

# DRAFT

**9/14/07**  
**Tooth Booth**

### **Activity Description**

This activity teaches the importance of water conservation and shows how much water can be saved by simply turning off the water while brushing your teeth.

### **Take Home Message**

It is important to conserve water – one way you can do this is by turning off the water when you brush your teeth.

### **Massachusetts Frameworks**

Earth and Space Science  
The Water Cycle #10

### **Supplies**

- Two toothbrushes
- Two coolers with the spouts
- Two plastic measuring containers
- Fake teeth for brushing- reuse the same pairs ..its ok if they are dingy
- Dry erase board and marker
- Calculator
- Baking soda
- Washable markers for staining the teeth (blueberry pie)
- Stopwatch
- Prize – Dracula Teeth

### **Set-Up**

Set up a tarp under the table as well as over the table. This activity gets very messy. Pull out the 2 coolers with spouts. Fill each cooler about 3/4 of the way with water. Remember to pull up on the vent tab when you put the cover on, otherwise no water will run out of the spout. Set up the coolers next to each other in the middle of the table. Allow some space between them just so that the students don't bump into each other.

Next put some baking soda into two clear plastic cups and put each cup, a set of teeth, a toothbrush, and a cup of clean water next to each cooler. The teeth can be reused for an extended period of time. Next pull everything out the Rubbermaid container. Place the container on the floor under the spouts of the coolers. Place the 2 plastic measuring containers under the coolers in the Rubbermaid bin, one under each cooler. These containers are used by the students to catch the water from "brushing" their teeth.

Once you start the activity, two students will have tooth brushes and two students will have the containers to catch the water. You should prepare the teeth by drawing on a few lines of purple. The stopwatch or timer is used to time the 30 seconds they simulate brushing for. The calculator and marker board are used for doing the math to show how a little water wasted every day adds up to a very large amount over time.

One student will brush (dip brush in water, then baking soda) while the other runs the water catching it in the container. The student should rinse the brush in the small cup if they need to, not the running water.



## SET UP FOR THE MARKER BOARD

Water Used	Water Wasters	Water Savers
X 2 (Brush teeth twice a day)		
X 7 ( 7 days a week)		
X 52 (52 weeks a year)		
X 300,000,000 (people in the US)		
If every person in the country turned off the water when they brushed their teeth than we could save xxxxxxxx gallons		

## Background Science and Vocabulary

### Water Conservation

The earth is covered with water (75%), yet only one percent is available for drinking. Of the 75%, 97% of this is ocean, and only 3% is freshwater. BUT of that 3% 75% of it is frozen in the polar ice cap! If all of the worlds water could fit into a one gallon jug, only 1 Tablespoon would be freshwater available for us to drink.

Unfortunately, many of us take this small percentage of available water for granted. The average adult needs only 2 1/2 quarts of water per day to maintain health, but in the United states we each use 55 gallons of water per day for cooking, washing , flushing, and watering. That's alot more than we need to accomplish these tasks. In medieval times, a person used only a few gallons of water a day to meet their needs. Our wasteful habits not only deplete clean water reserves faster than we can replenish them, but they pollute many waterways, rendering them unfit for human consumption. They also stress aging drinking water and sewage treatment facilities beyond their capacities. In each of the past few years, wastewater treatment systems dumped an estimated 2.3 trillion gallons of inadequately treated sewage into the U.S. coastal waters, destroying beaches, fisheries, and other marine life.

On Cape Cod homes that are relying on septic systems need to be careful with water use to prolong the life of the septic system. Using a very large quantity of water can cause solids to flow out of the septic tank and into the leachfield potential clogging it and causing a backup of sewage.

We waste water both by practicing bad habits, like leaking the water running when we brush our teeth, and by using antequate equipment not built with water conservation in mind. Bad habits can be difficult to change, but new ones can save thousands of gallons of water per year per person. Installing new water-saving equipment and small devices also can save significant amounts of water per household without requiring us to change our daily routines. Many devices are inexpensive, available in local hardware stores, and easy to install. They can save energy ( and energy bills) too! By following a few simple steps, a typical family of four can save an astounding 50,000 to 100,000 gallons of water per year.

Here are some tips:

