

**HELPING KIDS
HELP FIGHT
OUR COMMUNITY
WATER SHORTAGE**

**BACKGROUND INFORMATION AND IN CLASS ACTIVITIES
FOR THE TEACHER AND STUDENT
ON WATER SAVING MEASURES FOR THE HOME**

WATER CONSERVATION IN OUR HOMES

Concepts

1. There are many ways to reduce the amount of water used in a home.
2. About 75% of the water used in homes is used in the bathroom.
3. About 45% of the water used in homes is used for flushing toilets.
4. Leaking or improperly functioning toilets can waste large amounts of clean water.
5. Leaking toilets can be identified by using food coloring or dye capsules and by making keen observations.
6. Most leaking or malfunctioning toilets may be corrected by one or more simple repairs.
7. Toilet tanks can be modified to help reduce the amount of water used to flush.
8. Toilet devices are available commercially which may help to reduce the amount of water used to flush away wastes.
9. Taking shorter showers and using less water in the bathtub will reduce the amount of water used.
10. The installation of devices such as aerators, restrictors, and cut-off valves can cut water use significantly.
11. Turning off the flow of water while soaping up and shampooing your hair in the shower, brushing your teeth, and shaving can save large amounts of water.
12. When shaving and handwashing, the sink stopper should be used to pond the water.
13. A faucet allows up to 5 gallons of water a minute to flow down the drain.
14. Washing machines and dishwashers should not be operated until full loads need washing unless water level adjustments for partial loads can be made.
15. Letting water run continuously while washing dishes by hand, wastes water and should be avoided.
16. Leaking faucets waste hundreds of gallons of water and should be stopped or repaired.
17. Effective but more efficient ways to water lawns, shrubs, and gardens should be investigated to reduce the amount of water used and to reduce evaporation.
18. The amount of water used in the home can be measured using a water meter.
19. There are two basic kinds of water meters: the single-dial meter and the six-dial meter.
20. Water meters measure water in gallons or in cubic feet.

Skill

Learn to read your water meter and use it to help detect leaks and conserve water.

Objectives

Upon completing this section, the student should

1. realize the many ways to reduce the amount of water used in the home,
2. know specific ways to monitor water use, check for defects in home water supply systems, and reduce water use around the home, and
3. accept responsibility for reducing the amount of water he or she uses.

Specifically, the student should be able to

1. identify ways to reduce the amount of water used in a home,
2. relate the approximate proportions of water used for various purposes in American homes,
3. identify the parts of a flush toilet and their use in the proper functioning of a toilet,
4. demonstrate the ability to check for a leaking or improperly functioning toilet,
5. identify ways of repairing leaking or improperly functioning toilets,
6. identify ways of reducing the amount of water required to operate a toilet,
7. list specific ways of reducing the amount of water used in taking baths and showers, shampooing hair, brushing teeth, washing hands, clothing, and dishes.
8. identify efficient ways to use water outside the home,
9. relate the approximate amount of water that can flow through a faucet or water hose in a given period of time,
10. accurately read and record the readings from a single-dial meter and a six-dial meter,
11. indicate how leaks in the home system can be detected using the water meter, and
12. determine the approximate amount of water used for different purposes in the home using a water meter.

Suggestions for Instructors

This section is designed to acquaint the student with water-use behaviors and measures that can reduce water consumption around the home. It is hoped that students will actually adopt some of the conservation behaviors and persuade other

family members to participate in making changes to help conserve water. The instructor needs to emphasize to students that they should not make alterations in home plumbing or water system devices on their own. Adjustments and changes in such devices should only be made with adult supervision or by an adult who has all the information needed. Otherwise, such changes could result in wasting more water or wasting more money.

A. Suggestions for Investigation 5 activities

This investigation should not cause problems for most students. They should consult with parents and let them know what they intend to do before removing the cover from their home toilet tanks and putting dye or coloring in the water. For students who live in homes with toilet tanks or toilet tank devices which are different from the one pictured, the instructor may wish to have them diagram the differences and try to explain how the devices work.

B. Investigation 6 activities

This investigation also involves simple activities which should not cause difficulty. For students who live in homes without a shower-tub combination, the instructor may wish to have students whose homes do have these to collect and share the data for question 6 of the investigation.

