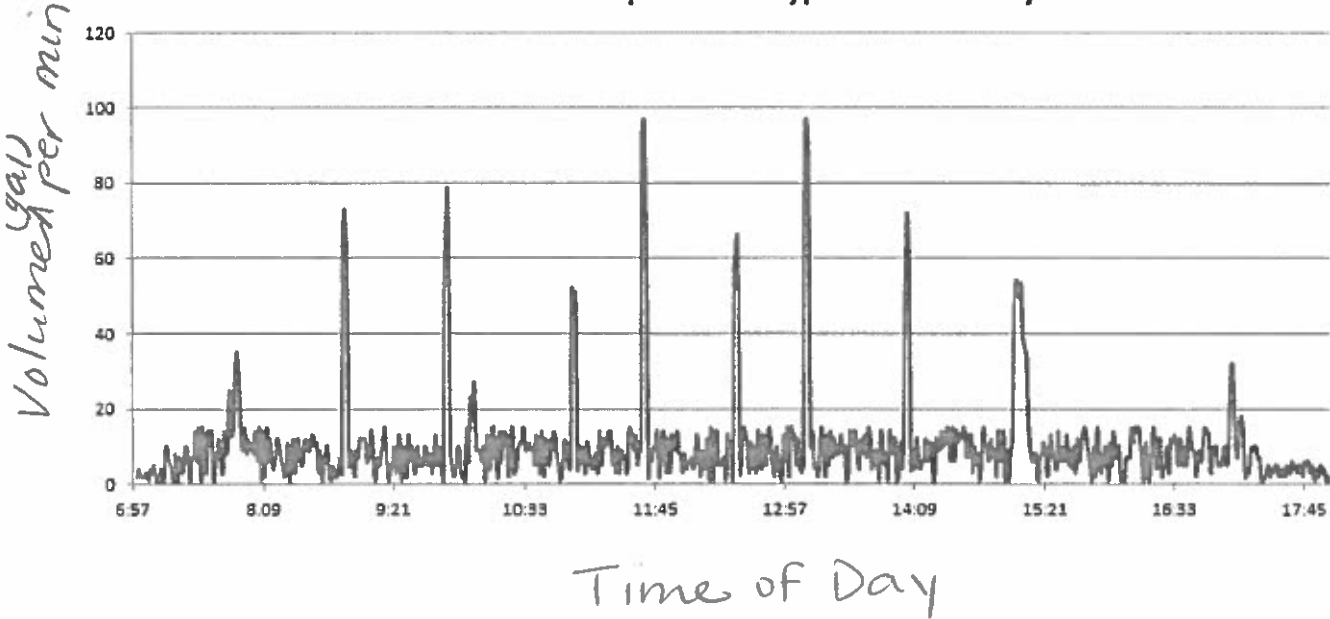


Water Consumption in a Typical School Day



a. For what purposes do you think is water mostly used at the school?

bathroom use

b. What could be the reason for the spikes in the graph?

passing periods

More Information About the School

- Regular school day hours: 8:00am - 3:04pm
- After school activities: 3:15pm - 5:15pm
- Around 10am there is a 13min advisory/homeroom period.

c. What features of the graph support this information? Why?

- spikes before 8am, after 3pm
- spikes after 5:15pm
- spike around 10am

People use the RR before + after activities.

d. What do you think the lunch schedule is like at this school? Why?

Lunch happens in shifts, maybe 11, 11:45, 12:30, 1:15 because of midday spikes.

More Information about How the Researchers Collected the Data

The water meter shows the total amount of water (in gallons) that has left the school since the time the meter was last reset. Since the researchers do not know when the meter was last reset, they measured how the meter reading increased over the next minute of time.

a. For the period from 10:00am - 10:01am, how much water flowed out of the school?

80 gal

b. The bulk of water usage is due to flushing toilets. Each flush uses 2.5gal of water. A researcher estimates that 2% of the school population uses the bathroom 10:00am and 10:01am, right before homeroom. What is a good estimate of the population of the school?

$$\frac{80 \text{ gal}}{2.5 \text{ gal/flush}} = 32 \text{ flushes}$$

<u>Percentages</u>	
$\frac{\text{is}}{\text{of}}$	$= \frac{\%}{100}$

~~$$\frac{32}{x} = \frac{2}{100}$$~~

$$\frac{2x}{2} = \frac{3200}{2}$$

$$x = 1600 \text{ students}$$

c. Assume there are 80 toilets in the school. Make a guess as to what percentage of students may use the bathroom at break times between classes, just before school, and just after school. Are there enough toilets for the number of students who want to use them at these times?

Assume 20% of school uses RR during passing period.

~~$$\frac{x}{1600} = \frac{20}{100}$$~~

$$\frac{100x}{100} = \frac{32000}{100} \quad x = 320$$

No, 320 students can't use 80 toilets at the same time.

d. Let's say the break time between classes is 5min, and each person who wants to use it only needs 1min. Are there enough toilets for the number of students who want to use them, given this consideration? In a given minute during break time, how many flushes would you expect?

$$\frac{320 \text{ people}}{5 \text{ min}} = 64 \text{ people/min}$$
$$= 64 \text{ flushes/min}$$

Yes, 64 students can use 80 toilets per minute.

e. Assume each flush uses 2.5gal of water. Estimate the amount of water being used during a given minute of break time.

$$64 \text{ flushes} \cdot 2.5 \text{ gal/flush} = 160 \text{ gal}$$