



WATER WORKS:

CONSERVE! WATER USE, TRACKING & CONSERVATION

Students will learn how much water it takes to do basic activities at home, how often we waste water by letting it run and easy tips they can do to reduce water use. They will do an exercise to investigate how much water they use.

Activity time: 30 minutes and homework project

Grades: 3 – 12

Water Words: Energy and water conservation

Grade Levels: 3 through 7

Knowledge needed: Addition, multiplication, division and calculating averages

Materials - Teacher Demo:

- Gallon jug – filled with water
- 1 cup measuring cup
- *Simple Solutions to Great Lakes Health Guide*

Student Activity:

- Copies of Water Tracking form: 2-sided
- Calculator

Background Discussion:

We're so lucky to live in a water-rich area with some of the best drinking water in the world. Lake Michigan provides many towns and communities on its coast, including Milwaukee, with an abundance of freshwater.

Water is Limited! Did you know that less than 3% of all the water on earth is freshwater? Over 97% is saltwater. Most of that freshwater is caught up as ice in glaciers, leaving us with less than 1% of all the water on Earth that is available for everyone – yes, all 7 billion of us -- to drink, use to shower or clean or for manufacturing. Just because we're lucky to have so much freshwater from Lake Michigan and area rivers doesn't mean we're not immune to water issues that may cause us to conserve water in the future. We shouldn't take our abundance of water for granted. Most of the world is experiencing a water crisis with freshwater disappearing or becoming extensively polluted or too many people living where there's too little water. Here are a few examples why we should all learn how to conserve water:

1. **Waukesha and New Berlin** - Only 20 minutes away from Milwaukee, the groundwater that these communities use for drinking water is polluted.

2. **U.S. Rivers** - Another example is the Colorado and Rio Grande rivers located out west. They are drying out in areas along their route a few times a year and they no longer flow to their end. (If students see the Freshwater Tool Kit's, Freshwater 101 presentation they will

learn the status of local and world water resources.)

3. **Aral Sea** – A freshwater lake larger than Lake Michigan, the Aral Sea in Central Asia, disappeared in less than 30 years from mismanagement, and the lake bed has turned to a desert. Millions of people had to move out of the area.

4. **Cities Running-out of Water** – There are over a dozen major cities worldwide that are facing a water crisis. They are either experiencing a drought, live on salt water or near polluted rivers or just have too many people living in a place that does not have enough water for everyone. Cape Town, South Africa was almost the 1st city in the world to run out of water in 2018, but luckily it rained and ended a several year drought. Today residents are forced to live on 13 gallons of water a day! We use about 70 to 100 gallons a day.

Save Energy! Did you know that saving water saves energy? And saving energy reduces greenhouse gases in the atmosphere which reduces the effects of climate change? It takes a lot of energy to pull water from its source, treat the water to make it safe to drink and pump it to our homes. It takes even more energy to create hot water. So, saving water is also saving electricity and saving you money on electric and water bills!

Did you know that letting your faucet run warm water for five minutes uses about as much energy as leaving a 60-watt light bulb on for 14 hours? Yikes! Don't let that water run.

Make a Difference! All of us together can make a significant impact on conserving water by checking out how we use water every day and then making a few easy adjustments to reduce water use and waste. Take a look at easy water conservation tips in the *Simple Solutions Guide for Great Lakes Health*. If we each do even a few of these suggestions, together, we would be saving millions of gallons a year!



Teacher Demo: In this activity, we're going to look at the amount of water we use in our homes in gallons. So how much is a gallon? [Show students a gallon container filled with water]. Here is a 1 cup measurement which equals 8 ounces. How many cups are in a gallon? [16 cups or 128 ounces]. A gallon of water weighs over 8 pounds plus the weight of the container. [Have

the students feel the weight of the gallon]. Can you imagine carrying a few gallons or more for 4 miles every day? Thousands of people, mostly women and girls, do this every day in countries like Africa and Asia. They don't have running water in their homes and have easy access to fresh clean water like we do.

Let's see how much water you use in a day and find tips to reduce that amount. Who knows, this information may be useful someday if you move and don't live in a water-rich city.

Activities:

Basic Activity: Grade 3-4: Review the Water Track Table with students on the amount of water used for each daily activity and the information and tips on page 2. Give each student a copy of the 2-sided table and the Simple Solutions Guide to Great Lakes Health to take home for their parents to complete for them.

Intermediate Activity: Grade 5-8:

Students will track the amount of water they use on a weekend day using the Water Track table. They can find ways to use less water on the back of the table. Students can compare the results with other students. Instructions:

- On a weekend, chart the amount of water you use from the time you get up to the time you go to bed. Use the Water Track chart that has totals for different activities.

- Ask an adult in your household whether you have standard or low-flow showerheads and toilets and if you have newer or older dish washers and washing machines. If you are not sure, assume a standard flow.
- Enter your name on the chart and number of people in your household.
- Count the number of times you do each water using activity in one day and write that number in the box for that day. Using tally marks is the best way to keep track, i.e. IIII = 4.
- For activities that other members in your family might do for everyone, such as cooking a meal, doing dishes or laundry, etc., count the number of times anyone in your family does those activities during the day and enter the tally in your chart. To find your portion of the water usage, multiply how many times you did that activity by the gallons used and then divide the total gallons for that activity by the number of people in the household. For example, if there are 4 people in your house and someone uses an older model washing machine to wash 2 loads of clothes the total gallons you use would equal:
 $2 \text{ loads} \times 40 \text{ gallons each} = 80 \text{ gallons}$
 $80 \text{ gallons} / 4 \text{ people} = 20 \text{ gallons.}$
- Keep tallying the water activities you do until you go to bed. Only document water used at home.
- **TOTALS:** Calculate the gallons used for each activity and then find the total gallons of water used. Take your table back to school to compare with other students.

Advanced Activities:

You can do just one or more of the activities below.

1. **1. Weekly Usage:** Have students track the daily use of water over a week's period and have them calculate their average daily use. Each student should report their average and add all averages to find an average daily total of the classroom.
2. **2. Water Needs:** Have students determine the total amount of water your class needs for a year based on the average found in #1 above. Find the population of your town and have students calculate what the entire community needs per day and per year.
3. **3. Water Cuts:** After students calculate out how much water they use in #1 above, they can imagine they live in Cape Town, South Africa and need to cut their water usage down to 13 gallons per day. Have them come up with a dozen ways they can reduce

water use and re-use water they let run. They can create their own practices, or they can research what they have been doing in Cape Town for creative ways to save water. You can also discuss ways to get more water other than the water we get from Lake Michigan, such as accessing groundwater, creating a dam in a local river, using rain barrels or cisterns, or using grey water systems.

References:

Water use amounts: A Student's Guide to Global Climate Change – US EPA

Tracking Chart: adapted from the University of Colorado's STEM Curricula on Dams

Resource: Water Resource Calculators:

<https://www.watercalculator.org/wfc/2/q/household/>