C. Investigation 7 activities

For this investigation students are involved in recording data and answering questions. Few problems should be encountered.

D. Investigation 8 activities

This investigation involves the students in getting some cooperation from others living in their homes, provided the home has a water meter. For part 2 of the investigation, students should be advised to collect the data when they are less likely to inconvenience other members of the household. The activity might be considered optional when it will cause problems.

Some utility departments discourage removal of water meter covers or lids. Since this is required to obtain the meter readings in the investigation, the instructor should check first with the local utilities. Many utility companies, on the other hand, may not only encourage such an activity, but may also provide a sample water meter for classroom demonstration. In any case, students should be told:

- a. not to remove the meter covers without parent or adult supervision and assistance,
- b. not to leave the meter covers off unattended and increase the risk of someone being injured,
- c. not to attempt to manipulate the meter in any way, and
- d. to replace the cover or lid as soon as they have finished their recordings.

Some home water meters may measure the water in cubic feet. If the need arises to convert cubic feet to gallons or to make comparisons, 1 cubic foot = 7.48 gallons.

E. Additional activities for students

1. By checking the water meter for a week (take a reading at the beginning and end of a week), have students determine the average amount of water used at their home in a day. Then through their own efforts and by sharing water saving information with others in their homes, see if this amount can be lowered. Check the average daily amount used at a later date for the same period of time and compare results. (See Investigation 3A.)
2. Why is a hot water leak considered to be more wasteful than a cold water leak?
3. Some utilities charge what is called a uniform rate for water used (for example, \$3.00 per 1000 gallons regardless of how much is used). Other utilities use a declining block rate system (the more water you use, the cheaper the same amount becomes--such as \$3.00 for each 1000 gallons under 10,000 used and \$2.00 for each 1000 gallons between 10,000 and 20,000 gallons used). Which system would be more effective in encouraging water conservation? Why do you think the other system is used in some cases? Can you think of a different pricing system that would encourage more water conservation? (In an increasing block rate system, the customer is charged a certain amount for an initial block of water, while the rate for succeeding blocks increases with each block.)

