

A DAY IN THE LIFE OF A DROP

Worksheet #2



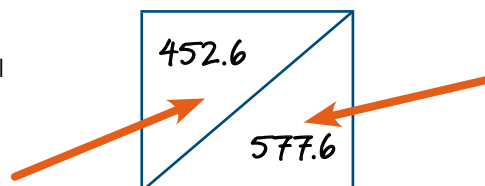
This exercise is designed to show how each member of your family uses water in the bathroom. The bathroom is a **small** room where many of us waste a **HUGE** amount of water! Using this worksheet, you will learn to calculate each family member's average daily water use (about how much they use each day) for the bathroom sink, the shower, the bathtub and the toilet. Follow the instructions below to calculate each person's average daily water use.

Preparation

1. Prepare one *Water Use Table* for each day of the week. You will need one sheet for each day (and one for each bathroom). Enter the day of the week at the top of the sheet where it says "Today is:" and fill in each person's name across the row called "Family Members." Post today's table in the bathroom with a pen or pencil and either a timer or clock. (Try to find a spot where the sheet will stay relatively dry, but remember that you should never put paper on hot things such as heaters, vents, radiators, curling irons, etc.) Once you get the OK from your parents about where you're going to keep the sheet, make sure everyone is aware of where the sheet is for each bathroom.
2. Ask each member of your family to record the *number of minutes* they use the faucet and the shower and the *number of times* they flush the toilet or take a bath. (Note that for the toilet and the bathtub, you are recording the actual number of times you flush the toilet or take a bath, *not* the number of minutes you are using them.)

IMPORTANT NOTE FOR ROW D: The cells in Row D are split so you can fill out information for more than one bathroom, if you need to. Study the diagram below so you'll know where to put your answers.

The top half will be the total # of gallons of water used by one person for the whole week for ONE bathroom.



The lower, right half will be for the total # of gallons of water used by that person for the whole week for ALL bathrooms.

Figure 1

If you only have one bathroom in your home, you can leave the lower, right half of the cells in Row D blank.



WATER USE TABLE

Today is:

Note: If you need more rows (more than 6 uses), add them to the back of this sheet, but don't forget to include them in your calculations!

Family Members →		Mom				Audrey				Dad			
Fixture →		Faucet	Shower	Bath	Toilet	Faucet	Shower	Bath	Toilet	Faucet	Shower	Bath	Toilet
		Number of minutes/uses per fixture											
USES	1 ST	1.5 min	12 min		1								
	2 ND	14 min			1								
	3 RD	4 min			1								
	4 TH				1								
	5 TH				1								
	6 TH												
A 1-4	Total # of minutes or uses person, per fixture, per day	19.5 min A1	12 min A2	0 uses A3	5 A4	19.5 min B1	12 min B2	0 uses B3	5 B4	19.5 min C1	12 min C2	0 uses C3	5 C4
B 1-4	Total # of gallons per person, per fixture, per day	42.9 gal B1	18 gal B2	0 gal B3	17.5 gal B4	42.9 gal C1	18 gal C2	0 gal C3	17.5 gal C4	42.9 gal D1	18 gal D2	0 gal D3	17.5 gal D4
C	Total # of gallons per person, per day	78.4											
D	Total # gallons per person, per week	452.6 gal/week											
E	Average # gallons per person, per day	577.6 gal/week											
		423 gal/week				581.7 gal/week				581.7 gal/week			
		500.5 gal/week				581.7 gal/week				581.7 gal/week			
		82.5 gal/day				71.5 gal/day				83.1 gal/day			

BONUS

Average # gallons per family, per day

553.3 gal/family/day

CALCULATIONS

A. TOTAL # OF MINUTES OR USES PER PERSON, PER FIXTURE, PER DAY

Find the total number of minutes or uses for each person for each fixture in the bathroom each day by completing the following steps:

For parts A1–4 below, record your final answers in each Water Use Table in the row called "Total # of minutes or uses per person, per fixture, per day" in the appropriate column for each fixture.

A1. Add up the number of minutes each person used the faucet each day.

