

## Demo: Calculating the Sample Size for a Confidence Interval

In this video, you learn how to use the Sample Size for Confidence Intervals calculator to compute the sample size required to create a confidence interval with a specified margin of error.

This calculator is available from the Help menu in JMP, under Sample Data and then Calculators.

You can use the calculator to evaluate the sample size for a confidence interval for a proportion or a mean. We'll click OK to calculate the sample size for a confidence interval for a mean.

For this scenario, suppose that we're planning to collect data to estimate the mean breaking strength of a part, measured in ksi (kilopounds per square inch). The desired margin of error for the interval estimate is 10 ksi.

To compute the sample size, you need to input three values. The first is the desired confidence level. We'll construct a 95% confidence interval, so we'll enter 0.95 in the first field.

We use a planning value for the population standard deviation. This is a reasonable estimate of the standard deviation, which is guided by past data and subject matter knowledge. For this scenario, let's say that the estimated standard deviation is 20

ksi. In the last field, we specify the desired margin of error, or the halfwidth of the confidence interval. We enter 10 into this field, and press the Tab or Enter key to accept this value.

The resulting value is 15.3658, which we round up to 16.

What does this mean? In order to achieve a margin of error of 10 ksi for our 95% confidence interval, given the assumed standard deviation and confidence level, we need to measure the breaking strength of 16 parts.

What if the required margin of error is 5 instead of 10? The calculated value is now 61.4633, or 62.

To cut the margin of error in half, we need to quadruple the sample size.

What if we use the current values but want to compute a 99% confidence interval instead of a 95% interval? For these same values, the sample size jumps to 107. For a higher confidence level, you need a larger sample size.

Let's take a look at one more field. What would happen to the sample size if the population were actually less variable? For the current values, if we decrease the standard deviation from 20 ksi to 10, the sample size drops to 27.

For a less variable population, you need a smaller sample size to achieve a specified margin of error at the given confidence level.

Close