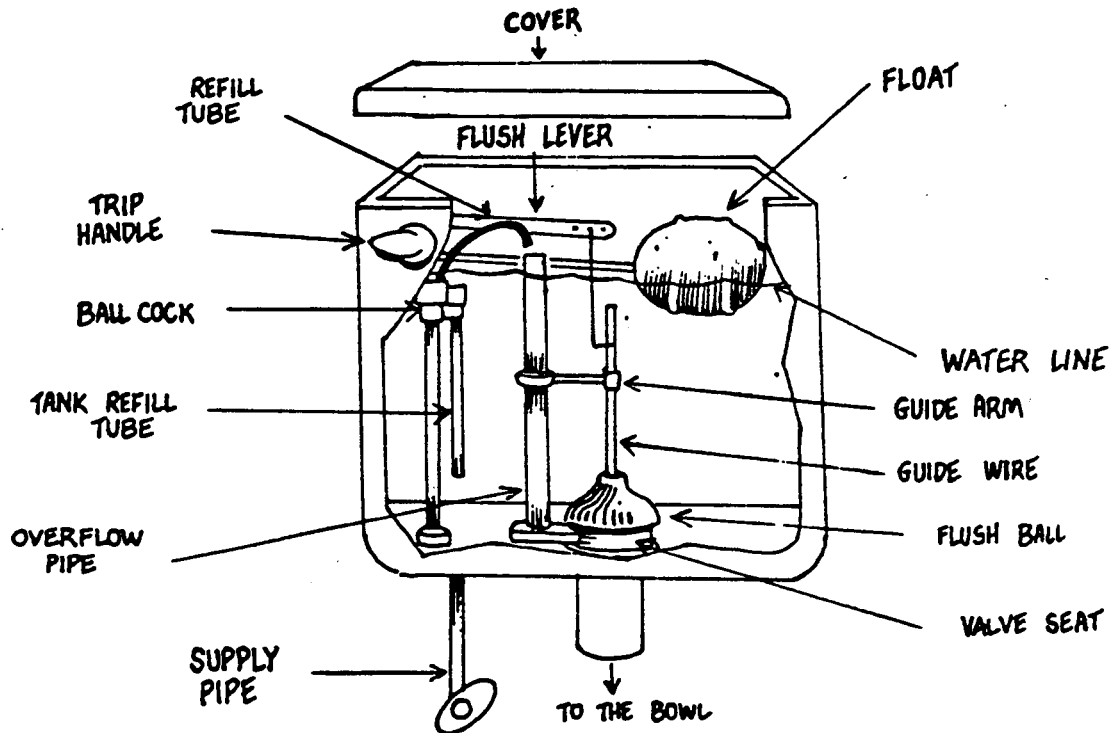
INVESTIGATION 5 TOILET TRAINING

Name _____

1. How many toilets do you have in your home? _____

2. With the lid off the toilet tank, observe how your toilet operates. Check the parts you find in the toilet tank. Remember, some tanks do not contain all of these parts.

a. ball cock assembly _____	f. flush ball _____
b. new design float assembly _____	g. float _____
c. refill tube _____	h. flapper and chain _____
d. valve seat _____	i. water-saving device _____
e. guide wire and arm _____	j. overflow pipe _____



3. Are there any water-saving devices in your toilet tank(s)?

_____ NO

_____ YES What kind of devices? brick _____ plastic jug _____
 toilet dam _____ weight on the guide arm _____
 something else _____

INVESTIGATION 5 TOILET TRAINING

4. Toilet Leak Checks

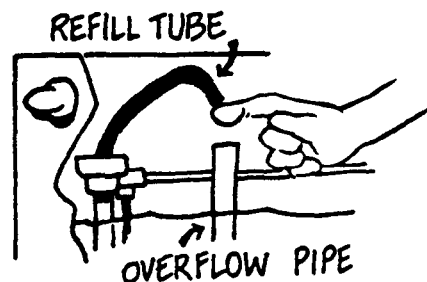
Check A

- (1) Make sure there are no wastes in the bowl.
- (2) Carefully remove the cover of the toilet tank.
- (3) Put some food coloring or special dye pills in the tank to color the water.
- (4) Do not flush the toilet for at least 15 minutes.
- (5) Then, without flushing, check to see if the color of the water in the bowl has changed. If so, you have a leak to stop.



Check B

- (1) Flush the toilet. To avoid wasting water, wait until there is some waste in the bowl.
- (2) Wait about 10 minutes.
- (3) Check to see if water is still flowing through the refill tube into the overflow pipe. If so, you have a leak to stop.



Results of the toilet checks:

In my home, the number of toilets that are leaking is _____. (If you answered 0, you are finished with this investigation).

If you found a leak, what do you think is causing the leak?

If you found a leak, is anyone in your family going to fix the leak(s) soon?

_____ YES _____ NO _____ DON'T KNOW

INVESTIGATION 6
MORE BATHROOM BASICS

Name _____



1. How many showers are in your home? _____
(If you don't have a shower, go to question 4)

2. If a shower is used, does it have a flow restrictor or water-saving shower head, or will your family be installing one soon?

___ YES ___ NO ___ DON'T KNOW



3. If you generally take a shower, how long do you let the water run?

Do you think you could take a shorter shower? ___ YES ___ NO

4. How many bathtubs are in your home? _____

5. If you generally take a bath, how deep do you usually fill the tub? _____

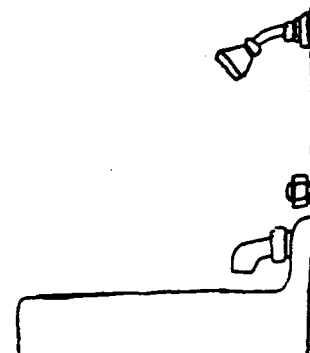
Do you think you could use less water in the tub? ___ YES ___ NO

Describe a way you could measure the amount of water, in gallons, that you use for your tub bath.

6. Do the shower-tub activity below, if possible.
If your home does not have a shower-tub combination in the bathroom, you will not be able to do this activity.

Shower-tub activity

- Put the stopper in the drain hole of the tub.
- Shower as usual.
- When you finish showering, check the level of the water in the tub.



Results of the activity

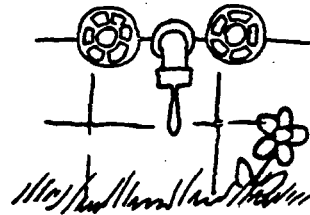
Do you use more water for a tub bath or a shower?

