



Monitoring the Environment

High School Physical Science | Fall Module 3 | Lake Lotus Park

NGSSS Big Idea: Standard 17—Interdependence

- A. The distribution and abundance of organisms is determined by the interactions between organisms, and between organisms and the non-living environment.
- B. Energy and nutrients move within and between biotic and abiotic components of ecosystems via physical, chemical and biological processes.
- C. Human activities and natural events can have profound effects on populations, biodiversity and ecosystem processes.

NGSSS Big Idea: Standard 18—Matter and Energy

- A. All living things are composed of four basic categories of macromolecules and share the same basic needs for life.
- B. Living organisms acquire the energy they need for life processes through various metabolic pathways (primarily photosynthesis and cellular respiration).
- C. Chemical reactions in living things follow basic rules of chemistry and are usually regulated by enzymes.
- D. The unique chemical properties of carbon and water make life on Earth possible.

Benchmark Code & Description:

SC.912.L.17.13—Discuss the need for adequate monitoring of environmental parameters when making policy decisions.



LEARNING GOAL/OBJECTIVE

Discuss the need for adequate monitoring of the environment.



PREREQUISITES

Review:

- Vocabulary Words
- Florida LAKEWATCH—
www.lakewatch.ifas.ufl.edu
- Applicable Textbook Sections
- Seminole County Water Atlas—
www.seminole.wateratlas.usf.edu



VOCABULARY

- Sustainability
- Ecosystem
- Secchi Disk
- Stream Discharge
- Turbidity
- Watershed
- Cubic Meter
- Field Siphon
- Biological Magnification
- Ecological Footprint



HANDS-ON ACTIVITY

Task(s):

Students will take readings of depth, temperature and velocity from the Little Wekiva River and depth, turbidity and concentration of suspended matter from Lake Lotus.

Provided Materials:

- Secchi Disk
- Velocity Meter
- Water Siphon Filter
- Thermometer
- Clipboard/log sheets/pencils
- Labquest Meter
- Meter Probes: Nitrates, Phosphates, Turbidity, pH, Dissolved Oxygen, Chlorides

Career Options: Marine Biologist, Park Ranger, Ecologist, Wildlife Biologist, Research Scientist

Lesson Steps:

1. Discuss the impact of human interaction on the Little Wekiva River and its watershed.
2. At site #1, use tools to measure temperature, depth and water flow of the river. Discuss results and water velocity equation.
3. At site #2, check depth and turbidity using the Secchi Disk. Run lake water through a field siphon to capture organic and nonorganic materials.
4. Discuss ecological footprint and sustainability.
5. Discuss how technology is enabling us to monitor the environment more easily and efficiently.



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DATA RECORD

Site #1—Little Wekiva River

Temperature	
River Depth	
Flow Velocity	

Site #2—Lake Lotus

Turbidity	
Lake Depth	

Discharge Rate Equation: Discharge (Q) = Cross Sectional Area (A) x Flow Velocity (V)

$$\underline{\hspace{2cm}} \quad Q \quad = \quad \underline{\hspace{2cm}} \quad (A) \quad \times \quad \underline{\hspace{2cm}} \quad (V)$$

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