

## LESSON 3: WATER CONSERVATION: *BECOMING WATER SMART*

### Lesson Overview

How many people does it take to make a difference? Just one. Students will analyze their daily water use and apply math skills to estimate the amount used per week and how much water they could conserve by becoming “water smart.”

### Arizona Department of Education Academic Standards

Please refer to the Arizona Department of Education Academic Standards section for the ADE standards addressed by this lesson.

### Learning Outcomes

Students will be able to:

- List ways they personally use water.
- Describe how water use habits affect the future availability of water.
- Use math skills to calculate total water use and estimate savings.
- List ways they can personally conserve water.
- Explain ways their families can conserve water.

### Materials

- transparency master: “Ways We Use Water and Water Smart Ways” (provided)
- overhead projector
- one gallon (3.79 l) empty container, for demonstration purposes
- “water smart survey” (provided)

### Advance Preparation

- Prepare the overhead projector and have ready the overhead transparency “Ways We Use Water and Water Smart Ways.”
- Photocopy “Water Smart Survey,” one per student

### Duration

Total: 60 minutes

Introduction and review of “Ways We Use Water” transparency: 40 min.

“Water Consultant” activity: 20 minutes

### Suggested Procedure

1) Review. Review with the students the past week’s study of water. Up to now, the water activities have focused on water supply and water cycle – where we get our water from and where it goes. In this activity, the class will take a closer look at how they personally use water and how their feelings and attitudes affect that use.

2) Water is a limited resource. Convey to the students that how we use water is influenced by how much water we think there is. Many people assume that there is an endless supply of water and so develop some pretty wasteful habits. But what if we understood that the supply of water is truly limited? The people who lived in Tucson long ago, the Hohokam, and the people that continue to inhabit the desert, the Tohono O’odham (whose name means Desert People) have long been aware of the scarcity of water here. Most plants and animals that live in the desert have adapted to their

arid environment by using less water. How can we adapt personally and as a class?

3) How we use water. Ask students to give examples of how they personally use water. List these examples on the board. Ask them if, when they use water in these ways, they ever consider how much water it really takes to do these things.

4) Ways we use water. Place the overhead transparency “Ways We Use Water and Water Smart Ways” on the overhead projector. Cover up everything except column 1 –“Activity.” It would be best to use two separate covers to be able to reveal each answer under column 2, “Typical Use” while keeping the other rows and column 3, “Water Smart” covered. Hold up the gallon (3.79 l) container to help students visualize a gallon. Ask the students how much water they think each of these activities takes. After a few guesses for each, reveal the answers under column 2, “Typical Use.” Then show the heading only of column 3, “Water Smart Way.” What do they think will be listed there? Review the entire table together.

5) Becoming water consultants. How many of these activities does each student do daily? How much water do they think they use on an average day? Explain that now their assignment is to become “Water Consultants” and interview a partner to find out how much water they use, and how much water they could save, on an average day.

6) Interview partners. Assign students to work in pairs and pass out the “Water Smart Survey” forms, one to a student. They will use these forms to interview their partner and calculate their partner’s water use based on the information in the overhead transparency. Their job as consultant is to add up how much water their partner uses and identify water use habits that can be changed to conserve water. In the “Water Smart Way” column, they should put how much water could be saved with a “water smart” activity.

7) How much can we save? Still in pairs, the students calculate how much water their partner could save using the information in the overhead transparency. They should then make recommendations to their partners, suggesting specific steps toward becoming “water smart.”

8) Closing discussion. Close the activity with a discussion of “water smart” water saving alternatives and students’ feelings about water. Encourage the students to consider what being “water smart” means. Use the following questions to guide the closing discussion:

Will the students’ increased wisdom about water affect their attitudes and habits about water?

How do they feel about the opportunities to save water suggested by their consultants?

How did it feel to be a consultant?

Refer back to Tucson’s Water Story Lesson One and the jar, which represented Tucson’s water supply. How could their consultant’s advice affect the water supply in that jar?

#### **EXTENSION:**

- As a class, calculate the total daily water use of the group. Then calculate the total possible water savings as a group, if everyone followed their consultant’s suggestions. Finally, multiply the findings by the number of students in the school to demonstrate the potential savings if each student learned to be “water smart.”
- Have students create surveys to conduct interviews at home to find out how their families use water. They may also serve as “water consultants” to their families.
- Conclude by emphasizing that to be truly water smart, we need to not only save water in the ways discussed today, but also be alert to even more ways to do our part.