A2. Add up the number of minutes each person used the shower each day.

A3. Add up the number of times each person took a bath each day.

A4. Add up the number of times each person flushed the toilet each day.

Example: Audrey adds up each of the numbers her mom recorded when she used the faucet on Monday. $1.5 + 14 + 4 = 19.5$ On the Water Use Table, Audrey records 19.5 in her mom's faucet column in the row called "Total # of minutes or uses per person, per fixture, per day."

B. TOTAL # GALLONS PER PERSON, PER FIXTURE, PER DAY

Find the total number of gallons of water each person used for each fixture in the bathroom each day by completing the following steps:

For parts B1–4, record your answers in the row of each Water Use Table called "Total # gallons per person, per fixture, per day" in the column for each fixture.

B1. Total Faucet Water Use

If you do not have a high-efficiency faucet, multiply each person's total number of minutes of use for the sink faucet (Answer to A1) by the number 2.2 (which equals the maximum number of gallons per minute for an average faucet).

If you have a high-efficiency or WaterSense®-labeled faucet, multiply each person's total number of minutes of use for the faucet (Answer to A1) by 1.5 (the maximum number of gallons per minute used by most high-efficiency faucets). This will give you the number of gallons each person uses the faucet per day.

Example: First Audrey finds out what kind of faucet she has. She asks her mom to help her and learns that she does not have a high-efficiency faucet, so she multiplies 19.5 (her answer to part A1, the number of minutes her mom used the faucet on Monday) by 2.2 to find that her mom used about 42.9 gallons of water from the faucet on Monday. She records her answer on the Water Use Table in the row called "Total # gallons per person, per fixture, per day."

If Audrey had a high-efficiency faucet, she would have multiplied by 1.5 to find that her mom would have used only 29.3 gallons of water from the faucet for Monday. Wow! What a difference! If she had a high-efficiency faucet, Audrey's mom could have saved more than 13½ gallons of water just from the faucet in one day!

B2. Total Shower Water Use

Next you'll need to make the same calculation for the showerhead. If you have a regular showerhead, multiply each person's total number of minutes of use for the shower (answer to A2) by the number 2.5 (average number of gallons per minute used by an average showerhead).

If you have a high-efficiency shower head, multiply each person's total number of minutes of use for the shower (answer to A2) by the number 1.5 (maximum number of gallons per minute used by most high-efficiency showerheads). This will give you the number of gallons each person uses the shower per day.

B3. Total Bath Water Use

To find the number of gallons used for baths per day, multiply your answer to A3 for each person (total number of baths per day) by 40, the average number of gallons of water used per bath. This will give you the number of gallons each person uses in bath water each day.

B4. Total Toilet Water Use

To find the number of gallons of water each person uses by flushing the toilet you'll first need to complete the following steps.

1. First, have your parents help you find out how old your toilet is. Most toilets will have a stamp in the porcelain that tells you what year it was made. If you can't find it, you'll have to estimate.
2. Next, multiply each person's total number of uses for the toilet for each day (your answers to A4 for each person) by the number of gallons of water for a toilet in the same age range as yours. Use this guide below to figure out what number to multiply by:
 - a. If your toilet was made before 1982, multiply your answer to A4 (number of times each person used the toilet each day) by 6.
 - b. If your toilet was made between 1983 and 1993, multiply the answer to A4 by 3.5.
 - c. If your toilet was built after 1994 (or you know that you have a high-efficiency model), multiply the answer to A4 by 1.6.
 - d. If you have a WaterSense-labeled toilet, multiply the answer to A4 by 1.28

These calculations will result in the total number of gallons used per person by flushing the toilet each day.

***Example:** First Audrey found out how old her toilet is. She and her mom looked to see if they could find a stamp with the date on it. There was one! It said 1987. After looking at the chart to see how many gallons of water a toilet made in 1987 uses per flush, Audrey knew that she needed to multiply her mom's number of uses for Monday (5) by 3.5. When she made this calculation, she found that her mom used 17.5 gallons of water from the toilet on Monday.*

By comparison, if Audrey's toilet was a WaterSense toilet, her mom would only have used 6.4 gallons of water! That's only about 1/3 of the water her older toilet uses!

