# DISHWASHING

Bill and Mary both have to do the supper dishes for their families.

- Mary fills one sink full of water. She then turns the tap and lets the water run into a second sink and down the drain while she is washing dishes. She rinses each dish as it is cleaned under the running water. The tap is running constantly for 15 minutes every time she does dishes.
- Bill fills one sink full of water, then loads the soapy dishes into a rack in the second sink. When the rack is full, he uses a sprayer to rinse off all the dishes in the rack at once. He uses the sprayer for one minute. It takes five minutes to fill one sink. The flow of water from the tap is about 100 mL per second.

1. How much water does Mary use every time she does the dishes? What number of 500mL bottles is that equivalent to?

2. How much water does Bill use every time he does the dishes? What number of 500mL bottles is that equivalent to?

3. How much MORE water does Mary use every year? How many 500mL bottles is that?

4. How could you reduce the amount of water you use when you wash your hands?

5. How could you reduce the amount of water you use when you shower?

**MATH ACTIVITY**

# TOOTH BRUSHING

Bill is trying to use less water in the activities he does every day. Mary does not worry about it because she does not think it makes a difference. For the problem below, calculate how much more water Mary uses each time she brushes her teeth.

Bill wets his toothbrush, then turns the water off until he needs to rinse his toothbrush and his mouth. The water is running for about five seconds. Mary leaves the water running for the whole time she is brushing her teeth, for about one minute. Water flows from the bathroom taps at about the rate of 100 milliliters (mL) per second. They each brush their teeth after every meal, or three times per day.

1. What volume of water does Bill use every time he brushes his teeth? How much is that per day? What number of 500mL bottles would this be equivalent to?

2. What volume of water does Mary use every time she brushes her teeth? How much per day? What number of 500mL bottles would this be equivalent to?

3. How much more water does Mary use per year? How many 500mL bottles does that make?

# Multi Grade Variations on Math Activity Tooth Brushing

| K – Grade 3 | Grade 4- 6 | Grade 7 -8 |
|---|---|---|
| Demonstration, measuring. | 3 approaches:<br>using a calculator<br>paper calculation<br>mental math | Same as for grades 4-6. Increase calculations. |
| • Plug two sinks that are side by side.<br>• Sink 1- child pretends to be Bill brushing teeth. As water runs, children count to 5 (1000, 2000…).<br>• Sink 2 – child pretends to be Mary. As water runs, use timer or count to 60.<br>• Compare the amount of water in each sink: which method uses more water? Which way would you choose to save water?<br>• Remove and measure the water in the two sinks. | The problem: for Bill<br>• 100mL/sec x 5 sec= total amount of water used.<br>100 x 5 = 500mL<br><br>The problem: for Mary<br>• 100mL/sec x 1min= total amount of water used.<br>• 100mL/sec x 60 sec=<br>100 x 60 = 6000mL<br><br>Changing mL to L:<br>There are 1000mL in a L:<br>Bill uses half a litre.<br>Mary uses 6 litres.<br><br>**Note**: When we do this activity we use 500mL water bottles to show how much water each uses. i.e. Bill uses the equivalent of one bottle of water and Mary uses 12 bottles of water each time they brush. | Calculate the problem as in gr. 4-6.<br><br>Add calculations for per day use and per year use. For Bill:<br>• .5Lx 3=1.5L/day<br>1.5 x 365=547.5L/yr<br><br>For Mary:<br>• 6Lx 3=18L/day<br>18Lx 365=6570L/yr<br><br>How much more does Mary use?<br>6570-547.5=6022.5<br><br>**Note**: When we do this activity, we may look at the 20L water jugs or 2L pop bottles and estimate how many of those each is using per year.<br><br>Calculate the utility cost of the water each is using per year:<br>Tap water is < 1¢ (approx .2 ) per litre. For Bill:<br>547.5x.2=109.5¢ or $1.10<br><br>For Mary:<br>• 6570x .2=1314¢ or $13.14 |

# Tap Water vs Bottled Water

| Tap Water | Bottled Water |
|---|---|
| **Cost:**<br>$0.0016/litre<br>$0.007 for 4 litres<br>(March 2011) | **Cost:**<br>(Co-op gold, purchased at Co-op)<br>$3.69 for 12-500ml bottles<br>$0.31/ bottle<br>$0.62/litre<br>$2.46 for 4 litres<br>(March 2011) |
| **Testing Requirement:**<br>At least daily | **Testing Requirement:**<br>At least weekly |
| **Embodied Energy/ Footprint:**<br>Water collected from River at Saskatoon, treated at Saskatoon, pumped to homes and businesses. | **Embodied Energy/ Footprint:**<br>Water collected from Kawkawa Spring, BC.<br>Water treated where?<br>Plastic bottle (made from petroleum) produced where?<br>Bottled water shipped to Saskatoon.<br>Empty bottle recycled or landfilled. |

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# Earth's Fresh Water

- The two litre pop bottle represents all of the water on earth.
- The bottle cap filled with water represents the amount of FRESH water on earth.
- A few drops of water from the bottle cap represents how much water is AVAILABLE for human use.

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# Water Conservation Workstation

## Look for the problem (Audit)

- Are staff and students running the water excessively (Don't Run the Water pre-campaign audit)
- Are staff and students drinking tap water or bottled water (Refillable Water Bottles pre-campaign audit)
- Home water audit

## Fix the problem (Campaign)

- Don't Run the Water campaign
- Refillable Water Bottles campaign