

Data Management

Mean, Median, Mode, and Range

Calculating the Mean (average):

To calculate the mean of a data set, we must include all values.

The mean (or average) is determined by taking the sum of all the numbers and dividing it by the amount of numbers.

Formula:
$$\frac{\text{sum of data}}{\text{amount of data}}$$

*Sum = the result of adding up all numbers.

Example:

Calculation of the mean for the following data set:

10, 15, 8, 11, 9, 18, 20

$$\text{Mean} = \frac{10 + 15 + 8 + 11 + 9 + 18 + 20}{7}$$

$$= \frac{91}{7}$$

$$= \mathbf{13}$$

Calculating the Median (middle value):

Before calculating the median, the data must be placed in ascending order (from least to greatest).

Ex.: 8, 9, 10, 11, 15, 18, 20

If there is an odd amount of numbers in the data set (7 numbers in this case):

The median is the number in the middle, and is therefore **11**.

What if there is an *even* amount of numbers?

In this case, there will be 2 numbers in the middle. We must then find the average of those two numbers to determine the median.

Ex.: 8, 9, 10, 11, 15, 18

Notice that both 10 and 11 are in the middle of the data set. The median must now be calculated by finding the average of those two numbers:

$$\frac{10 + 11}{2}$$

$$= \frac{21}{2}$$

Median = 10.5

Determining the Mode:

The mode of a data set is the value/response that appeared the most.

- a) Only one mode: 8, 9, 10, 11, 11, 15, 18 **mode = 11**

- b) More than one mode: 8, 8, 9, 10, 11, 11, 15, 18 **mode = 8 and 11**

- c) No mode: 8, 9, 10, 11, 15, 18 **no mode**

* If there is no mode, those words must be used. We can't say that the mode is zero, because that would mean that zero appeared the most.

Calculating the Range:

The range is the difference between the highest and lowest numbers in a data set.

Ex.: 8, 9, 10, 11, 15, 18

$$\text{Range} = 18 - 8$$

$$= \mathbf{10}$$