Title: When Are We Wasting Water? Written by GEF Staff
Grades: 3-5
Subjects: Science, Social Studies, Math, Health
Time: 1 hour

Brought to you by American Standard
Style That Works Better

Standards:
Science Standard 12: Understand the nature of scientific inquiry.

- Benchmark # 3: Plan and conduct simple investigations.
- Benchmark # 4: Use appropriate tools and simple equipment (e.g., measuring cups) to gather scientific data and extend the senses.

Mathematics Standard 4: Understand and apply the basic and advanced properties of the concepts of measurement.

- Benchmark # 1: Understand the basic measures of perimeter, area, volume, capacity, mass, angle and circumference.
- Benchmark # 3: Knows the approximate size of basic standard units (e.g., cups, pints, quarts, gallons) and the relationships between them (e.g., how many cups in a pint). Geography Standard 14: Understand how human actions modify the physical environment. Benchmark # 2: Know the ways in which the physical environment is stressed by human activity (e.g., water pollution, excessive water usage).

Geography Standard 15: Understand how physical systems affect human systems.

- Benchmark # 3: Know ways in which human activities are constrained by the physical environment (e.g., availability of water or lack thereof).

Geography Standard 18: Understand global development and environmental issues

- Benchmark # 2: Know ways in which resources can be managed and why it is important to do so (e.g., water conservation measures).
- Benchmark # 4: Know how human-induced changes that are taking place in different regions and the possible future impacts of these changes (e.g., in some areas water is plentiful whereas in other locations there is very little).

Health Standard 8: Know essential concepts about the prevention and control of disease.

- Benchmark # 1: Know ways in which a person can prevent or reduce the risk of disease and disability (e.g., practicing good personal hygiene).

Objectives: Students will be able to…

- Identify and describe how an individual's action in regards to water conservation can affect change and improve the environment.
- Identify the units used to measure capacity (cup, pint, quart, gallon) and convert from one unit to another within one system of measure.
- Demonstrate healthy behaviors (proper hand-washing techniques) that prevent disease and promote wellness. To view this creative lesson's artwork, please click here to view the downloadable PDF.

Materials:

- "Proper Hand Washing Techniques" handout provided below
- "Wasting Water" worksheet provided below
- Large pails
- Liquid hand soap
- Measuring cups
- Clean hand towels, one per student
- Watches with second hand

153 Washington Street | Fourth Floor | Walpole | MA | 02032 | 1.888.668.2298

- Pencils

Overview: Water is essential to life. The survival of every living organism on Earth depends on it. It is our most important natural resource. We use water every day, in our homes, schools, business, and recreation activities. We use it to drink, to cook, to wash, to flush, to play, and to garden, and in doing so we waste much of it. Therefore, water conservation, using water wisely and in an efficient manner, is vital in ensure its continued availability for everyone.

Water conservation is an environmentally sound and constructive approach to the water use issue. It is cost effective and allows us to stretch our existing water supplies. It requires much less of our sewage treatment plants, and saves energy in innumerable ways. It provides everyone, regardless of age or any other contributing factors, an opportunity to be socially responsible and take an active role in reducing our demand for water. Mostly it requires effort on our part.

The expectation of water efficiency and conservation programs is that we accomplish tasks with minimal amounts of water. Therefore, it is important that we recognize the difference between the amount of water required to effectively complete a task and the amount typically used. That difference is the amount of water that can potentially be conserved. The purpose of this lesson is to raise the level of awareness for students regarding their water usage and how they can conserve water in their everyday lives and truly help to make a difference.

Kid's Speak: Everyone everywhere needs water. We can't live without it. We use it to drink, to cook, to wash, and to play. We use it at home, at school, and at work, and when we use it we waste a lot of it. So we need to learn to conserve water, to make better use of it so we will have what we need in the future. Water conservation helps us make the best use of the water we have available and it is something everyone can do easily enough. It just takes some effort. We have to understand how much water we need to do a task, like washing our hands or brushing our teeth. Then we have to be aware of our actions while we are accomplishing that task. Are we leaving the water running? Are we running the water too fast? Are we using hot water when we only need cold water? Finding the answers to these questions, being aware of our actions and making the necessary changes so we stop wasting water, means we are making a true and worthwhile contribution to saving the environment.

