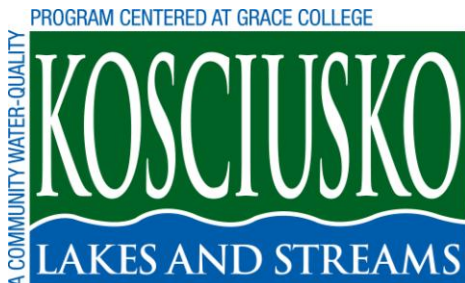


Water



A Natural Resource

A lesson on the natural history of water



Introductory Activity

Give each student a cup of water; let the discussion flow.

How much would you pay for a cup of water? Is water free?

What is in the water in the cup? Does it look clean?

Where could the water have come from?

Would you drink this water if it came from Lake Wawasee?

What is in the water in a lake that might make you not want to drink it?

What would you do to the water in the Tippecanoe River to make it safe to drink?

What could you use the water for besides drinking?

Where is new water being made? (Trick question!)

Could some of the water molecules in this cup at one time have been in the ocean or a glacier?

Is bottled water better than water from the faucet?

Lesson Objectives

1. Students will learn how much of the earth's water is fresh water.
2. Students will be able to explain the water (hydrologic) cycle and trace the pathway of water through the cycle.
3. Students will learn that the density of water changes.
4. Students will estimate how much water they use in one day.
5. Students will learn what happens to the water when it leaves their house.
6. Students will learn that some diseases are carried in water.
7. Students will list all the different ways a lake is or can be used by people.

Supplies Needed

1. Beaker
2. Salt
3. Food coloring
4. Transparency of the water cycle

Vocabulary

Runoff

Water table

Precipitation

Aquifer

Groundwater

Pollution

Water cycle

Transportation

Condensation

Spring

Density

Sewage

Activities

1. Have students make a graph showing that approximately 97% of the earth's water is salt water and that the remaining 3% is fresh water (this includes polar ice caps and glaciers).
 - a. Draw two lines. One line should be $6 \frac{1}{16}$ inches long and the other $\frac{3}{16}$ inch (to show 97% and 3%). Label the lines "salt water" and "fresh water)
 - b. Explain that these percentages are not likely to change.
2. Use a transparency or diagram to illustrate the water cycle.
 - a. Explain that the water in Kosciusko County lakes and streams is replenished by precipitation, surface runoff, and springs.
 - i. Some of the water that enters the lakes or streams comes from water treatment plants.
 - ii. This water has usually been pumped from wells that tap underground aquifers.
 - iii. Describe the water table as the upper surface of ground water. Below the water table the ground is saturated with water.
 - b. Explain that lake levels do not change significantly.
 - c. Explain how water is naturally purified through evaporation.
 - d. Explain why the northwest part of Kosciusko County experiences "lake effect snow.
3. Experiments with water (refer to Water Activity List provided):
 - a. Show that cold water is more dense than warm water and that salt water is more dense than fresh water.
 - b. Experiment to determine whether ice or liquid water is more dense.
 - c. Experiment to show how fresh water can be obtained from salt water.
4. Have students keep track of the amount of water they use in one day. Give the estimated amount in gallons.
 - a. The class should include a list of as many ways they can think of for how water is used where they live.
 - b. Find out how much water your school uses in one day.
5. Trace the path of waste water (sewage) from the house to the septic system (a way to treat sewage in rural areas) or a waste water treatment plant.
 - a. In both systems, decomposers work to make the waste water harmless to humans.
 - b. Water from septic systems is added to the ground water. Water from the waste water treatment plants is added to the water in streams and lakes.

6. Look for news articles that report beaches having to be closed or people having to boil their drinking water.
 - a. This may happen due to heavy rains that flood a water treatment plant, causing untreated sewage with harmful bacteria (pathogens) to enter a lake or stream.
 - b. It may also happen when untreated sewage from homes or waste from a farm that raises animals is either accidentally or intentionally dumped into a lake or stream, polluting the water.
7. Visit a waste water treatment plant.

Evaluation

1. Make a sketch of the water cycle. Use the following terms: Precipitation, surface runoff, groundwater, transportation, condensation.
2. List several ways that water can become polluted.
3. Explain how sewage is made harmless to people and the environment.
4. Think of some ways to reduce our demand for water.
5. Explain how water is purified in the environment.
6. Imagine yourself as a water molecule in the lake chosen by your class. Describe where you might have traveled after going through the water cycle many times. Be creative, but be scientific. (You may have fallen in various forms of precipitation. You may have passed through some living organisms.)
7. Tell how water is important in different ways for a farmer, a fisherman, a car wash business, and a marina owner.

Indiana State Standards for Education

- **Science**
 - **4.1.7** – Discuss and give examples of how technology has improved the lives of people.
 - **4.2.1** – Judge whether measurements such as volume are reasonable.
 - **4.3.3** – Identify salt as the major difference between fresh and ocean water.
 - **4.4.10** – Explain that if germs are able to get inside the body that they may keep it from working properly.
 - **4.5.5** – Explain how reasoning can be distorted by strong feelings.