

Grade 7-8

Title- Turbidity Testing by Jodi Berry

Turbidity is a measure of the cloudiness of water- the cloudier the water, the greater the turbidity. Turbidity in water is caused by suspended matter such as clay, silt, and organic matter and by plankton and other microscopic organisms that interfere with the passage of light through the water. Turbidity is determined by how much of the light traveling through water is scattered by suspended particles. The scattering of light increases with increasing suspended solid and plankton content. Turbidity will be measured using a turbidity sensor probe with the Pasco data collector.

Objectives- Students will compare and analyze the turbidity of water samples.

Alignment with MLR:

**Science and Technology**

## **B. ECOLOGY**

**Students will understand how living things depend on one another and on non-living aspects of the environment.** *Balance in ecosystems is based on an intricate web of relationships among populations of living organisms and on non-living factors such as water and temperature. Changes in specific populations or conditions affect other parts of the ecosystem. Individual systems continually change in response to human and other factors.*

MIDDLE GRADES 5-8

2. Analyze how the finite resources in an ecosystem limit the types and populations of organisms within it.
5. Describe various mechanisms found in the natural world for transporting living and non-living matter and the results of such movements.

## **J. INQUIRY AND PROBLEM SOLVING**

**Students will apply inquiry and problem-solving approaches in science and technology.** *Scientific inquiry, problem solving, and the technological method provide insight into and comprehension of the world around us. A variety of tools, including emerging technologies assist, the inquiry processes. Models are used to understand the world.*

MIDDLE GRADES 5-8

Make accurate observations using appropriate tools and units of measure.

1. Design and conduct scientific investigations which include controlled experiments and systematic observations. Collect and analyze data, and draw conclusions fairly.
2. Verify and evaluate scientific investigations and use the results in a purposeful way.

## **K. SCIENTIFIC REASONING**

**Students will learn to formulate and justify ideas and to make informed decisions.**

*This involves framing and supporting arguments, recognizing patterns and relationships, identifying bias and stereotypes, brainstorming alternative explanations and solutions, judging accuracy, analyzing situations, and revising studies to improve their validity.*

MIDDLE GRADES 5-8.

6. Support reasoning by using a variety of evidence.
7. Show that proving a hypothesis false is easier than proving it true, and explain why.
8. Construct logical arguments.
9. Apply analogous reasoning.

## **L. COMMUNICATION**

**Students will communicate effectively in the applications of science and technology.** *Clear and accurate communication employs appropriate symbols and terminology, models, and a variety of media and presentation styles. Communication includes constructing knowledge through reflection, evaluation, refocusing, and critically analyzing information from a variety of sources. Individuals and collaborative groups must communicate effectively*

4. Make and use scale drawings, maps, and three-dimensional models to represent real objects, find locations, and describe relationships.

Assessment- Graph displaying collected data and analysis of the data.

Prior Knowledge/Skills-Students will have an understanding of turbidity, its meaning and the causes of poor turbidity levels.

Integration- Science and Technology

Modification- NA

Grouping- cooperative group; students will work in pairs or small groups depending upon the number of probes available.

Materials- water samples from studied lake

Tap water

Bottled water

Other various water samples

Turbidity probe and data logger

Student laptops

Strategies: Review with students the definition of turbidity. Elicit all knowledge on the subject from the class. Students will use the turbidity sensor to find the turbidity levels of water samples. Students will then create and analyze a graph of their data.

Game Plan:

1. Teacher will elicit prior knowledge and engage students in the task ahead. Ask the following questions: What are the causes of poor turbidity? What effect do you think the environment around our lake will have on the turbidity of this sample? How do you think the sample from our lake will compare to the other samples? Why?
2. Teacher will review the correct procedure for using the turbidity probe and entering the data into the program
3. Students will generate a hypothesis to answer the question of which water sample will have the highest level of turbidity.
4. Teacher will distribute water samples to students at their tables or set up at lab stations (make sure samples are labeled)
5. Students will use the turbidity probe to measure the turbidity of each sample.
6. The students will create a graph from the collected data (this is computer generated, students did not have to create on their own)
7. Students will analyze the graph to determine which samples had the highest and lowest turbidity values
8. Students will write a conclusion from their data either proving or disproving their hypothesis. Conclusion should be based on collected data and graph analysis.