Water is one of our most precious natural resources. We use it for drinking, cooking, washing, cleaning, irrigation, and more. It's easy to waste water and to take water for granted. Water pours out of our faucets as though it were endlessly available. But the truth is that the supply of good quality fresh water is limited. Fortunately, it's just as easy to conserve water as it is to waste it.

This Water Investigation will help you identify current water use practices in your school and will start you thinking about how you can modify those practices to conserve water.

School Name: _____ **Date:** _____

Green Team:

(Please include administrators, teachers, school staff, students, and parents involved in this investigation.)

Name	Title/Role
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

School Population:

Students: _____   Staff: _____

A. Water Source, Quality, and Quantity

1. **In which watershed is your school located?** You can use the following U.S. EPA website to locate your watershed: http://cfpub.epa.gov/surf/locate/index.cfm.

2. What is the name and what is the approximate distance of the closest body of water to your school? (For example, stream, river, lake, aquifer)

3. What is the source of your school's drinking water supply?

    ❏ Municipal water supply
    ❏ School has its own well

4. If the school's drinking water comes from a municipal supply, what is its source?

    ❏ Groundwater (well, aquifer)
    ❏ Surface water (lake, river, reservoir)

5. Where does water used in your school go (wastewater)?

    ❏ Municipal sewer system; name: _____
    ❏ Onsite septic system and drainage field
    ❏ Holding tank

6. If the school's drinking water comes from the school's private well, who monitors and tests the water quality? How often is the water quality tested?

    _____

7. If the school's drinking water comes from a municipal supply, what is the name of the supplier? How often is the water quality tested?

    _____

8. Obtain a copy of your school's water quality test report, and use it to complete the **Water Quality Test Results** chart that follows.

    If the school's water comes from a municipal supply, a water quality report should be available to the public. The reports are often mailed to customers and made available at the supplier's website. If the school's water comes from a well, routine water quality tests should be performed, and the test results should be available from the testing lab. To view a sample water quality report for the town of Vienna, Virginia, visit www.viennava.gov/archives/47/water_report_2011.pdf.

Water Quality Test Results

Using your school's water quality report, list the contaminants that are analyzed, and note if the contaminant was detected. Also note if the contaminant exceeded allowable standards. A few examples of contaminants are provided on the chart.

Contaminant Name	Was the contamination detected? Yes/No	Was the action level set for the contaminant exceeded, causing a violation? Yes/No
E. coli bacteria		
Coliform bacteria		
Arsenic		
Barium		
Cadmium		
Chromium		
Copper		
Cyanide		
Disinfection byproduct		
Fluoride		
Lead		
Nitrate		
Nitrite		
Selenium		
Others:		

A. Water Source, Quality, and Quantity (cont.)

9. Using information from your school's water bills, record how much water your school used last year
(note: 1 cubic foot = 7.48 gallons)

   _____ gallons   _____cubic feet

10. Using information from your school's water bills, record approximately how much your school pays for drinking water each month. $_____

   How much did the school pay for drinking water last year? $_____

11. Are students and staff members encouraged to conserve water?

   ❑ Yes
   ❑ No

   If yes, briefly explain how:

12. Use the **Schoolwide Water Devices** chart that follows to record how many water-using devices your school has and if any of the devices are leaking. Use the **Classroom Water Devices** chart to record information about water-using devices in each classroom.

Schoolwide Water Devices

In the **Total Number** column, write the number of each device found at that location, and indicate with an "A," "S," or "M" if the device uses Automatic, Sensor, or Manual equipment to operate.

> **A = Automatic:** equipment that must be turned on manually but turns off automatically or that is on a timer
>
> **S = Sensor:** equipment that turns on and off on the basis of movement of the person using the equipment
>
> **M = Manual:** equipment that must be physically turned on and off by user

In the **Number Leaking** column, indicate the number of devices that are leaking or dripping.

