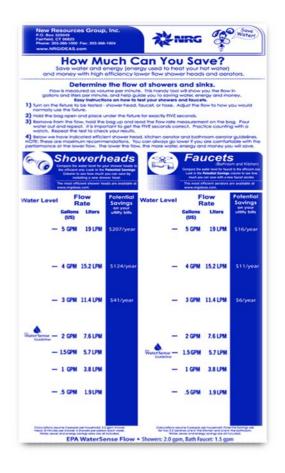# Water Scene Investigation Home Faucet Audit Procedure

Measure (Table 1): to determine how much water flows from the bathroom faucet in gallons per minute.

1. Examine the faucet for leaks:
   a. Look and feel around the faucet as well as under the sink along the drain pipe.
   b. Indicate the presence of leaks on your data sheet.
2. Measure the flow of water from the faucet for 5 seconds (you will need help from a family member):
   a. With the mixing bowl in the sink, turn on the faucet all the way.
   b. Put the opening of the flow rate measuring bag (page **Error! Bookmark not defined.**) under the running faucet and start the stopwatch simultaneously. (If you have a stopwatch, use it to time for 5 seconds, otherwise use a watch with a second-hand).
   c. Collect water for EXACTLY 5 seconds by counting aloud 1, 2, 3, 4, 5 in time with the stopwatch.
   d. On the count of "5," immediately remove the bag.
   e. Turn the water off.
   f. Read the water level from the flow rate measuring bag and record the measurement in gallons per minute (gpm) on the Faucet Audit Data Sheet.
   g. Pour the water from the measuring bag and mixing bowl into a bucket.
   h. Remind them to repeat this water flow measurement two more times for a total of three measurements.
   i. Average the three measured values. This is your Baseline Flow Rate.
3. Check for an existing faucet aerator.
4. If an aerator is on the faucet, remove it (mention they may have difficulty removing the old aerator and may need a tool). Hold up the pliers and ask "What is this tool called?"
5. Make a note of the aerator's condition.
6. Repeat directions in Step 2 to measure Flow Rate Without an Aerator and record your data.
7. Install a new aerator (Tell them to hand tighten 1.0 gpm aerator and NOT use the pliers).
8. Repeat directions in Step 2, recording the data. This is your Flow Rate With a New Aerator. Please leave the new aerator on if it's okay with your family.
9. Pour the water collected in the bucket on plants outside.
10. Complete Table 1 and the questions below it if you have time*.*

11. Return "old, used" aerators that were replaced and unused aerators to school.

Interview (Table 2): to determine how many minutes per day water flows from the bathroom faucet.

1. Start with the bathroom faucet that you think gets used the most; write down the faucet location.
2. Enter the names of all the users of this faucet, one in each section as you move horizontally across the data sheet. If you have more than three users, you will need a second data sheet.
3. Ask each user:
    a. "What do you use this faucet for?" For example, the uses could be to brush teeth, wash hands, wash face etc. Record this information under the column titled Water Use.
    b. "How many times each day is water used for this reason?" For example, if the user brushes his/her teeth twice a day, record the number 2 into the column titled # of Times per Day.
4. Time each water use, once for each user. You can measure the time using a stopwatch, clock or timer to capture the number of seconds the faucet is running. Record the amount of time the faucet runs in the column titled Duration for Each Time. (If you cannot time the water use, ask the water user to estimate how long the water is on for each use.)
5. Calculate the Total seconds per day that the water runs for each water use by multiplying the # of Times per Day value by the Duration for Each Time value.
6. Calculate the Each User's Total per Day by adding all the values in the Total Seconds per Day column. Each user will have their own Total per Day.
7. Calculate the total number of minutes per day that water flows from this faucet by adding all user's Total per Day, then dividing by 60 seconds/minute.

Calculate (Table 3): to determine whether the new aerator results in water savings

1. Copy:
    a. Total Time in min/day from Table 1 in to appropriate two boxes in Table 3.
    b. Average Flow Rate for Baseline Water Use from Table 2 into Table 3.
    c. Average Flow Rate for New Aerator Water Use from Table 2 into Table 3.
2. Calculate:
    a. Avg. Baseline Flow Rate X Total Time = Baseline water use/day
    b. Avg. New Aerator Flow Rate X Total Time = New Aerator water use/day
    c. Baseline water use/day – New Aerator water use/day = Water Savings
3. Mark the form for whether you will keep the new aerator on the faucet or not and enter the water savings in gallons per day.

Repeat: complete a separate data sheet for each bathroom faucet that will receive a new aerator. Each faucet may involve different water users and therefore different water use will be recorded.

Summarize: the overall impact of your Home Water Audit in the Faucet Water Audit Report (Appendix E)

Student Name: _____ Group ID: _____ Class Period: _____ Date: _____

Faucet Location: **kid's bathroom**

Table 1 Focus Question: How much water flows from the bathroom faucet when you turn it on?
(in gallons per minute = gpm)

	Baseline Flow Rate (how you found the faucet, i.e. may or may not have an aerator)				Flow Rate Without Aerator				Flow Rate With New Aerator			
	1	2	3	Avg.	1	2	3	Avg.	1	2	3	Avg.
☐	2.6	2.3	2.4	2.43	4.0	3.8	3.7	3.83	0.9	1.1	1.1	1.03

What is the **Average Baseline** flow rate? (gpm) = **2.43**   What is the **Average New Aerator** flow rate? (gpm) = **1.03**

Notes: (leak location, old aerator's condition, observations, etc.)

