

Making Decisions: Water Use Analysis Sheet

Data is often analyzed by finding the statistical mean, median, mode, and range. The terms mean, median and mode are used to describe the central tendency of a large data set. Range provides context for the mean, median and mode.

When working with a large data set, it can be useful to represent the entire data set with a single value that describes the "middle" or "average" value of the entire set. In statistics, that single value is called the central tendency and mean, median and mode are all ways to describe it. To find the mean, add up the values in the data set and then divide by the number of values that you added. To find the median, list the values of the data set in numerical order and identify which value appears in the middle of the list. To find the mode, identify which value in the data set occurs most often. Range, which is the difference between the largest and smallest value in the data set, describes how well the central tendency represents the data. If the range is large, the central tendency is not as representative of the data as it would be if the range was small.

If your data set is small these are easy to hand calculate. However, for big data sets computer analysis becomes necessary. Excel and Google Sheets provide easy ways to find these values. We will analyze our water use class data to find these values of central tendency.

Use the data you collected for your three-day **Water Use Tracking Log** to complete the following analysis of your household's water use. You will then use this information to answer questions about your household's water use and that of your classmates.

| Water Usage | Data Table Totals | Conversion Factor | Total Water Used |
|--|-------------------|---|------------------|
| Number of baths | | × 130 L/bath | L |
| Number of showers × average duration of a shower (in minutes) Regular shower head Water-efficient shower head | min(s) | × 19 L L/min (regular) × 9 L/min (water efficient) | L |

Name: _____ Date: _____ Class: _____

| | | | |
|--|--------|--|---|
| Number of toilet flushes regular toilet water-saving toilet low-flow toilet | | × 19 L/flush (regular) × 13 L/flush (water saving) × 6 L/flush (low-flow) | L |
| Number of hand-washed loads of dishes | | × 114 L/load (with water running) × 19 L/load (washing and rinsing in dishpans) | L |
| Number of machine-washed loads of dishes | | × 61 L/load (full cycle) × 26 L/load (short cycle) | L |
| Numbers of washing-machine loads of laundry | | × 170 L/load | L |
| Number of lawn or garden water rings × Average duration of a watering (in minutes) | min(s) | × 18.8 L/min | L |
| Number of car washes | | × 680 L/wash | L |
| Number of cups of water (estimated) for cooking and drinking | | × .2 L/cup | L |
| Number of cups of water (estimated) for watering plants or watering/bathing pets | | × .2 L/cup | L |
| Number of times water runs in sink × Average duration of water running (in minutes) | min(s) | × 19 L/min (regular) × 26 L/min (water efficient) | L |
| Total water used in three days | | | L |

1. Calculate the total water volume (in liters) used by your household during the three days. (last item in table above)

_____ L total water volume used in household

2. How much water (in liters) did one member of your household use, on average, in one day?

Name: _____ Date: _____ Class: _____

Total water/3 = water use of household in 1 day.

Water use of household in 1 day/number of people in house = 1 day use of 1 member.

_____ L average/person/day

3. Compile the answers to Question 2 for all members of your class. To do this – go into the Google survey link below and enter your data. Then go into the other link to get survey results.

Use the [Google survey](#) example linked here to post your water use totals for the histogram. [Link to survey results](#) here.

4. Once the class data is in the survey, make a copy of the Google sheet (and share it with the teacher) and create a histogram, copy the histogram here.

Use google sheets to calculate the following:

In Google Sheets find the average (mean), max value, min value, range, median, and mode

Commands for cells in sheets:

average =AVERAGE(B2:B61)

maximum value =MAX(B2:B61)

minimum value =MIN(B2:B61)

median =Median(B2:B61)

to find range =round(max(B2:B61),1)-round(min(B2:B61),1)

mode =mode(B2:B61)

5. What is the range within your class?

Name: _____ Date: _____ Class: _____

6. Calculate the mean, median, and mode values for the class data.

Class mean:

Class median:

Class mode:

7. Compare your answer to Question 2 with the estimated average volume of water used daily by each person in the United States—that estimate is 370 gallons per day. Why would your value be different than the national average?

8. Which is closer to the national, your answer to Question 2 or the class average in Question 6? Why would that be?

9. On the basis of the water-use data collected and analyzed by your class explain how you would estimate the total volume of water that would need to be hauled to our town for three days if our water supply was cut off.

10. What other information could you gather that would help you improve your estimate in Question 9? Why?

11. What assumptions did you make to complete your estimate?

12. If water was in limited supply what activity could you not do without?

Name: _____ Date: _____ Class: _____

13. How could you reduce your water use?

14. Impurities added by using water for one particular use may not prevent its reuse for other purposes. For example, you might decide to save dish water and use it later to water your plants. What are some activities where you could use impure water?