



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

- ◆ *Ways We Use Water and Water Smart Ways* master and key (provided)
- ◆ overhead projector or Smart Board
- ◆ one gallon (3.79 l) empty container, for demonstration purposes
- ◆ *Water Smart Survey* (provided)

Advance Preparation

- ◆ Prepare the overhead projector or Smart Board for use with *Ways We Use Water and Water Smart Ways*.
- ◆ Photocopy *Water Smart Survey*, one per student.

Duration

Total: 60 minutes

Introduction and *Ways We Use Water*: 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. Display *Ways We Use Water and Water Smart Ways* on an overhead projector or Smart Board.

- 💧 Cover the last two columns of the table (“Water Smart Way” and “Water Smart Savings”) to reveal only the first two columns (“Activity” and “Typical Use”).
- 💧 Hold up the gallon (3.791 l) container to help students visualize a gallon.
- 💧 Review each of the activities in the “Activity” column and ask students how much water they think each activity typically uses. Note that the “Typical Use” method in the second column (e.g., “water running”) is what most people do when using water for that activity. Discuss responses.
- 💧 Refer to the *Ways We Use Water and Water Smart Ways Teacher’s Guide* and enter the correct amount in the space provided beside “gallons.”
- 💧 Reveal the third column to show how much water is used the “Water Smart Way.” Ask students what might be a Water Smart way for each of the activities. Enter their responses in the space provided (refer to the *Teacher’s Guide* but note that these are not the only answers).
- 💧 Complete the fourth column by calculating the “Water Smart Savings” for each activity (the amount of water that can be saved “per event”, such as each time a student washes her hands, or brushes his teeth). (“Water Smart Savings” = “Typical Use” – “Water Smart Way”).

5) Become water consultants. Assign students to work in pairs and pass out the *Water Smart Survey* forms, one per student. They will use these forms to interview their partner and calculate their partner’s water use based on the information displayed in *Ways We Use Water and Water Smart Ways*. Their job as consultant is to determine:

- 💧 how their partner uses water for each “Activity”
- 💧 “Amount Used” for each activity
- 💧 how many “Times Per Day” for each activity
- 💧 “Total Amount Used” for each activity (= “Amount Used” X “Times Per Day”)

6) How much can we save? Still in pairs, the students identify water use habits that can be changed to conserve water and calculate how much water their partner could save using the “Water Smart Savings” data from *Ways We Use Water and Water Smart Ways* and their “Times Per Day” data from the *Water Smart Survey* form. Students should calculate:

- 💧 “Total Water Smart Savings” = “Water Smart Savings” X “Times Per Day”
- 💧 “TOTAL Water Used/Day” = total of each column

Consultants should then make recommendations to their partners, suggesting specific steps toward becoming Water Smart. Consultants should write these steps on the back of the *Water Smart Survey*.



7) 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?

EXTENSIONS:

- 💧 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

ACTIVITY	TYPICAL USE	WATER SMART WAY	WATER SMART SAVINGS
Brushing teeth Method Water used	water running _____ gallons	_____ 0.25 gallons	
Showering Method Water used	conventional showerhead _____ gallons	_____ 12.5 gallons	
Taking a bath Method Water used	full tub _____ gallons	_____ 18 gallons	
Washing hands Method Water used	water running _____ gallons	_____ 1 gallons	
Flushing toilet Method Water used	conventional toilet _____ gallons	_____ 1.5 gallons	
Washing dishes by hand Method Water used	water running _____ gallons	_____ 5 gallons	
Washing dishes by machine Method Water used	full cycle – partial load _____ gallons	_____ 9 gallons	
Washing clothes Method Water used	high setting - partial load _____ gallons	_____ 25 gallons	





ACTIVITY	TYPICAL USE	WATER SMART WAY	WATER SMART SAVINGS
Brushing teeth Method Water used	water running 2 or more gallons	turn water off or use a Water Smart cup 0.25 gallons	1.75 gallons
Showering Method Water used	conventional showerhead 5 gal./min. for 10 mins. 50 gallons	showerhead 2.5 gal./min. for 5 mins. 12.5 gallons	37.5 gallons
Taking a bath Method Water used	full tub 36 gallons	half-full tub 18 gallons	18 gallons
Washing hands Method Water used	water running 2 gallons	turn off water or use basin .5 gallon or less	1.5 gallons
Flushing toilet Method Water used	conventional toilet 3.5 to 5 gallons	low-flow toilet 1.5 gallons	2 to 3.5 gallons
Washing dishes by hand Method Water used	water running 30 gallons	water running 30 gallons	25 gallons
Washing dishes by machine Method Water used	full cycle – partial load 16 gallons	short cycle – full load 9 gallons	7 gallons
Washing clothes Method Water used	high setting - partial load 35 gallons	adjust setting to load 25 gallons	10 gallons





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>
ACTIVITY	AMOUNT USED (GALLONS OR LITERS)	TIMES PER DAY	TOTAL AMOUNT USED	WATER SMART WAY POSSIBLE SAVINGS
Brushing teeth <input type="checkbox"/> water running <input type="checkbox"/> water off or use a Water Smart cup				
Showering <input type="checkbox"/> 10 minutes + <input type="checkbox"/> 5 minutes Showering <input type="checkbox"/> tub full <input type="checkbox"/> tub 1/2 full				
Washing hands <input type="checkbox"/> water running <input type="checkbox"/> water off or use basin				
Flushing toilet <input type="checkbox"/> conventional <input type="checkbox"/> low-flow toilet				
Washing dishes by hand <input type="checkbox"/> water running <input type="checkbox"/> wash and rinse in filled basin 5 minutes Washing dishes by machine <input type="checkbox"/> tub full <input type="checkbox"/> tub 1/2 full				
Washing clothes <input type="checkbox"/> partial load <input type="checkbox"/> full load				
TOTAL Water Used/Day				

To be Water Smart, I recommend the changes in water use habits listed on the back of this page.

Signed _____