1.6: Standard Deviation

The standard deviation from the mean is the most commonly used measure for spread. Sometimes it is called the variance.

Qualitative Description: **typical** distance from the mean

Points Scored over the first 10 basketball games

Mean =

Range =

Purdue Boilermakers

Indiana Hoosiers

How do their standard deviations compare?

Consider these quiz scores (quiz is out of 10 points):

9, 8, 9, 8, 7, 6, 9, 10, 8, 9, 9, 10

What is a typical distance from the mean (the standard deviation)?

Data Points	Distance from Mean

Population vs. Sample

If we can collect data from an entire population, we report the population mean and population standard deviation.

Most often we can only get a sample set of data from the entire population and then we report the sample mean and sample standard deviation.

	Sample	Population
Mean		
Standard Deviation		

Officially, the formal formula for calculating standard deviation is below. However, we will not use this definition for now. You'll need it next year if you take AP Statistics.

$$s = \sqrt{\frac{1}{N-1}\sum_{i=1}^{N}(x_i - \overline{x})^2}$$

$$\sigma = \sqrt{\frac{1}{N}\sum_{i=1}^{N}(x_i - \mu)^2}$$

Open the Fathom File called

"Estimate mean and stddev"

In this fathom file you can change the mean and standard deviation and see how it changes the histogram and box plot. Spend a few minutes changing the mean and standard deviation, observing how the change affects the histogram and box plot. Remember, the more variability the higher standard deviation. Fill in the chart below with your observations.

	Small Mean	Large Mean	Small Standard Deviation	Large Standard Deviation
Histogram				
Box Plot				

Work with a partner to create the following data sets in fathom:

1. A data set of 14 numbers that contains a mean of 8 with a standard deviation of 3

2. A data set of 8 numbers that has a mean of 85 with a standard deviation of 1.5

3. A data set of 10 numbers that has a mean of 15 with a standard deviation of 9