Location	Faucets		Water Fountains		Toilets/Urinals			Other	
	Total Number/ A – S – M	Number Leaking	Total Number/ A – S – M	Number Leaking	Total Number/ A – S – M	Number Leaking	Gallons per flush	Total Number/ A – S – M	Number Leaking
Classrooms *									
Bathroom 1									
Bathroom 2									
Bathroom 3									
Bathroom 4									
Bathroom 5									
Bathroom 6									
Hallways									
Cafeteria									
Gymnasium									
Other:									
Other:									
Other:									

*Use the **Classroom Water Devices** chart that follows if the classrooms in your school have sinks, water fountains, or bathrooms. Compile the data from the **Classroom Water Devices** chart, and insert the totals on the **Classrooms** line of this chart.

Classroom Water Devices

In the **Total Number** column, write the number of each device found at that location, and indicate with an "A," "S," or "M" if the device uses Automatic, Sensor, or Manual equipment to operate.

   A = **Automatic:** equipment that must be turned on manually but turns off automatically or that is on a timer

   S = **Sensor:** equipment that turns on and off on the basis of movement of the person using the equipment

   M = **Manual:** equipment that must be physically turned on and off by user

In the **Number Leaking** column, indicate the number of devices that are leaking or dripping.

Location	Faucets/Sinks		Water Fountains		Other	
Classroom Number	Total Number/ A – S – M	Number Leaking	Total Number/ A – S – M	Number Leaking	Total Number/ A – S – M	Number Leaking

A. Water Source, Quality, and Quantity (cont.)

13. Using the **Schoolwide Water Devices** chart, record how many faucets out of the total number of faucets are leaking:
_____

    What percentage is this? _____

14. Using the **Schoolwide Water Devices** chart, how many toilets or urinals out of the total number of toilets or urinals are leaking? _____

    What percentage is this? _____

15. On average, how much water do the school's toilets or urinals use per flush?
    (Ask members of your school building maintenance staff to help you find this information. It may be noted on the device.)
    ❏ >5 gallons
    ❏ 3–5 gallons
    ❏ 1–2 gallons
    ❏ <1 gallon

16. Does your school have low-flow showerheads installed in the shower areas?
    ❏ Yes
    ❏ No

17. Does your school have a swimming pool?
    ❏ Yes
    ❏ No

    If yes, answer the following questions:

    How many gallons of water does it take to fill the pool?
    Because every square foot that is 1 foot deep can hold 7.5 gallons, you can use the following equation to figure out how many gallons of water it takes to fill your school's pool:

    Length (in feet) x Width x Average Depth x 7.5 = _____ gallons of water to fill pool

    How often is the pool water changed? _____

A. Water Source, Quality, and Quantity (cont.)

18. Determine the water flow rates for faucets and showerheads at your school.

Flow rates in the United States are measured in gallons per minute (GPM). To determine flow rates, you will need a stopwatch or a watch with a second hand. You will also need an empty gallon bucket for determining the flow rate of a showerhead and an empty quart container for determining the flow rate for a faucet with a shallow sink.

Turn on the fixture to its normal position, place the empty container under the fixture, and time how long it takes to fill it. If you used a gallon container, you will already have the flow rate in gallons per minute. If you used a quart container, convert the measurement to gallons.

Record the results below.

Faucet #1, Bathroom:_____GPM

Faucet #2, Cafeteria:_____GPM

Shower:_____GPM

Federal guidelines mandate that all lavatory and kitchen faucets and all faucet aerators manufactured and sold in the United States after January 1, 1994, must use no more than 2.2 gallons per minute. In addition, metering faucets (those that—when activated—dispense water of a predetermined volume or for a predetermined period of time) must discharge no more than 0.25 gallons per cycle. Federal guidelines also mandate that all showerheads manufactured and sold in the United States after January 1, 1994, must use no more than 2.5 gallons per minute.

19. **Brainstorm,** and then record a list of ways that your school could conserve water and improve the water-using fixtures.