Table 2 Focus Question: How many minutes per day does water flow from this faucet on an average day?

	Water User #1: **Me**			Water User #2: **Sister**			Water User #3: _____		
	# of Times per Day	Duration for Each Time (*seconds*)	Total Seconds per Day	# of Times per Day	Duration for Each Time (*seconds*)	Total Seconds per Day	# of Times per Day	Duration for Each Time (*seconds*)	Total Seconds per Day
Brushing teeth	2 ✕	30	60	2 ✕	120	240	✕		
Washing Hands	5 ✕	15	75	4 ✕	20	80	✕		
Other uses: Washing face	1 ✕	60	60	1 ✕	45	45	✕		
Each User's Total Seconds Per Day	⇨⇨⇨⇨⇨⇨⇨		195	⇨⇨⇨⇨⇨⇨⇨		365	⇨⇨⇨⇨⇨⇨⇨		

Total *seconds* this faucet runs per day: **User #1's total + User #2's total + User #3's total = 560** sec/day

For how many *minutes* per day does water flow from this faucet? **Total seconds/60 = 9.33** min/day

Table 3 Focus Question: Does the New Aerator result in water savings?

Baseline Water Use			New Aerator Water Use		
Average Flow Rate (gpm)	Total Time min/day	Baseline Water Use per Day (Avg. x total time = gal/day)	Average Flow Rate (gpm)	Total Time min/day	New Aerator Water Use per Day (Avg. x total time = gal/day)
2.43 ✕	9.33	22.67	1.03 ✕	9.33	9.61

Change in daily water use due to aerator installation:

Baseline Water Use/day – New Aerator Water Use/day = 13.06 gal/day

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What will you do to use *LESS* water each day? Mark one of the following:

☐ Re-install OLD aerator = <u>0 gallons/day savings</u>   **X** Keep new aerator = **<u>13.06</u>** gallons/day water savings

_____ Old aerator has a lower flow rate.

_____ My family chose not to keep the new aerator.

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Student Name: _____ Group ID: _____ Class Period: _____ Date: _____

Faucet Location:_____

Table 1 Focus Question: **How much water flows from the bathroom faucet when you turn it on? (in gallons per minute = gpm)**												
	Baseline Flow Rate (how you found the faucet, i.e. may or may not have an aerator)				**Flow Rate Without Aerator**				**Flow Rate With New Aerator**			
	1	**2**	**3**	**Avg.**	**1**	**2**	**3**	**Avg.**	**1**	**2**	**3**	**Avg.**
☐												

What is the **Average Baseline** flow rate? (gpm) **= _____**   What is the **Average New Aerator** flow rate? (gpm) **= _____**

Notes: (leak location, old aerator's condition, observations, etc.)

Table 2 Focus Question: **How many minutes per day does water flow from this faucet on an average day?**									
	Water User #1: _____			Water User #2: _____			Water User #3: _____		
	# of Times per Day	**Duration for Each Time (*seconds*)**	**Total Seconds per Day**	**# of Times per Day**	**Duration for Each Time (*seconds*)**	**Total Seconds per Day**	**# of Times per Day**	**Duration for Each Time (*seconds*)**	**Total Seconds per Day**
Brushing teeth									
Washing Hands									
Other uses:									
Each User's Total Seconds Per Day	⇨⇨⇨⇨⇨⇨⇨			⇨⇨⇨⇨⇨⇨⇨			⇨⇨⇨⇨⇨⇨⇨		

Total *seconds* this faucet runs per day: **User #1's total + User #2's total + User #3's total= _____** sec/day

For how many *minutes* per day does water flow from this faucet? **Total seconds/60 =_____**min/day

Table 3 Focus Question: **Does the New Aerator result in water savings?**					
Baseline Water Use			**New Aerator Water Use**		
Average Flow Rate (gpm)	**Total Time min/day**	**Baseline Water Use per Day (Avg. x total time = gal/day)**	**Average Flow Rate (gpm)**	**Total Time min/day**	**New Aerator Water Use per Day (Avg. x total time = gal/day)**

Change in daily water use due to aerator installation:

Baseline Water Use/day – New Aerator Water Use/day = _____ gal/day Water Savings

What will you do to use *LESS* water each day? Mark one of the following:

☐ Re-install OLD aerator = 0 gallons/day savings   ☐ Keep new aerator = gallons/day water savings

_____ Old Aerator has a lower flow rate.

_____ My family chose not to keep the new aerator.

1. How many bathroom faucets did you audit? _____

2. How many water efficient aerators did you leave on your faucets? _____

3. How much water will your family save in gallons/day due to the installation of the new aerators?

Savings at Faucet #1		_____
Savings at Faucet #2	✚	_____
Savings at Faucet #3	✚	_____
Savings at Faucet #4	✚	_____
Total household water savings in gallons/day	＝	_____
	✖	**365 days/year**
		_____
How much water will you save in gallons/year?		_____

4. How many people live in your household? _____

5. How many people did you interview? _____

6. Did you encounter any problems when attempting this investigation? Please explain.

7. Did you discover anything new about how your family uses water and/or how to save water? Please explain.

Please enter your bathroom faucet water audit data for your home online at: https://arizonawet.arizona.edu/programs/wsi
or as directed by your teacher.

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