Home Water Investigation Instructions—Student Copy Page

Part I

1. Use the ***Bozeman Home Water Investigation Worksheet*** to keep track of your investigation.

2. In Column 1, predict the number of times you do each type of activity in one day.

3. In Column 2, record the actual number of times you complete each water use activity over one day. Make a note every time you flush the toilet, brush your teeth or get a drink of water. Write down how long you ran the water each time in Column 3. **Be sure to keep track of the family's dishes and laundry, too.**

4. After you have completed the 24 hours of recording, calculate your actual water use in gallons based on the notes you took and the flow rate of your appliances and fixtures in columns 4a and 4b. (Circle one—you may need to ask a parent or guardian about their age.) Determining the total for some uses may require calculation. For example, if you flushed the toilet four times, and you have a newer toilet, you first have to determine gallons per flush (1.6) and then multiply by the four times you flushed (4 x 1.6 = 6.4 gallons). If you have any trouble with your calculations, ask an adult for help.

5. After you have calculated the number of gallons for each usage, add them up to determine the total number of gallons used in a 24-hour period and record at the bottom of Column 5.

Part II

This part of the activity will be done in class.

Part III

1. In class you will have determined some actions you can take to potentially conserve water and recorded them in Column 6. Now you will try those actions and see if you really do use less water. Your actions may be behavioral (like taking shorter showers or turning off the water while brushing your teeth) or technological (like installing a new showerhead). Make any technological changes before you start your second water investigation. Make sure to try any behavioral water conservation actions at the time of use.

2. Choose a second 24-hour period to conduct your water investigation.

3. Record your use on the worksheet in columns 7 and 8, as you did before.

4. At the end of 24 hours, calculate your new actual water use in gallons and record in column 9. Depending on the water conservation methods you chose, you may have to carefully estimate (rather than calculate) how much water you saved (based on what you know). If you have difficulty, ask an adult for help.

5. If you saved water compared to your first investigation, determine how many gallons of water you saved for each use by subtracting the total gallons from the investigation using water conservation methods (Column 9) from the total gallons from the original investigation (Column 6) and record in Column 10. This will tell you how many gallons of water your conservation methods saved.

Home Water Investigation Worksheet—Student Copy Page (1 of 2)

Day 1

	Water Use	1. Predicted number of uses and amount of time	2. Actual number of water use	3. Time of actual water use	4. Number of gallons per use	5. Actual number of gallons used per day
Personal	**EXAMPLE—Brush teeth (bathroom faucet)**	**2 times, water running for 1 minute each time**	**2**	**1 minute each time, 2 minutes total**	**2.5 gallons per minute**	**5 gallons** (2 times x 2.5 gallons per time)
	Brush teeth (bathroom faucet)				2.5 gallons per minute	
	Toilet flush (toilet)				1.6 gallons per flush	
	Wash hands (bathroom faucet)				2.5 gallons per minute	
	Shower (showerhead)				2.5 gallons per minute	
	Get a drink of water (kitchen faucet)				2.5 gallons per minute	
Family	Use washing machine on largest load setting (washing machine)				25 gallons per load on large setting (15 gallones for efficient washers)	
	Water lawn with sprinkler (sprinkler)				3 gallons per minute (with nozzle)	
	Wash car, dog, driveway, bike, etc. with hose (garden hose)				3 gallons per minute (with nozzle)	
	Wash dishes (dishwasher)				8 gallons per load	
	Wash dishes (kitchen faucet)				2.5 gallons per minute	
	Total					

Part I

Day 2

	Water Use	Part II	Part III			
		6	7	8	9	10
	Water Use	Water conservation action	Actual number of water uses	Time of actual water use	Estimated (or calculated) number of gallons used with conservation action)	Amount of water conserved
	EXAMPLE—Brush teeth (bathroom faucet)	**Turn off the water while brushing my teeth.**	**2**	**15 seconds each time, 30 seconds total**	**1.25 gallons** (2 x 15 = 30 seconds or 0.5 minutes; 0.5 minutes x 2.5 gallons per minute = 1.25 gallons)	**3.75 gallons** (5 gallons - 1.25 gallons = 3.75 gallons)
Personal	Brush teeth (bathroom faucet)					
	Toilet flush (toilet)					
	Wash hands (bathroom faucet)					
	Shower (showerhead)					
	Get a drink of water (kitchen faucet)					
Family	Use washing machine on largest load setting (washing machine)					
	Water lawn with sprinkler (sprinkler)					
	Wash car, dog, driveway, bike, etc. with hose (garden hose)					
	Wash dishes (dishwasher)					
	Wash dishes (kitchen faucet)					
	Total					

Water Savings Sheet—Student Copy Page

Bozeman Water Rates

0-7 HCF: $2.38 per HCF

8-15 HCF: $2.56 per HCF

15+ HCF: $3.02 per HCF

1HCF-748 gallons of water

Sample calculation:

In Part I, you left the water running for two minutes while brushing your teeth, using five gallons of water. You did that twice a day. Over a year, that adds up to 3650 gallons. At a price of $2.38 per HCF the yearly cost for the water to brush your teeth is $11.61.

2 minutes x 2.5 gallons per minute = 5 gallons (to brush teeth once)

5 gallons x 2 times per day =10 gallons per day

10 gallons per day x 365 days in one year =3650 gallons per year

3650 gallons/ 748 gallons (1 HCF) = 4.88

4.88 HCF x $2.38 = $11.61 per year

In Part III you turned off the water while brushing your teeth, running the water for only 15 seconds each time. This saved 15 gallons of water per day and $10.16 per year.

15 seconds x 2 time per day = 30 seconds or 0.5 minutes

0.5 minutes each day x 2.5 gallons per minute = 1.25 gallons per day

1.25 gallons x 365 days in one year =456.25 gallons per year

456.25 gallons/ 748 gallons (1 HCF) = 0.61 HCF

0.61 HCF x $2.38 = $1.45 per year

$11.61 - $1.45 = $10.16 per year

Your action will save your family $10.16 per year! If four people in your family do this, you save $40.64! ($10.61 x 4 = $40.64)

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1. Calculate how much money you saved by implementing water conservation methods. Choose three examples and calculate costs with and without conservation methods. Use a separate sheet of paper for your calculations.

2. How many gallons of water did you save in one day by practicing a few simple water conservation actions (total from Column 5 minus the total from Column 9)? How many HCF units?

3. How many gallons would your family save in one day if everyone participated in these water conservation actions? (Think about which water uses are per person vs. per family in your calculation.)

4. How many gallons would your family save in one month?

5. List at least five water conservation strategies for reducing your home water use that you would recommend to your family. For each, explain why it is beneficial. (How would you convince your family members to try it?)