

Seminole County Water Atlas Learning Kit

How Healthy Is Your Lake? Handout

Students practice their skills while learning about water quality indicators in different lakes.

Water Atlas Curriculum Lesson 18

Florida Lake Health and the Trophic State Index

Topic: How can you tell if a lake is healthy? Lakes with many different kinds of plants and animals are usually healthier than lakes with only a few different species. So one way to measure a lake's health is to count the different kinds of organisms living there. Another method is to test samples of the lake water for plant nutrients. Nutrients like nitrogen and phosphorus are required for healthy plant growth. But too high a level of nutrients can lead to trouble. Therefore, the amount of nutrients in the water can provide clues about the lake's health. The table below shows how a lake's health correlates to these nutrient levels.

TROPHIC STATE INDEX (TSI)

Scientific Name for Lake Health	What the Name Means	Trophic State Index (TSI)	Florida Lake Rating
Oligotrophic	Lacking nutrients	0-49	Good
Mesotrophic	Some nutrients	50-60	Good
Eutrophic	Rich in nutrients	61-69	Fair
Hypereutrophic	Extremely rich in nutrients	70-100	Poor

A "good" TSI (Trophic State Index) reading (0-60) means that the lake has low to medium nutrient levels. In other words, there are enough nutrients for a variety of plants to grow, but not so many that the plants grow out of control. A "fair" TSI reading reflects a high level of nutrients in the lake. These nutrients may allow a few of the plant species to grow so much that they take over all of the space, pushing out the other plants and choking the waterway so boaters cannot pass. A "poor" rating means that there are far more nutrients than the lake actually needs. Lake Apopka, for example, has a "poor" rating and Lake Butler has a "good" rating.

How do lakes end up with too many nutrients? Fertilizers and pet waste can contribute to this situation when they wash into the lake after a strong rain. If even a few landowners use too much fertilizer on their yards, these nutrients can damage the entire water body. Community members must work together to make sure their lakes stay healthy. If you live in Seminole County and would like to investigate the health of a lake near you, visit the [Seminole County Water Atlas](#) website. Type in the name of your lake to see the lake's TSI, its size, photographs of the lake, and more.

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Reading Practice

Short response:

1. The above article, "How Healthy is Your Lake", describes a relationship between the TSI and lake health. Use details and information from the article to describe this relationship.

2. According to the article, which of the following is a TSI range?
 - a) Oligotrophic
 - b) Lacking Nutrients
 - c) 0 – 49
 - d) Good
3. The article states that Lake Apopka has a "poor" rating. Which of the following represents the potential TSI range for this lake?
 - a) 0 – 49
 - b) 50 – 60
 - c) 61 – 69
 - d) 70 – 100

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Short Response:

4. Assume that the author must eliminate one column from the table in this article. Decide which column could be eliminated without removing information the reader needs to understand the meaning of the Trophic State Index (TSI). Explain why you chose to eliminate this column.

Writing Practice

1. Scientists measure lake health to make sure that people are not damaging lake ecosystems. Imagine your school's grounds committee has to decide whether to use a lot of fertilizer on the grass next to the school's lake for greener grass, or plant different plants that don't need fertilizer next to the lake to keep the lake healthy. Explain which choice you think your school would make and the reasons for this choice.
2. Lakes with high levels of nutrients are often choked with plants. Imagine that you are a duckling trying to swim through the tangle of plants. Write a story about the challenges you face on your journey across the lake.
3. Lakes that rate as "poor" often have fewer plant and animal species than lakes rated as "good." Imagine two lakes, one edged with only one kind of tall waving grass and the other with a mixture of grasses and other plants. Explain which you would find more appealing in your neighborhood.
4. When plants grow out of control they can cover the surface of a lake, blocking out sunlight. Imagine that you are a fish living in a lake being covered by plants. Write a story about the day that the sun's light is completely blocked out.

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Math Practice

TSI IN SEMINOLE COUNTY LAKES

Lake Name	Lake Size	Most recent TSI / Rating	Historic Range / Rating
Lake Ada	51.13 acres	50 / Good	35-57 / Good
Bear Lake	311 acres	25 / Good	13-52 / Good
Banana Lake	17.70 acres	62 / Fair	22 / Good - 62 / Fair

- Which lake has the greatest Historic Range?
 - Banana Lake
 - Lake Ada
 - Bear Lake
 - They are all equal in range
- For the three lakes in this table, which lake is at its worst TSI rating in history?
 - Bear Lake
 - Banana Lake
 - Lake Ada
- For the three lakes in this table, which has the best TSI ratings overall?

Answer: _____