

Calculating Water Flow Rate

Objective: Try to come up with an estimate for how much water we use during the day. To do this, we need to practice calculating flow rate. Go to one of the six lab stations around the room. Each lab station should have a prepared milk jug/2L bottle with a hole in the bottom covered with tape, a timer, a bowl or large beaker, and a graduated cylinder.

1. Hold the gallon jug above the bowl or large beaker. Remove the tape and start the timer.
2. After 1 minute, place your finger over the hole on the bottom of the jug to stop the water. Hold the jug over the sink. Tilt the jug to the side so the tape can be replaced. Refill the jugs to the line marked on the side of the container.
3. Use a graduated cylinder to measure the water that was collected. The amount of water collected is labeled mL/min. This can be converted to L/min. by dividing by 1,000.
 _____mL/min or _____L/min
4. You can measure the flow rate of the classroom sinks by timing how long it takes for a 500 mL beaker to fill. Divide 500 by your time. The answer will be in mL/sec. This can be converted to mL/min. by dividing the answer by 60. And converted to L/min. by further dividing it by 1,000.
 _____mL/sec or _____mL/min or _____L/min
5. This method can be used to find the flow rate of drinking fountains, or any other water source in the building. Use smaller beakers or cups as needed.

6. Next, try to find the flow rate for your shower and bath at home. Cut the top off of a milk jug. Fill the milk jug with 1 L of water and mark the line of the outside. Time how long it takes to fill up 1 L of water.

- One toilet flush uses 5 gal. of water.
- A 10-minute shower uses 100 gal. of water.
- To fill half a full bathtub takes 50 gal. of water.
- Brushing teeth takes 2 gal. of water.
- The dishwasher uses 10 gal. of water.
- A clothes washer uses 50 gal. of water.

7. On average, each of us uses about 70 gal. of water every day. Using the above information, calculate your daily water use. Use your own data collected to figure out how much your shower uses.

Fun Fact: In pioneer days, it is estimated that people used only 5 gal. of water per day.

8. Look for places in your day where you can reduce water use.