Repair leaky faucets

Install faucet aerators

Soak dirty dishes in a basin of soapy water first, then quickly brush and rinse

Run full loads in both the dishwasher and the clothes washer

Buy a front loading washer

Take shorter showers and always use your towel more than once

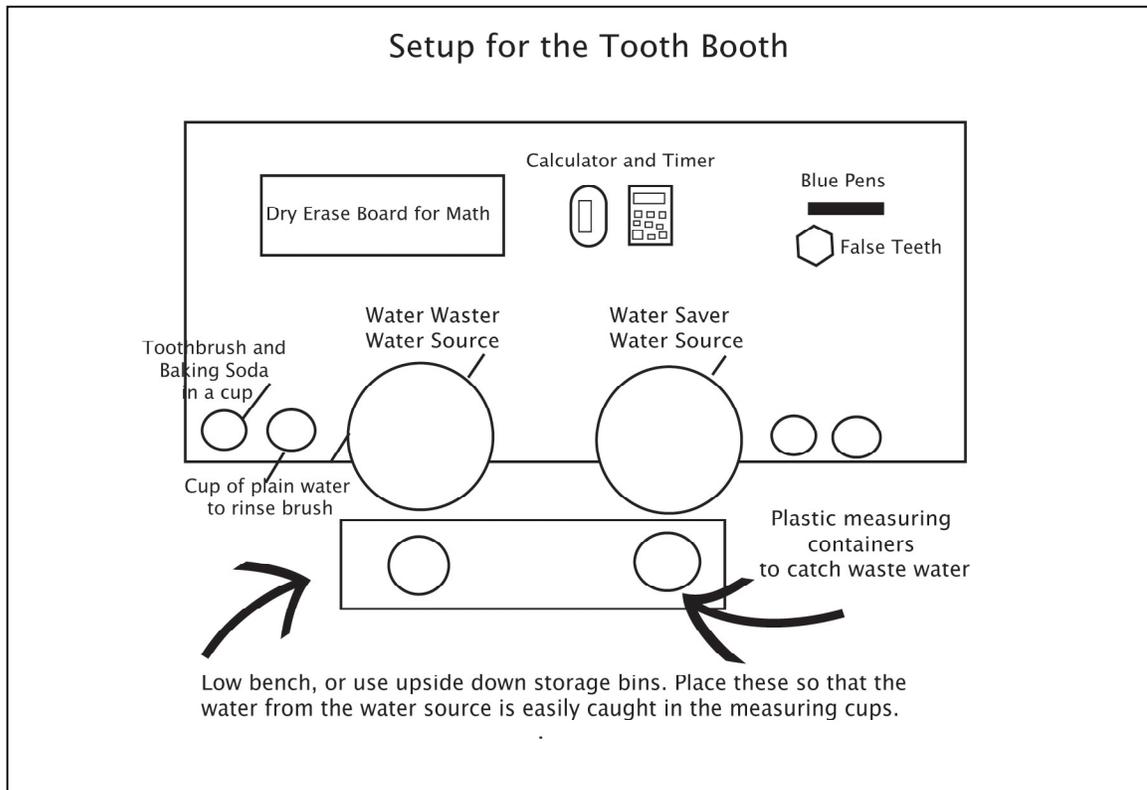
Turn of the tap when you brush your teeth or shave

Water the lawn or garden in the morning, and only when it needs it

Collect rainwater in a rain barrel to water plants

Use a nozzle on hoses with an automatic shutoff

When washing a car, shut off the hose in between rinses, and wash the car on the lawn so the plants can benefit twice, from the water, and the phosphorous in the soap



### Activity Procedure/Script

- **Tell the students they are going to learn about water conservation. Ask them if they know what conservation means, and why it is important to conserve water.**
  - Conservation is preserving a resource, like water, for future generations.
- **Ask the students what they do in the morning when they get up.**
  - Go to the bathroom, wash face, take shower, brush teeth
- **Ask them what else do we need water for besides brushing out teeth? How much water do you think we use in a day?**
  - An average household uses 55 gallons of water for each person per day
- **Ask the kids if they keep the water on while brushing their teeth.** Discuss with kids about water conservation and what they can do to help conserve water.
  - Now have them break into two teams
    - Explain that one team will be the **water savers** and one team will be the **water wasters**. If you have 5 in a group, you can have the fifth one be the data recorder and do the math on the board.
    - Explain that they've just finished a large delicious piece of blueberry pie, and their teeth got all purple...so they need some serious brushing!
    - **SHOW THEM THE TECHNIQUE FOR BRUSHING, RINSING IN A CUP SO THE LARGE RESERVOIRS CAN STAY CLEAN**
    - The **water saver** lets out a small burst of water each time their partner need to rinse off the brush (rinse the brush in the small cup )
    - The **water waster** keeps the water going the whole time.
  - Time the brushing for 30 seconds, measure how much water is used each time
- After running the activity, **ask the kids if they were surprised by how much water the team that ran the water constantly wasted.**
  - Now multiply both amounts of water by 2
    - Explain to the kids that you brush your teeth twice a day
  - Now multiply both amounts by 7
    - Explain that you brush your teeth 7 days a week.

- Stop and see if any of them are shocked yet.
  - You can keep going up to a year if you think they are doubtful or just to make a point.
    - Remind them how much water you can save!
  - *If you need something to compare it too, every time they wasted 2000 mL, that is the equivalent to a 2-L soda bottle filled with water!*
- **Ask how many are going to run the water when they brush their teeth now?**
- **You can ask them these other fun trivia information to help drive home the point.**
  - Remember how much water they use in a day? (55 gallons/person/day)
  - How much water did was used in day in medieval times? (5 gallons/person/day)
  - Remind students about the water cycle and that water is used and reused. The water that they are brushing their teeth with may be water that a dinosaur drank millions of years ago. There is only a finite amount of fresh water that is available on the earth's surface at a given time, and we need to use it wisely.
  - What are other ways then can think to conserve water?
    - Taking shorter showers
    - Washing the car on the lawn
    - Only running the dishwasher when it is full
    - Running the clothes washer when it is full, or changing the load size dial
    - Using your towels more than one time, hang to dry in between showers
- Give the students a new pair of teeth as a prize, but tell them not to open the teeth until later, as they will be asked to put them away (they are distracting- kids drool and slobber with them, having kids playing with their mouths is also not very hygenic)

## Clean-Up

### *During the festival*

- After each group, dump the water from the “waste” containers back into the coolers. Empty out the small cups of rinse water and refill with clean water
- Wipe off as much blue marker from the teeth and erase the marker board.
- Try to clean up as much excess water as possible after each group, it will just make life easier when cleaning up at the end of the day, be on the lookout for wet flooring and mop if needed.
- Refill the baking soda if necessary.

### *After the festival*

- Dump all the water out and thoroughly clean and dry all the containers and coolers.
- You may want to scrub the teeth with some comet if you can get it in the kitchen
- Dry the Rubbermaid container and put everything back into it.
- Dump the water off the tarps, dry as best as you can, fold and put away.
- If the floor is wet, make sure to mop it up to prevent accidents.
- Pack up everything and bring it to the car.

