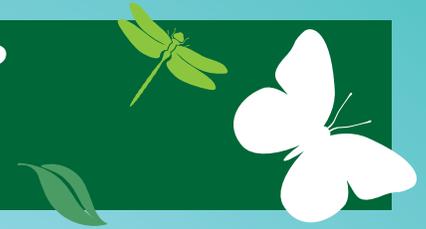


# How Do You Feel About Water?

Students conduct and analyze a survey about attitudes towards water and assess water knowledge



## Grade Level:

5-8, 3-4

## Subjects:

Science, math, social studies and language arts

## Learning Objectives:

Students will be able to:

- Design a survey questionnaire on the ways people use water
- Analyze survey data to determine heavy water use activities versus light water use activities
- Assess community members water knowledge

## Materials:

- Copies of the Water Conservation and Awareness Quiz
- Pens, paper, markers, etc. for designing the questionnaire

## Background

Besides the air we breathe, water is the most fundamental resource for human survival. Water is used in practically every human endeavor one can think of. Most people are unaware of how important water is and why it should be conserved. As populations increase so too does the demand for water. Water conservation therefore, has become an important consideration for countries, governments and cities. In many parts of the U.S., it is difficult to think of saving, water when it always seems to be available every time we turn on the tap. It often seems that the only time a person becomes aware of water is when it is no longer there. Educating people on how they can save water during their everyday activities is an important step in helping to conserve water. Surveying people on how they think about water, and the ways they use water, can be used in developing an educational strategy that targets those activities where people are more inclined to be wasteful.

## Preparation

Make enough photocopies of the Water Conservation and Awareness quiz for each of your students.

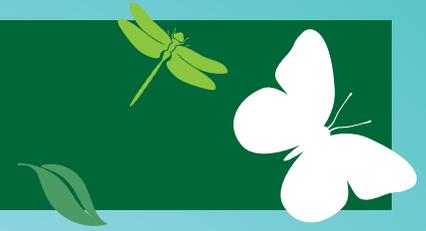
## Procedure

1. Ask students to list ways in which they use water in their homes. Write the list on the board. Then ask the students to list ways in which water is used outside the home, such as in farming and industry. Finally, ask the students if they can think of anything that people do that does not involve water in some way. It should be hard to think of an example! This preparatory step should help students realize the importance of conserving water and using it wisely.
2. Explain to students that they will ask members of their household and school to take the Water Conservation and Awareness quiz. Have students examine the quiz, take it themselves, go over the answers together, and then come up with some of their own questions to add to the quiz.

3. After they have prepared themselves and their own quiz, have students design a water use survey questionnaire that they will administer to the same members of their household and community. This information will be added to a spreadsheet. Using a spreadsheet, the ways in which water is used and the amount of water used per household can easily be compared to each household's water knowledge.



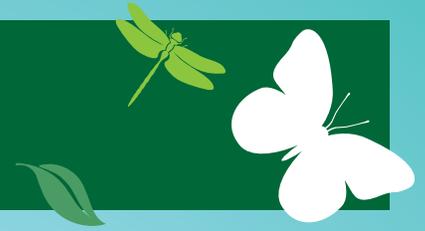
## **How Do You Feel About Water?** **(continued)**



- 4.** Facilitate a brainstorming session for the students to solicit questions for inclusion in their survey questionnaire. Possible questions for inclusion are:  
*Do you leave the water running when you brush your teeth? Do you run the dishwasher or washing machine when it is not full? Do you wash your car yourself or take it to the car wash? If you see a leaking faucet, do you turn it off or try to fix it immediately? Do you shower for more than 10 minutes per day? Do you water your lawn during the day, early morning, or at night? Do you let the water run to make it cold or to make it hot? Do you think the amount you pay for water is too low, too high, or just right? How many gallons per minute does your sink run (you can often read the nozzle)?*
- 5.** Have the students administer the quiz and questionnaire to members of their community and record the age, sex, educational level and occupation of the people they interview. They will then record their results on a spreadsheet or data table managed by the teacher and/or the students. In this way, the knowledge of households can be easily compared, along with differences in household demographics to be correlated against water knowledge. The exact number of people surveyed is not important, as long as it is more than 30 total and the total number is recorded. Students can look for differences in water use between males and females or younger and older individuals. This type of information can be used to better target an educational campaign to the correct audience. Ask students, What did they discover?
- 6.** Have the students create a list of all the household appliances that use water and to record this on the spreadsheet. If possible have the students ask for a current monthly water bill. Students can record the amount of water used per household on a monthly basis and the amount per month paid for water. The average water use per person (per capita) for each household can now be calculated.
- 7.** The students (or teacher, depending on level) should carefully manage the spreadsheet that contains the data gathered. An activity of this size can easily become unwieldy once one realizes the amount of information that can be gathered. The amount of data gathered need only be enough to gain insight into household water use and to be translated into an educational campaign for those surveyed.
- 8.** Once sufficient data has been collected, ask the students to examine it carefully and look for patterns they may notice and ideas they have for water conservation measures. Have the students research ways in which water can be conserved in the home such as: low-flow flush toilets and shower heads, watering the garden at night to prevent evaporation, washing the car with a bucket instead of a hose, operating the dish washer and washing machine only when they are full.
- 9.** Ask students to use their data to develop an educational campaign about local water use that could be implemented in their neighborhood. Present the data gathered using tables and graphs they design. These tables and graphs should clearly inform people about how they use water by breaking down their water use according to appliance and activity. Encourage students to be creative in their campaigns, creating slogans, logos, songs, posters, videos, booklets, flyers, and whatever else they can imagine.



