

# THE TRUE COST OF WATER

GRADES 3-8

## MATERIALS

- Math supplies (pencils, paper, calculators)
- Yardstick
- Construction paper, scissors, and tape for the bar graph (optional; see step 7)

## BACKGROUND

This video is a fun, high-energy celebration of tap water, encouraging students to drink water “straight from the spigot” instead of buying it in a disposable bottle. The main take-home message behind the catchy song and clever visuals is a positive one: tap water tastes good, is healthy to drink, and is immediately available.

Although bottled water may sometimes seem more convenient than tap water, and is often packaged to seem “better,” there are many serious reasons to avoid it. Bottled water is regulated differently than tap water, but not more stringently; on the contrary, multiple studies suggest that the federal regulations for tap water make it safer and healthier than bottled water, especially since the plastic bottling process adds contamination risks. In addition, bottled water is much more harmful to the environment, since it wastes nonrenewable resources at every step of production and produces millions of plastic bottles that end up as litter and garbage. And, of course, it costs much more than tap water, often thousands of times more. For the sake of the environment we share, we have to cut down on consuming bottled water. Tap water is a delicious, refreshing, inexpensive, and convenient alternative!

## TEACHER PREPERATION

- Note that this activity requires a basic understanding of unit conversion, giving students practice at converting prices per various volumes into prices per gallon. Students should be introduced to the unit conversion process prior to beginning this activity.
- Note also that the activity is designed to be carried out over two class periods.

### CONVERSION FIGURES

1 gallon (gal) = 3.785 liters (L)

1 liter (L) = 0.264 gallons (gal)

### OTHER HELPFUL CONVERSIONS

1 quart (qt) = 32 fluid ounces (fl oz)

1 gallon (gal) = 4 quarts (qt) = 128 fluid ounces (fl oz)

1 liter (L) = 1000 milliliters (mL)

## SESSION 1 INSTRUCTIONS

1. After watching the video, comment on how the song uses lyrics like “You don’t even have to pay” and “It’s free, free, free!” as incentives to drink tap water. Discuss how that’s not completely accurate (even tap water costs something, usually appearing on a utility bill), but how it’s still pretty clear that bottled water costs more.
2. Challenge students to find out just how much water costs from different sources. Split students into small groups (3-4 students), with each group getting a different water source to investigate. If possible, all students in each group should investigate the price, to obtain as much data as possible. At the next session of the activity, all students will report back with their findings from the sources:
  - A concession stand at a sporting event
  - A vending machine
  - A gas station or convenience store
  - A grocery store
  - A “big box” retailer (Walmart, Target, etc.)
  - Municipal tap water
3. Note that not all water is sold in the same volume: for example, the students might see half-liter bottles, gallon bottles, or even 5-gallon containers. So, using the “True Cost of Water” data sheet, students should write down not only the price they see, but how much water is actually being sold.
4. Remind students to bring their findings to Session 2 of the activity.

## SESSION 2 INSTRUCTIONS

1. Have students get out their completed charts. Remind them about how different volumes are sold.
2. Explain that the class is going to use their unit conversion skills to calculate water prices on an equivalent basis, so that they can see how much each source charged per gallon (or alternatively, per ounce).
3. Refresh their memories on unit conversion if necessary.
4. Circulate around the room as the students use unit conversions to calculate water prices per gallon (and/or per ounce). Instruct students to show their step by step calculations on the bottom half of the data sheet. Once prices per gallon are calculated, fill in these values in the far right column of the chart.
5. Reconvene the small groups, so that the students in each group can compare their answers and, if different prices were found, calculate an average.
6. Collect the prices per gallon (and/or per ounce) from each group, writing both the source and the price on the board to create a list showing how much water costs from different sources.

7. Have students make a bar graph, illustrating the differences in prices. The bar graph can be drawn on the board using different colored markers (or, if a blackboard, different colored chalk), or can be created out of colored sheets of construction paper as a wall decoration. Depending on how much time is available, there are multiple ways to design the bar graph:

- Students can show how much money one gallon (or one ounce) costs from each source, using the yardstick to visualize the different amounts of money as bars on a graph. (If space permits, they can allot 1 foot for each dollar; if not, a smaller length can be used.)
- If more time is available, students can do another set of unit conversions to find out how much water one dollar will buy from each source. Then they can create the bar graph using bar lengths to represent amounts of water. This version gives students more math practice, and also makes a dramatic illustration of how far one dollar goes at each source. (Be prepared to have a long length available for the municipal tap water bar!)

Name \_\_\_\_\_

## "THE COST OF WATER" DATA SHEET

| Water Source                         | Price         | Volume (Be sure to indicate units) | Price per Gallon |
|--------------------------------------|---------------|------------------------------------|------------------|
| <i>Example: Caseys General Store</i> | <i>\$1.29</i> | <i>1L</i>                          | <i>\$4.88</i>    |
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### SHOW CALCULATIONS

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