

Range

by Sophia



WHAT'S COVERED

This lesson discusses calculating the range of data. You will be able to determine the range of the data set. This lesson covers:

1. [Variability in Data](#)
2. [Range](#)

1. Variability in Data

In addition to finding the center of a data set, such as the mode or median, statistics is also interested in finding a number that tells you how far the data set is spread out from the center. By determining how spread out the data set is, you are establishing a measure of what is known as variability. Two ways to measure variability are the range of a data set and the interquartile range of a data set.

With either of these measures, understanding the variability in data can help determine if the findings of the two tests are comparable. Tests may come from within the same study or may be from studies conducted at different places or at different times. By comparing the variability of different tests or studies, you can add reliability to those tests or studies. When there is less variability between data across the test or studies, these tests may be considered more valid.

If you recall from the eight steps of the experimental method, Step 7 asks to revise the guess if the prediction is wrong and return to Step 2. If the prediction looks right, you need to start testing again from Step 4 to verify the results.



THINK ABOUT IT

Why would you want to keep testing?

As you continue testing, you help assure a minimal degree of variability in the test, which in turn helps validate the results of the test that you're conducting.

2. Range

Finding the **range** of a data set means finding the smallest value, known as the minimum, and the largest value, which is known as the maximum. The range is simply the difference between the maximum and the minimum values. The range is a measure of variability or spread, meaning that the larger the range, the more spread out the values in the data set are.



FORMULA TO KNOW

Range

Maximum Value - Minimum Value



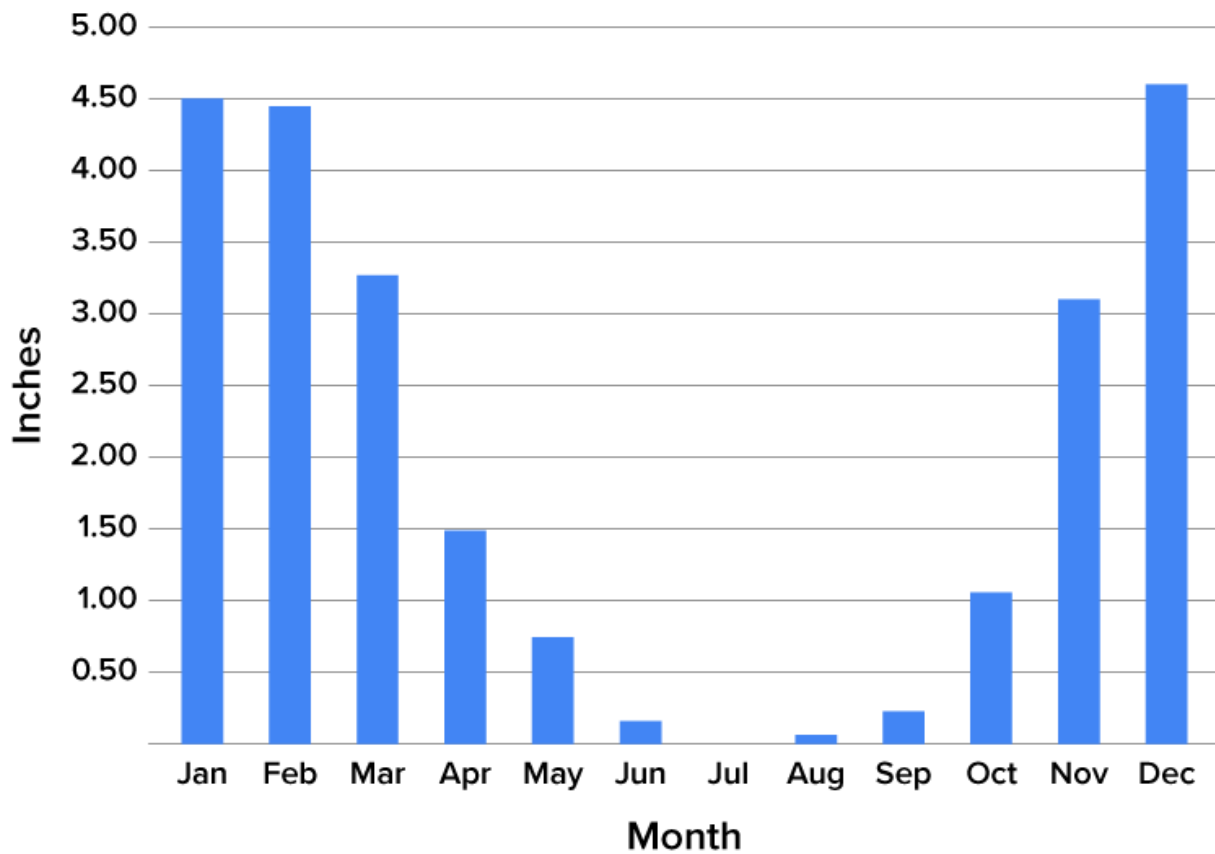
HINT

Keep in mind that if the data set has extreme values, the range may not accurately represent the spread of the data. We'll learn about how the interquartile range addresses this problem in the next lesson.

Say you're dealing with the incomes of people, a situation in which there's going to be a very large range. The data set could include a very low income, maybe a few thousand dollars a year, and could also include a very high income, potentially tens of millions of dollars per year. This is an extreme range. It's not going to give you a good sense of how well those incomes are distributed.

Take a look at this graph of the average monthly rainfall in San Francisco:

Rainfall



THINK ABOUT IT

How do you figure out the range of this particular data set?

Arrange the numbers from smallest to largest. July has the least amount of average rainfall with 0 inches. In December, they received 4.57 inches. Take the difference, which is 4.57, and that is your range.



TERM TO KNOW

Range

The difference between the maximum and minimum values.



SUMMARY

In this lesson, you looked at what **variability in data** can mean and its importance. You also learned how to determine the **range** of a data set.



TERMS TO KNOW

Range

The difference between the maximum and minimum values.



FORMULAS TO KNOW

Range

Maximum Value - Minimum Value