
- pH test kit
- Transparency tube
- GPS units
- Measuring tape
- Flow meter

### Background

- Vocabulary: Parameter, Transparency,
- Reference Material: Healthy Water Healthy People
- Equipment Training: GPS

### Procedure (Engage; Explore; Explain)

1. Engage the students by asking a specific question that gets to the heart of the activity: Why is temperature important in water quality monitoring? What about color? What can color tell you? Let's look at how all the parameters influence each other...
2. Use the students' answers to ascertain what they already know, clarify and misconceptions, and then ask them to formulate their own hypothesis relating to their own expectations of the outcome of the lab.
3. Follow the data sheet and take each parameter in order. Be sure that everyone gets a chance to do at least one "job".
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; SC.7.L.17.3

**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 (Physical Parameters)

# Student Data Sheet

## General Information

Full Name:		Science Teacher:	
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## Student Hypothesis and Rationale

If velocity is the water flow then it will be (Choose one: faster or slower) at the spring vent compared with downstream because... \_\_\_\_\_

## Field Observations/Measurements/Data

	Group name	Group name	Group name
Location:			
Date:			
Time:			
Weather conditions:			
Cloud cover:			
Air Temperature:			
Water Type: Ground water/ surface water			
Karst Feature:			
Depth of water sample:			
Water temperature:			
Color of water:			
Transparency:			
pH:			
Conductivity:			
Flow:			

## Water Quality Monitoring (Physical Parameters)

## Assessment

1. What was the water temperature at your location?

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2. What was the difference in air temperature compared to water temperature at you location? How would this differ if the air temperature was much cooler?

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3. Was your hypothesis supported by your data? Whether your hypothesis is supported or not, what can you infer from your observations, measurements, and results?

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4. How would the water flow at Wakulla Springs change if the water table dropped considerably?

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5. What are some human influenced activities that could decrease the transparency of the water? Explain how these would change the transparency.

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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.

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## Water Quality Monitoring (Physical Parameters)

## Reference Chart

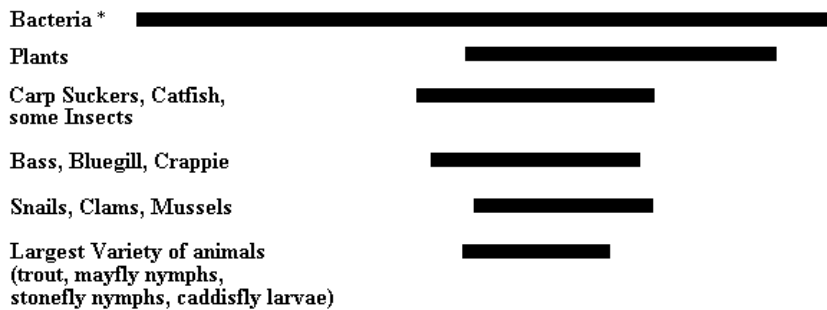
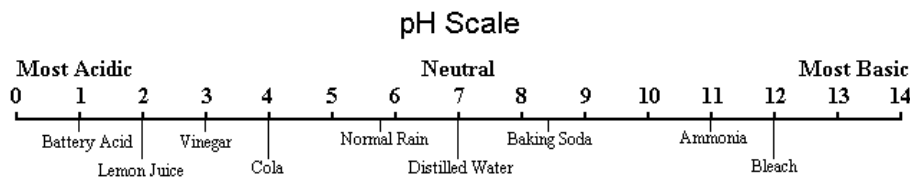
### Temperature: preferred temperature range for aquatic organisms

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

