



A Drip in Time Saves Nine

Objective:

Students will understand how a small leak adds up. Draw conclusions about how small leaks in several homes can total massive quantities of wasted water. Why we conserve water will be discussed.

Key Vocabulary:

Conservation - the use of water-saving methods to reduce the amount of water needed for homes, lawns, farming and industry, and thus increasing water supplies for optimum long-term economic and social benefits.

Ground Water - water that has been absorbed into the soil and is contained in rock pores, cracks and crevices in rock formations, sand, gravel and other porous materials. Aquifers are one kind of groundwater. Water from wells or springs are ways of tapping groundwater.

Watershed - the land area from which surface runoff drains into a stream channel, lake, reservoir, or other body of water; also called a drainage basin.

Materials:

- Leak Detection Sheets – 1 per student
- Measuring Cup (oz & ml)
- Plastic Cups (20 oz best)
- Water – 1 gallon
- Stop Watch or wall clock with a second hand
- Calculators

Set up for each group of children (keep the groups to 3 or 4 students)

- Plastic cup with small hole in bottom (mark “LEAK”)
- Two cups with no holes (mark one “Water Main” and one “Bucket”)
- Water should be placed in “Water Main” cup
- Calculator (one per group minimum – one per student preferred)
- Leak Detection Sheet – 1 per student in group

Procedure:

1. Introduce the lesson by asking the students if they can remember seeing a faucet dripping at home or anywhere else. Ask the students to guess how much water they think might be wasted in a day from a slow drip.
2. Write down the estimates on a board/flip chart to use for comparison later.
3. Discuss what happens to the water that is dripping from the leak.
*Point to remember – Water is not captured immediately back into the water cycle.
4. Divide the class into groups of three or four.
5. One student from each group should fill up one of the cups with water (marked “Water Main”). Tell the students that the plastic cup (marked “LEAK”) has a tiny hole in its bottom that will allow the water to leak out the same way that water drips from a leaky faucet. Another student can serve as a timekeeper for a one-minute period.
6. At the beginning of the minute, ask the students to fill the cup “LEAK” cup with water. **Make sure that cup “LEAK” is held over the empty larger cup without a hole (marked “Bucket”).** At the end of one minute, move the cup “LEAK” from the cup marked “Collection Cup” catching the drips and pour the water still remaining back into the cup marked “Water Main”.
Please visit our web site at www.Aquarionwater.com for more water lessons.
7. Have the students estimate the number of milliliters (or ounces if preferred) in the “Bucket” cup. Have them record their estimate on the top of the leak detection sheet.
8. Pour the water from the “Collection Cup” into a measuring cup. Record the number of milliliters collected (you can use the ounce side depending on age level of children – the hole in the leak cup will need to be much bigger if recording in ounces).
9. Calculate the gallons of water wasted in one day with the following formula: (use leak detection sheet attached for each student in each group):
 - A. **Number of Milliliters x 1440 minutes (24 hours) = milliliters wasted in one day**
 - B. **Milliliters wasted in one day divided by 30mLs (equal to one ounce) = number of ounces wasted in one day**
 - C. **Number of ounces wasted divided by 128 (equal to the number of ounces in 1 gallon) = number of gallons wasted in a day**
10. Now take the number of gallons for one house for one day and expand the idea to many days and many houses.

Variation: Using 3 eyedroppers and count 60 seconds of drops. You must have at least 6 eyedroppers filled with water using one set at a time. This should allow enough water dripping for 1 minute of time.

Leak Detection Data Sheet

Student Name: _____

Record your estimate of water in the “Bucket” cup collected in one minute. (Remember you are estimating milliliters.) _____

1) Milliliters (Amount recorded in the measuring cup)

X 1440
=====

Minutes in 24 hours

Milliliters wasted in one day.

2) Milliliters wasted in one day (*answer from question #1*)

+ 30
=====

Milliliters equal to one ounce

Number of ounces wasted in one day

3) Number of ounces wasted in one day (*answer from question #2*)

+ 128
=====

Number of ounces in 1 gallon

Number of gallons wasted in a day

Take your answer for #3, which equals the number of gallons wasted for one day from your leak and figure out what would happen in a month (30 days) or in a year (365 days)?

Aquarion Water Company, now serves 211,000 homes and businesses, or approximately 677,000 people, in 53 communities in Connecticut, New York, Massachusetts and New Hampshire.

How much water would be wasted if each of the 6,000 consumers (less than 1% of the total) had the same leak as the one you recorded?

EX: 25 milliliters lost in one minute for each of the 6,000 consumers would result in a total of 20,531,000 gallons of water wasted because of leaks each year.