B. Water Usage on School Grounds

1. How many water faucets are located outside the school building? _____

   How many of those are leaking? _____

   How many have been secured so that only school staff members may turn them on or off? _____

2. Does the school staff use hoses to wash sidewalks and parking areas?

   ❏ Yes
   ❏ No

3. Does your school building have gutters and/or downspouts?

   ❏ Yes
   ❏ No

   If yes, is this water collected and reused? (For example, roof runoff from rain is collected in a rain barrel for later use to water flowers or a garden.)

   ❏ Yes
   ❏ No

4. Where does water go that runs off the school's roof, parking lots, and grounds?
   (Check all that apply.)

   ❏ Storm drain

   ❏ Recessed grassy areas

   ❏ Rain garden

   ❏ Retention pond

   ❏ Drainage ditch

   ❏ Natural pond, stream, or wetland

5. Does your school have a plan for managing and reducing runoff from school grounds?

   ❏ Yes
   ❏ No

B. Water Usage on School Grounds (cont.)

6. Are lawns and athletic fields managed in a way that conserves water? (For example, if fields must be watered, is this done during the cooler parts of the day to minimize evaporation loss?)

   ❏ Yes
   ❏ No

7. **Brainstorm,** and then record a list of ways that your school could improve water conservation on the school grounds.

C. Education, Training, and Community Connections

To answer the following questions, you may want to interview the staff member who manages the school's environmental policies and teacher training. Information on academic standards may be available on school websites.

1. Do your school's academic standards include water conservation education?

   ❏ Yes
   ❏ No

   If yes, in which grades is it taught? _____

2. Has your school staff participated in any professional development that includes water education?

   ❏ Yes
   ❏ No

3. Does your school participate in any water projects that benefit the community (for example, erosion control through plantings, stream cleanup, or water monitoring)?

   ❏ Yes
   ❏ No

   If yes, list the projects here.

4. Some water management facilities can be used as educational resources. Which are found in your community?

   Drinking water treatment plant   Yes _____   No _____   Location: _____

   Wastewater treatment plant   Yes _____   No _____   Location: _____

5. Has your school or class ever taken a tour of any of those facilities?

   ❏ Yes
   ❏ No

6. Does your school website, or other media outlet, such as a newsletter, emphasize the school's water conservation goals or programs?

   ❏ Yes
   ❏ No

7. **Brainstorm,** and record a list of ways that your school could improve its water education, community outreach on water conservation, and community water conservation projects.

Water Action Plan

Review the list of ideas for improving water conservation at your school that you brainstormed for each section of this investigation. Prioritize the ideas listed, and decide on a few action projects that could be done to improve water conservation at your school.

List your action project ideas for each section of the Water Investigation:

Water Source, Quality, and Quantity (Section A):

Water Usage on School Grounds (Section B):

Education, Training, and Community Connections (Section C):

Water Action Project Ideas

Here are just a few ideas to help get you started. Students will come up with many more ideas and you can check out what other PLT GreenSchools! are doing too! Visit www.plt.org/greenschools-stories.

- Encourage others to conserve water through your use of poster contests, school TV broadcasts, local TV broadcasts, school and local newspaper articles, persuasive essays, public service announcements, poetry, posters, and assemblies.
- Install signs in all restrooms that encourage water conservation.
- Work with school administrators to install low-flow faucets, toilet tanks, and showerheads.
- Work with school administrators to install automatic or sensor faucets to reduce water waste.
- Investigate and repair leaking fixtures (with the help of school maintenance staff members or a custodian).
- Install rain barrels to capture rain runoff from roofs and gutters for use in school and community gardens.
- Install a rooftop garden to capture rain and to reduce runoff.
- Use mulch around schoolyard plants and gardens to conserve water.
- Plant native vegetation that is adapted to local rainfall amounts and climate because it needs less watering.
- Build a rain garden to improve the health of your local watershed.
- If grassy areas must be watered, encourage watering during the cooler parts of the day to minimize water evaporation loss.
- Use drip irrigation systems rather than conventional sprinklers to conserve water.
- Encourage the sweeping of sidewalks and parking lots instead of using running water to clean them.