___ TUB BATH ___ SHOWER ___ ABOUT THE SAME

INVESTIGATION 7
ALL AROUND THE HOUSE

Name _____

1. How many inside and outside water faucets are at your home?



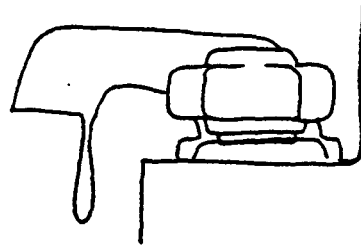
2. Are any of the faucets leaking?

_____ NO

_____ YES How many faucets are leaking? _____

How many of the leaks could be stopped by shutting off the faucets tightly?

3. If you discovered any leaking faucets inside or outside the house that could not be stopped by tightly shutting off the faucets, is anyone going to fix the leak(s) soon?



_____ YES _____ NO _____ DIDN'T HAVE ANY LEAKY FAUCETS

6. Is there an aerator on the kitchen faucet?

_____ YES _____ NO



7. Do you let the water run when you get a cold drink of water?

_____ YES _____ NO

8. If you wash dishes by hand, do you let the water run all the time?

_____ YES _____ NO

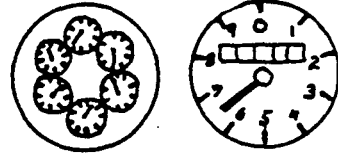
If your home has a dishwasher, do you wait for a full load before you use it?

_____ YES _____ NO

9. On the back of this worksheet, or on a separate sheet of paper, list at least five ways that you and your family regularly practice water conservation.

INVESTIGATION 8
MEET YOUR METER

Name _____



1. Where is the meter located?

2. Water Meter Leak Check

a. Turn off all the water faucets inside and outside of your house. Make sure no one flushes a toilet or operates a washing machine until you have completed this check. Do not turn off the main water valve.

b. Read the meter.

Date _____ Time of Day _____

Meter Reading _____

c. Wait at least 1/2 hour—longer if possible. Don't let anyone in your home use any water during this time.

d. Read the meter again.

Time of Day _____ Meter Reading _____

e. If the two meter readings are different, your home has a water leak. The leak may be inside your home or in a pipe underground between the meter and the house.

Result of the experiment:

Is there a leak in the water system of your home?

_____ YES _____ NO

Some meters have a little button that looks like this * or this ▲ that spins when water is being used. This button could help detect leaks.

f. If you discover your home has a water leak, it may be underground between the meter and the building. To detect this kind of leak, with an adult's assistance, first turn off the main water valve to your home. Then, if the meter dial still moves, the leak is probably between the meter and your home. Call your water department or a plumber for advice.

REPLACE THE COVER ON THE WATER METER AS SOON AS YOU COMPLETE THIS CHECK

INVESTIGATION 8
MEET YOUR METER

3. Does the meter for your home measure water in gallons or cubic feet?
____ GALLONS ____ CUBIC FEET
4. Does your home have a single-dial (speedometer-type) meter or a six-dial meter?
____ SINGLE-DIAL ____ SIX-DIAL
5. You can use the water meter to figure out how much water is used for different activities around the house.

Water Use Check

- a. Wait for a member of the family to use the shower.
- b. Watch the meter dial move for exactly one minute and record the amount of water used.
- c. Time how long the shower takes.
- d. Multiply the amount of water used in one minute by the number of minutes the shower takes.

$$\frac{\text{Amount of water used in 1 minute}}{\text{Number of minutes the shower takes}} \times \text{Number of minutes the shower takes} = \frac{\text{Total amount of water used during that shower}}{\text{gallons}}$$

- e. Do the same experiment for watering the lawn.
- f. How could you use the water meter to measure how much water is used to flush a toilet, wash a load of clothes, or take a bath?

Use this method to answer the following questions:

- (1) One toilet flush requires ____ gallons of water.
- (2) Washing one load of clothes requires ____ gallons of water.
- (3) Washing one load of dishes requires ____ gallons of water.
- (4) One average bath requires ____ gallons of water.

REPLACE THE COVER ON THE WATER METER AS SOON AS YOU COMPLETE THIS CHECK