## ***How Do You Feel About Water?*** ***(continued)***



### **Extensions**

- Have students conduct follow up studies on the surveyed households after they have been presented with the educational campaign, to see whether their water bill is lower or their water use is different after the educational campaign.
- Have students expand their survey area to the community as a whole.
- Have students survey school staff.
- Have students focus on other kinds of water conservation initiatives, besides what individuals can do in their own homes. Are there larger scale activities that could be targeted? Encourage students to think about state or national policies that affect water use, the ways their parents might pay for water, the systems by which water is delivered to homes and businesses, and industries that use large quantities of water. Are there water conservation strategies they can identify in any of these areas?

### **Modifications for Younger Students (Grades 3-4)**

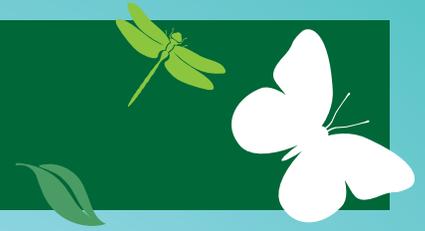
Instead of having students design the survey, provide the questions on the board, discuss each one and ask students if they have any questions they would like to add. Once the survey is complete, make copies of it and provide each student with several copies to take home. Tell them to ask a parent or older sibling to assist them in asking the questions of another person. They should try to administer no more than two surveys.

### **Assessment**

Use student charts, graphs, and project materials to assess their understanding of the data they gathered. As a class, develop a rubric (set of criteria and measures) for this evaluation prior to the project's start.



# Water Conservation and Awareness Quiz

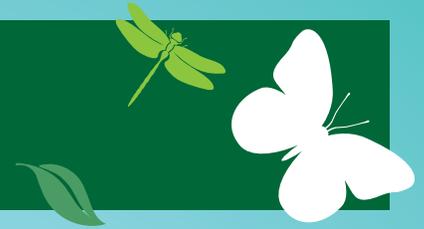


1. How much of the earth's water is usable for drinking and farming?
  - A. 10%
  - B. 50%
  - C. <1%
2. Where is most of the earth's fresh water located?
  - A. Reservoirs
  - B. Lakes/Rivers
  - C. Underground
3. How much water does a full-grown tree "give off" in 24 hours? (through the process called transpiration)
  - A. 10 Gallons
  - B. 40 Gallons
  - C. 70 Gallons
4. How much water falls altogether when one inch of rain falls on one acre of ground?
  - A. 27,000 Gallons
  - B. 17,000 Gallons
  - C. 7,000 Gallons
5. Who uses the most water?
  - A. Farmers
  - B. Industry
  - C. Power Plants
  - D. Individuals
6. What percentage of sewage is pure water?
  - A. 30%
  - B. 60%
  - C. 90%
7. How much water does the average toilet flush use?
  - A. 2 Gallons
  - B. 5 Gallons
  - C. 7 Gallons
  - D. 10 Gallons
8. True or False  
Dishwashers use twice as much water as washing dishes by hand.
9. True or False  
A 10 minute bath uses 40 gallons water; a 10 minute shower uses less.
10. How much water does a leaky faucet (slow drip) waste in a day?
  - A. 12 Gallons
  - B. 7 Gallons
  - C. 36 Gallons
  - D. 48 Gallons



# Water Conservation and Awareness Quiz Answer Key

(answers are in bold)



1. How much of the earth's water is usable for drinking and farming?  
**Less than 1%.** 97.5% of water on earth is salt water. The remaining 2.5% is fresh water, mostly frozen in glaciers and ice caps.
2. Where is most of the earth's fresh water located?  
A. Reservoirs  
B. Lakes/Rivers  
**C. Underground**
3. How much water does a full-grown tree "give off" in 24 hours? (through the process called transpiration)  
A. 10 Gallons  
B. 40 Gallons  
**C. 70 Gallons**
4. How much water falls altogether when one inch of rain falls on one acre of ground?  
**A. 27,000 Gallons**  
B. 17,000 Gallons  
C. 7,000 Gallons
5. Who uses the most water?  
**A. Farmers** - It takes 15,000 gallons to produce one bushel of wheat. It takes 6,000 gallons to produce 1 dozen eggs.  
B. Industry  
C. Power Plants  
D. Individuals
6. What percentage of sewage is pure water?  
A. 30%  
B. 60%  
**C. 90%** - or even 95% can be reclaimed.
7. How much water does the average toilet flush use?  
A. 2 Gallons  
**B. 5 Gallons**  
C. 7 Gallons  
D. 10 Gallons
8. True or **False**  
Dishwashers use twice as much water as washing dishes by hand. A modern dishwasher uses 15 gallons per wash, by hand -30 gallons.
9. True or **False**  
A 10 minute bath uses 40 gallons water, but a 10 minute shower will save you water. A shower uses 10 gal/min i.e.: a 100 gallons for a 10 minute shower, on average. Different kinds of shower heads will produce different results.
10. How much water does a leaky faucet (slow drip) waste in a day?  
A. 12 Gallons  
B. 7 Gallons  
**C. 36 Gallons**  
D. 48 Gallons

