

How Healthy is Your Lake? *Handout*

Students practice for the FCAT while learning about water quality indicators in different lakes.

FLORIDA LAKE HEALTH AND THE TROPHIC STATE INDEX

How can you tell if a lake is healthy? Lakes with many different kinds of plants and animals are usually more healthy 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. However, very high levels of nutrients can lead to trouble. As a result, the amount of nutrients in the water can provide clues about the lake's health. The table below shows how a lake's health is tied to these nutrient levels.

TROPHIC STATE INDEX (TSI)

<i>Scientific Name for Lake Health</i>	<i>What the Name Means</i>	<i>Trophic State Index (TSI)</i>	<i>Florida Lake Rating</i>
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 too much, filling up all of the space. They force out the other plants and choke the waterway so boaters cannot pass. A "poor" rating means that there are far more nutrients than the lake actually needs. Lake Jesup, for example, has a "poor" rating. A 1999 plant study reported that this lake could only support 36 plant species. Nearby, Bear Lake, which has a "good" rating, supports 52 different kinds of plants!

How do lakes end up with too many nutrients? Fertilizers and pet waste add nutrients when strong rains wash these pollutants into lakes. If even a few landowners use too much fertilizer on their yards, it 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 Watershed Atlas Website. Type in the name of your lake to see the lake's TSI, its size, a photograph of the lake, which plants and animals live there, and more. Check it out by visiting www.Seminole.WaterAtlas.org.

Name:

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FCAT-FRIENDLY READING QUESTIONS:

1. The article 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 Jesup 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

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 this column. _____

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FCAT-FRIENDLY WRITING PROMPTS

- Using excess fertilizers near a lake can damage the lake's water quality. Imagine that your school is trying to decide whether they should use extra fertilizer on the grass OR replace the grass with plants that don't need fertilizers. Write to explain which choice you think your school would make and the reasons for their choice.
- Lakes with high levels of nutrients are often choked with plants. Imagine that you are a duckling trying to swim through a tangle of plants. Write a story about the challenges you face on your journey across the lake.
- Lakes that rate "poor" often have fewer plant and animal species than lakes rating "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. Write to explain which you would find more appealing in your neighborhood.
- 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.

FCAT-FRIENDLY MATH QUESTIONS

TSI in Seminole County Lakes

<i>Lake Name</i>	<i>Lake Size</i>	<i>TSI in May 2004/ Rating</i>	<i>Average TSI in the Past / Rating</i>
Bear Lake	310 Acres	35.98 / Good	34.66 / Good
Lake Cochran	69 Acres	41.98 / Good	42.32 / Good
Lake Harney	6268 Acres	63.11 / Poor	56.30 / Fair
Lake Jesup	8120 Acres	73.14 / Poor	72.88 / Poor
Lake Monroe	8953 Acres	70.12 / Poor	61.22 / Poor

- Which lake shows the greatest difference between the May 2004 TSI rating and the average past TSI rating?
 - Bear Lake
 - Lake Cochran
 - Lake Harney
 - Lake Monroe

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2. For the five lakes in this table, which lake represents the median TSI rating for May 2004?
 - a) Bear Lake
 - b) Lake Cochran
 - c) Lake Harney
 - d) Lake Monroe

3. Which of the following number sentences represents the relationship between the size of lake Cochran and the size of Lake Jesup?
 - a) Lake Cochran is 26 times as big as Lake Jesup
 - b) Lake Jesup is 26 times as big as Lake Cochran
 - c) Lake Cochran is 118 times as big as Lake Jesup
 - d) Lake Jesup is 118 times as big as Lake Cochran

4. For the five lakes in this table, what was the average TSI reading in May 2004? Be sure to show your work and round your answer to the nearest tenth.

Name:

Date: