From the Mountains to the Estuary: From the Schoolyard to the Bay

Meaningful Watershed Experiences
for Grade 6 Students

Created by:

Prince William County
PUBLIC SCHOOLS
Providing A World-Class Education

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NATIONAL WILDLIFE REFUGE SYSTEM

**Occoquan Bay National Wildlife Refuge
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NATIONAL PARK SERVICE

Water Conservation
Saving a Precious Resource

Overview
Students will calculate how much water they use in their schools and in their homes. They will then come up with ideas to conserve water.

Materials
- Data sheets
- Composition Notebook

Teacher Background
From http://ga.water.usgs.gov/edu/wateruse2000.html

"A report by the U. S. Geological Survey (USGS), "*Estimated use of water in the United States in 2000*" (USGS Circular 1268), shows that about **408 billion gallons of water per day** were withdrawn for use in the United States during 2000. Withdrawals in 1990 averaged nearly 1,620 gallons per day per person; in 2000, the per capita average had declined to about 1,430 gallons per day. During the same decade, the United States experienced a population increase of about 33 million. Total withdrawals increased steadily from 1950 to 1980 but have varied less than 3 percent since 1985."
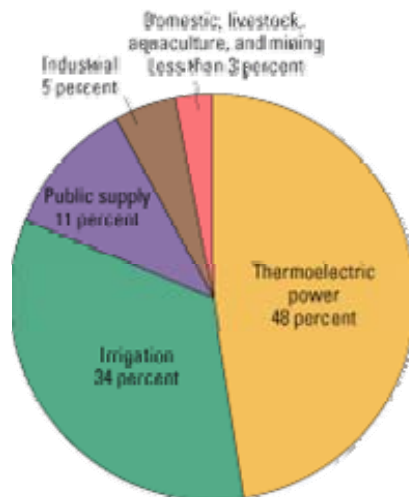
Setting the Stage

Begin by showing the class one gallon of water. Asking students to estimate the amount of water they use each day. Have students write down their estimates and put them aside for future reference.

Acquisition of Learning
1. In cooperative groups of three students, ask the class to brainstorm all the ways they can think of that they use water every day. Have them record the information in their notebooks.

2. Compile a class list of the answers the groups made.

3. Ask the students to share the amounts of water they estimated they used at the beginning of class.

Chart of Water Use by Fixture

Fixture	Fixture Rate
Non low-flow toilet (old)	5 gallons per flush
Low-flow toilet (new)	3.5 gallons per flush
Ultra low-flow toilet	1.5 gallons per flush
Regular shower head	7 gallons per minute
Low-flow shower head	2 gallons per minute
Bathtub filling	3.0 gallons per minute
Clothes washer	37 gallons average load
Dish washer	15 gallons average load
Faucet	3 gallons per minute

4. Show the gallon jug again; explain that two-thirds of the people in the world use just thirteen gallons of water each day. Ask how this compares with their estimates.

5. Explain that they are going to estimate the number of gallons the students at the school use each day. Have the students write down a prediction in their notebooks.

6. Next, let the students brainstorm to figure out what information they need to calculate the amount of water the school uses in one day.

7. *(Information should include: # of students in the school; Average number of times student uses bathroom; # of minutes wash hands; # of gallons used by flushing toilet; # of gallons used by washing hands; # of students that drink from water fountains; Amount of water from water fountain)*

8. The students can use estimates or actually measure quantities like amount from faucets and water fountains.

9. Have the students calculate the estimated number of gallons used by the students at the school each day.

10. Discuss the number that the students calculate. Is it lower or higher then what they calculated? What other ways is water being used at the school that they didn't figure into the equation? (*cafeteria, teachers, lawn care, generating electricity…*)

1. Now explain that they are also going to calculate the number of gallons of water their family uses in one day.

2. Give each student a worksheet to take home to record their information.

Closure
Discuss the results that discovered at home. Explain that in the US most people use about 80-100 gallons of water per day. Is their average the same or higher or lower?

Have the students write in their composition book five ways that they can conserve water.

Extensions
Have students research where their drinking water comes from at their home and school. Is it pulled out of a local river or well? If so, which one?   How much does water cost per month for each person at home or school?

Name: _____

Example Worksheet:
Bathroom:

　　　　Toilet: 18 flushes X 5 gal/flush = 90 gal

　　　　Sink: 6 minutes X 3 gal/min = 18 gal

　　　　Shower: 25 minutes X 5 gal/min = 125 gal

Kitchen:

　　　　Sink: 6 minutes X 3 gal/min = 18 gal

　　　　Dishwasher: 1 cycle X 15 gal/use = 15 gal

Other:

Laundry: 1 cycle X 37 gal/use = 37 gal

90
+
18
+
125
+
18
+
15
+
37
=
303 gal Total Use

　　　　Per-person Rate = 303 gal / 3 people = 101 gallons per person

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Student Worksheet　 Keep a tally of the items listed below. Insert the gallons used for each activity and multiple to find the total number of gallons used for each item.

Bathroom:

　　　　Toilet ___ flushes X ___ gal/flush = ___ gal

　　　　Sink ___ minutes X __ gal/min = ___ gal

　　　　Shower ___ minutes X __ gal/min = ___ gal

Kitchen:

　　　　Sink ___ minutes X __ gal/min = ___ gal

　　　　Dishwasher ___ cycle X __ gal/use = ___ gal

Other:

　　　　Laundry ___ cycle X __ gal/use = ___ gal

　　　　　　　　　　　Total Use ____ gal

Per-person Rate ____ gal / ____ people =____ gallons per person