



## M5-06: Confidence Intervals for Means

Part of the "Polling, Confidence Intervals, and the Normal Distribution" Learning Badge

Video Walkthrough: <https://discovery.cs.illinois.edu/m5-06/>

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### Confidence Intervals for Means

Sometimes we want to look at surveys that ask questions with numerical answers, like: "How many hours did you sleep last night?", "How much money did you make last year?", or "How much do you weigh?"

In these surveys, the relevant statistic is the average, so now we're interested in the EV and SE of the sample average.

Basically, we're doing exactly what we did previously, except we are dealing with the sample average instead of the sample percent. The population mean ( $\mu$ ) is unknown, however, we do know the sample mean ( $\bar{X}$ ).

### Inference for Means Visual:

**Puzzle #1: Money!** Thinking of your own situation, how much money per year would you need to make in order to consider yourself rich. A random sample of 1,572 adults nationwide was taken and their average was \$150,000 and the sample SD was \$158,600.

**a)** Estimate the average amount of money that all American adults would need to make to consider themselves rich.

**b)** Calculate the standard error of the sample average.

**c)** What is an 85% confidence interval for the average amount of money all American adults would need to consider themselves rich?

**d)** Would a 95% confidence interval be wider or narrower than the 85% confidence interval?