C. TOTAL # GALLONS PER PERSON, PER DAY

Once you have all the daily totals for the gallons of water each family member has used from each fixture for the day, you'll need to add them up for each person to get their daily total.

For part C, record your answers in the row of each Water Use Table called "Total # gallons per person, per day."

***Example:** Audrey found that her mom used 42.9 gallons of water from the faucet, 18 gallons from the shower, 0 gallons from the bath and 17.5 gallons from the toilet. When she added them up, she found that her mom used 78.4 gallons of water on Monday.*

If Audrey had all high-efficiency fixtures in her home, her mom's total would have been 53.7, which is 24.7 gallons or about 1/3 less water every day!

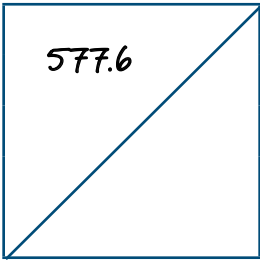
D. TOTAL # GALLONS PER PERSON, PER WEEK

At the end of the week, add up the number of gallons used by each person for each day. Record your answer for each person in the row called "Total # gallons per person, per day."

IMPORTANT: If you have more than one bathroom, remember to add the number of gallons for each bathroom first, and record that total on each sheet. Then add each bathroom together to get your total and record this answer in the lower half of the divided cells in Row D as seen in Figure 1.

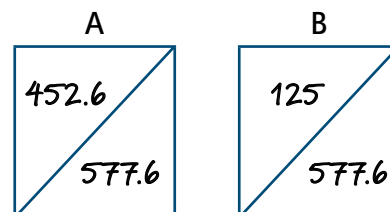
***Example 1:** After finishing her calculations for #4, Audrey found that her mom used:*

Monday:	78.4 gallons
Tuesday:	76.0 gallons
Wednesday:	82.2 gallons
Thursday:	76.0 gallons
Friday:	81.0 gallons
Saturday:	88.0 gallons
Sunday:	96.0 gallons
TOTAL:	577.6 gallons



Example 2: If Audrey had two bathrooms in her house, she would have two sets of answers. In that case, her calculations would look like this.

Bathroom 1		Bathroom 2	
Monday:	66.4 gallons	Monday:	12.0 gallons
Tuesday:	56.0 gallons	Tuesday:	20.0 gallons
Wednesday:	64.2 gallons	Wednesday:	18.0 gallons
Thursday:	61.0 gallons	Thursday:	15.0 gallons
Friday:	72.0 gallons	Friday:	9.0 gallons
Saturday:	67.0 gallons	Saturday:	21.0 gallons
Sunday:	66.0 gallons	Sunday:	30.0 gallons
TOTAL: 452.6 gallons		TOTAL: 125.0 gallons	



These two totals would go in the upper left corner of the sheets for each bathroom. Then Audrey would add them together to get the combined total of 577.6, which would go in the lower, right half of the answer square in the row called "Total # gallons per person, per week."

E. AVERAGE # GALLONS PER PERSON PER DAY

Divide the answer to part D (**Total gallons per person per week**) for each person by 7 (or, if you did not conduct the exercise for a full week, divide by the number of days you conducted the activity). This number is the average number of gallons each person uses per day. Record your answers in the row called "Average # gallons per person per day" in the table.

BONUS: Find out how much water your whole family uses every day! Add up the answers to part D (Total # gallons per person per day) for each family member and divide by the number of family members who participated. Audrey's family uses more than 550 gallons of water everyday... yikes! Looks like it's time for Audrey's family to start learning how to use water more efficiently!

We can all do a better job of using water efficiently.
Check out the *Pledge to Filter out Bad Water Habits* and learn how to start filtering out your bad water habits today!

To learn more about using water more efficiently, go to
EPA's WaterSense Web site where there is a section just for kids!
www.epa.gov/watersense/kids/index.htm