

TEKS-Based Activity for Grade 5

What's in the Water

Description:

In this activity, students use data from a “water sample” to draw conclusions about the source of pollutants.

Time Frame:

1 lesson (45 minutes)

Correlation to Texas Essential Knowledge and Skills:

During this activity, students will be exposed to the following Texas Essential Knowledge and Skills:

Note: Some TEKS statements below end with a ; or *and* and nothing thereafter—this indicates that further TEKS statements follow but are not included here.

(5.11) Science concepts. The student knows that certain past events affect present and future events. The student is expected to:

- (B) draw conclusions about “what happened before” using data such as from tree-growth rings and sedimentary rock sequences; and

Note: The TEKS listed here are the main content TEKS for this activity; however, this activity may also cover additional content and process skills included in other TEKS.

Materials:

Blue, orange, yellow, red, and brown paper dots (see Advance Preparation)
Container to hold dots and represent the lake
Clear plastic cups (1 per student group)
Plastic spoons (1 per student group)
Glue sticks (1 per student group)
Lake Water Pollutants student investigation pages (included at the end of this activity)

Background Information:

Approximately 97 percent of the earth’s water is saltwater, and another 2 percent is frozen in glaciers. Because of this only about 1 percent of the earth’s water is usable. For this reason water quality is very important. Water quality is determined by measuring various factors, including pH, dissolved oxygen, sewage, and dissolved solids (things such as fertilizer). The pH of water can be measured using pH paper. Pure water has a pH of 7. Water with a low pH (0–6) is considered acidic, and water with a high pH (more than 7) is considered basic. Organisms cannot live in water that is too acidic or too basic.

The amount of dissolved oxygen in water is important because all living things—even those living in water—need oxygen in order to live. When fertilizers and

raw sewage (from faulty septic systems or farmland runoff) enter water systems, they can cause algae to grow. This is referred to as an “algal bloom.” As the algae die, dissolved oxygen is used up during their decomposition, reducing the amount available for aquatic organisms.

Advance Preparation:

1. Prepare a mixture of approximately 60% blue and 10% each of orange, yellow, red, and brown paper dots to represent water with pollutants. Use a hole puncher to make the paper dots out of colored paper or purchase dots at party supply shops. Completely mix the dots in the container representing the lake so each student group will receive a random sample.
2. Prepare copies of the Lake Water Pollutants student investigation pages for each student group.

Procedures:

1. Distribute one set of Lake Water Pollutants student investigation pages, glue sticks, plastic spoons, and plastic cups to each student group.
2. Ask students to use their cups to take a sample of “water” from the “lake.” Then have students sort the dots by color and record the number of each dot color under the correct pollutant name in the Lake Water Pollutants Data Table. Students should use the Dot Key for reference.

Note: Because each cup can hold a large sample, tell students to fill each cup only about one-third full. This will ensure students do not have too many dots to count.

3. Students should complete the Lake Water Pollutants graph for their group’s sample by gluing the appropriate colored dots on the graph to create the bars representing each pollutant and the lake water.
4. After completing the graphs, have students work in their groups to answer the questions. Then ask them to calculate the fractional portion of each pollutant in their sample.

Lake Water Pollutants

Student Investigation Pages

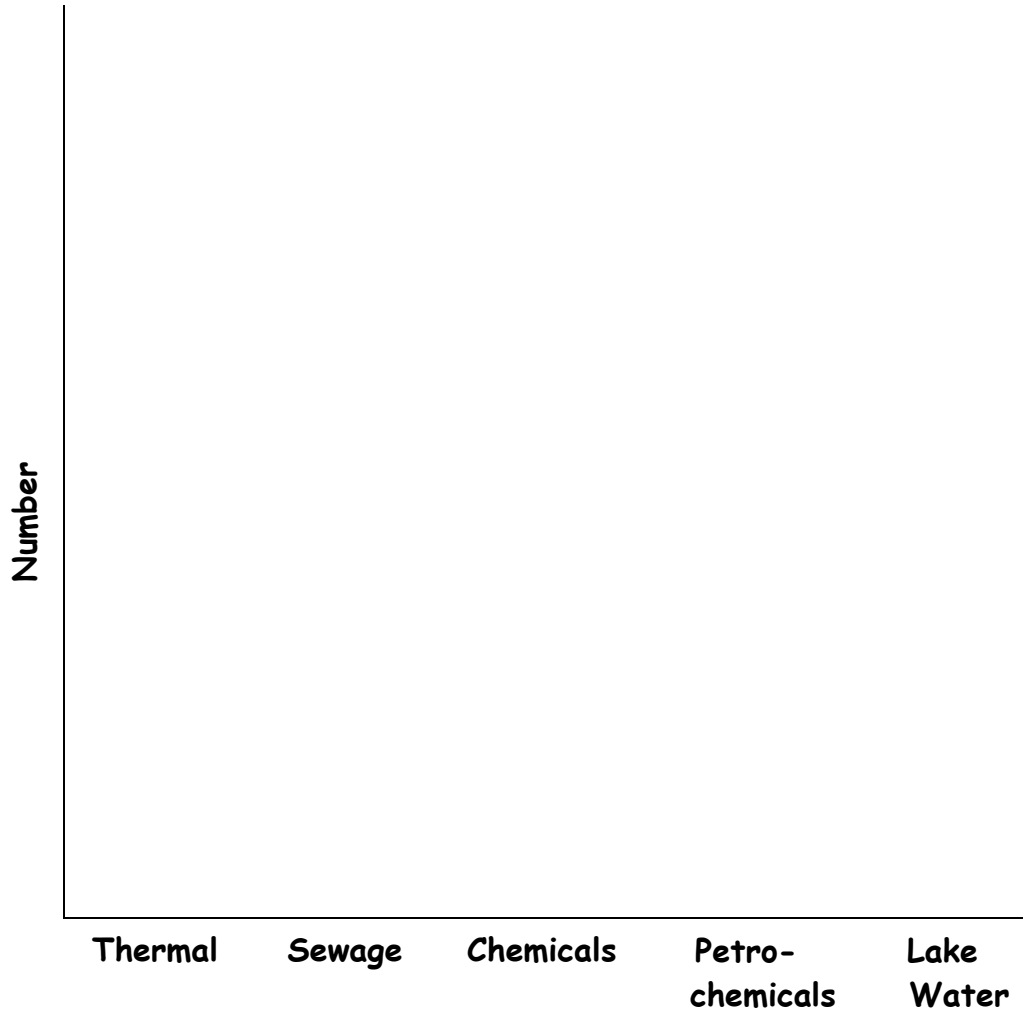
Data Table

Pollutants and Lake Water	Number of Dots
Thermal	
Sewage	
Chemicals	
Petrochemicals	
Total Pollutants in Sample	
Lake Water	
Total Pollutants and Lake Water in Sample	

Dot Key

Color	Pollutants and Lake Water
Orange	Thermal
Yellow	Sewage
Red	Chemicals
Brown	Petrochemicals (oil, gasoline)
Blue	Lake Water

Lake Water Pollutants Graph



Which pollutant is found in the greatest volume in your water sample?

How do you know?

What might be the source of the pollutant with the greatest volume?