# WAYS WE USE WATER AND WATER SMART WAYS

Overhead Transparency

<i>column 1</i>	<i>column 2</i>	<i>column 3</i>	<i>column 4</i>
<b>ACTIVITY</b>	<b>TYPICAL USE</b>	<b>WATER SMART WAY</b>	<b>AMOUNT WE COULD SAVE PER EVENT</b>
Brushing teeth	2 or more gallons (8 liters)  .25 gallon or less	(1 liter)  1.75 gallons (6.5 liters)	
Showering	50 gallons (189 liters)	12.5 gallons (47 liters)	37.5 gallons (142 liters)
Taking a bath	36 gallons (136 liters)	18 gallons (68 liters)	18 gallons (68 liters)
Washing hands	2 gallons (7.5 liters)	1 gallons (4 liters)	1 gallons (4 liters)
Flushing toilet	3.5 to 5 gallons (13 to 19 liters)	1.5 gallons (6 liters)	2 to 3.5 gallons (7 to 13 liters)
Washing dishes by hand	30 gallons (113.5 liters)	5 gallons (19 liters)	25 gallons (94.5 liters)
Washing dishes by machine	16 gallons (60.5 liters) 9 gallons	(34 liters) 7 gallons (26.5 liters)	
Washing clothes	35 gallons (132 liters) 25 gallons	(94.5 liters) 10 gallons (38 liters)	

# WAYS WE USE WATER AND WATER SMART WAYS

## Teacher Guide

<i>column 1</i>	<i>column 2</i>	<i>column 3</i>	<i>column 4</i>
<b>ACTIVITY</b>	<b>TYPICAL USE</b>	<b>WATER SMART WAY</b>	<b>AMOUNT WE COULD SAVE PER EVENT</b>
Brushing teeth	2 or more gallons (8 liters) tap running	.25 gallon or less (1 liter or less) tap off or with water smart cup	1.75 gallons (6.5 liters)
Showering 50 gal (189 l)	conventional showerhead: 5 gal (19 l) per minute for 10 minutes 12.5 gal (47 l) water saving	showerhead: 2.5 gal (9.5 l) per minute for 5 minutes 37.5 gal (142 l)	
Taking a bath	36 gal (136 l) full tub	18 gal (68 l) half-full tub	18 gal (68 l)
Washing hands	2 gal (7.5 l) water running 1 gal (4 l)	fill basin 1 gal (4 l)	
Flushing toilet	3.5 to 5 gal (13 to 19 l) per flush with conventional toilet	1.5 gal (6 l) per flush - low volume tank or 4 gal (14.5 l) per flush with tank displacement	2 to 3.5 gal (7 to 13 l) low volume tank
Washing dishes by hand	30 gal (113.5 l) tap running	5 gal (19 l) wash and rinse in filled basin	25 gal (94.5 l)
Washing dishes by machine	16 gal (60.5 l) per load - full cycle, partially loaded	9 gal (34 l) per load - short cycle, fully loaded	7 gal (26.5 l)
Washing clothes	35 gal (132 l) per load - highest level, partially loaded	25 gal (94.5 l) per load - adjust size to load	10 gal (38 l)

# WATER SMART SURVEY

Name of water user \_\_\_\_\_

Date \_\_\_\_\_

Name of water consultant \_\_\_\_\_

<i>column 1</i>	<i>column 2</i>	<i>column 3</i>	<i>column 4</i>	<i>column 5</i>
<b>ACTIVITY</b>	<b>AMOUNT USED (GALLONS OR LITERS)</b>	<b>TIMES PER DAY</b>	<b>TOTAL AMOUNT USED</b>	<b>WATER SMART WAY POSSIBLE SAVINGS</b>
<i>Brushing teeth</i> <input type="checkbox"/> tap on <input type="checkbox"/> tap off				
<i>Showering</i> <input type="checkbox"/> 10 minutes + <input type="checkbox"/> 5 minutes  <i>Bathing</i> <input type="checkbox"/> tub full <input type="checkbox"/> tub 1/2 full				
<i>Washing hands</i> <input type="checkbox"/> tap on <input type="checkbox"/> tap off				
<i>Flushing toilet</i> <input type="checkbox"/> conventional <input type="checkbox"/> water saving device				
<i>Washing dishes by hand</i> <input type="checkbox"/> running water <input type="checkbox"/> basin of water  <i>Washing dishes by machine</i> <input type="checkbox"/> partial load <input type="checkbox"/> full load				
<i>Washing clothes</i> <input type="checkbox"/> partial load <input type="checkbox"/> full load				
<b>TOTAL Water/Day</b>				

To be “water smart”, I recommend the changes in water use habits listed on the back of this page.

Signed \_\_\_\_\_