



Think of the true value of an item's length, caloric content, distance, weight, etc. as the average of a very large number of possible measurement values that form a normal distribution centered at the true value. When we take multiple measurements of the item, we are observing values from this distribution.

- 1) A suspicious looking substance found in the back of 140 SH is weighed 80 times. The average weight is 762 grams with $SD = 56$ grams. Find a 95% confidence interval for the true weight of the substance.

Find a 90% (also 99%) confidence interval for the true weight of the object.

- 2) A rangefinder is used to measure the distance between an observer and a bridge. In 32 measurements, the average observed reading is 488 meters, with $SD = 12$ meters. Find a 95% confidence interval for the true distance between the observer and the bridge.

What if only 5 measurements were made but the SD is **KNOWN** to be 10 meters

- 3) In 48 measurements, a cubic meter of air is found to contain 2556 particles of a pollutant, on average, with $SD = 192$. Find a 98% confidence interval for the true particle count in this sample of air.