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1. For a standard, normally distributed population the mean does not affect the width of confidence intervals. The mean only changes where the standard distribution curve is centered around but not the width of the curve.
2. The standard deviation would affect confidence intervals because they are both related to the variance of our data.
3. Sample size does affect the confidence intervals because this is the amount of data you select. With larger sample sizes, more variation is introduced to the model and if the sample size becomes large enough it could start to represent the population size.
4. Population size affects confidence intervals because the sample size does. They both describe the variation due to experimental design and as more variation is introduced with larger sample sizes, the variance and therefore confidence intervals will change.
5. I work with microplastics (MPs) in wastewater treatment so for my work confidence intervals would describe the number of MPs I expect to find 95% of the time, continuing with the 95% range. For instance, we can assume the confidence interval number of MPs in wastewater is between 500-2000 particles per liter, at 95%. This does not mean that 95% of my samples contained 500-2000 particles; it means that when I repeat my measurements, I expect this range to remain constant 95% of the time. This indicates the mean and most samples will fall within this range 95% of the time when the measurements are repeated. This shows a large amount of variability in my data whereas a smaller confidence interval indicates less variation because we are confident that the MP count is more consistent.