Eco-Fact: Turning the water off while brushing your teeth saves approximately 3 gallons of water a day. Procedures: Note: This experiment requires the use of a sink deep enough to hold a large pail and sufficient clearance so students are able to wash their hands over the bucket and under the faucet simultaneously.

Before Conducting the Lesson:

- Brainstorm a list of ways we use water. Make a water web.
- Pose the questions: What would we do if we no longer had enough water? What are some of the actions we would take so we wouldn't waste the water we had? Record student responses.
- Introduce the term- water conservation.
- Explain to the students they are going to conduct an experiment on water conservation using hand washing as the task. Explain why it is important to wash your hands using proper hand-washing techniques, (According to the Center for Disease Control, hand washing "is one of the most important ways to prevent the spread of infection and illness.") and how frequently they should wash their hands (Hands should be washed before touching food, after touching raw food, after using the restroom, after blowing your nose, before and after touching wounds, after touching anything that might contain bacteria, and whenever your hands appear to be soiled.).

When Are We Wasting Water? Experiment:

1. Break the class into groups of two. During the first phase of the experiment one student will be the hand washer and the other the timekeeper/hand wash monitor. For phase two the students will reverse roles. The time it will take to conduct this experiment will depend on how many sinks

153 Washington Street | Fourth Floor | Walpole | MA | 02032 | 1.888.668.2298

and other materials are available. The time listed above plans for all students to be conducting the experiment simultaneously.

2. Distribute the Hand Washing Technique handout. Review the procedure carefully with the students. Explain that it is not only important to follow the procedure for health reasons, but for purposes of comparing the results of the experiment, it is very important that the time allotments be carefully observed.
3. Groups will take turns conducting the hand-washing phases of the experiment. Students will place the pail into the sink directly under the faucet. The water will be collected in the bucket while the students are washing hands. Students must follow the techniques as outlined on the handout. While one students washes the other monitors the process and informs the washer when to change from one step to the next.
4. During the first phase the water will run the entire time the student is washing hands. At the end of phase one the students will bail out the pail using the measuring cup. They will record the number of cups of water that filled the pail. During phase two of the experiment they will switch roles, however during this phase the water will be turned off during the 20 second washing time. After completing the washing process they will again bail the pail and record the number of cups of water. 5. After completing the hand washing experiment, each group will use the data collected to complete the "Wasting Water?" worksheet provided below.

After Conducting the Lesson:

- Groups will report their findings to the class. Record the information on a chart.
- Find the average number of gallons for each phase and the average number of gallons of water that can be conserved if the whole class turns off the water for those 20 seconds when they are washing their hands. Then talk about how many times a day they wash their hands and find how many gallons they would save a day. Do the same for a week's time and a month's time. Discuss the impact this one act would make to water conservation.

Adaptations:

- Do the worksheet as a group either as a review or to teach measurement conversions using Standard English measurement.
- Have an extra adult on hand to supervise the hand washing experiment if students need to leave the classroom to conduct this step.

Extensions:

- Ask students to consider: How much water might be conserved if they were to turn the water off when they brushed their teeth each day? (See Eco-Fact.) How much water might be conserved if they reduced the time in the shower by one to two minutes? (Studies indicate that a one or two minute reduction in shower time can save up to 700 gallons per month.)
- Do a follow up to the Wasting Water? worksheet converting the measurements into metric.
- Discuss the pros and cons of the hand washing techniques presented in this lesson. Is it more important to do a better job of hand washing for health reasons or should we just do a quick wash to conserve water?

153 Washington Street | Fourth Floor | Walpole | MA | 02032 | 1.888.668.2298