

Name: _____ Hour: _____ Date: _____

How much does an Oreo weigh?



Mrs. Gallas wanted to estimate the average weight of an Oreo cookie to determine if the average weight was less than advertised. She selected a random sample of 30 cookies and found the weight of each cookie (in grams). The mean weight was $\bar{x} = 11.1921$ grams with a standard deviation of $s_x = 0.0817$ grams. Make a 95% confidence interval to estimate the true mean weight of an Oreo.

1. What is the **point estimate** for the true mean? _____
2. Identify the population, parameter, sample and statistic.
Population: _____ Parameter: _____
Sample: _____ Statistic: _____
3. Was the sample a random sample? Why is this important?
4. What is the formula for calculating the standard deviation of the sampling distribution of \bar{x} ?
5. What condition must be met to use this formula? Has it been met?
6. In the formula for standard deviation of the sampling distribution of \bar{x} , we don't know the value of σ (if we did, we would have known μ) so we will use s_x instead. Find the **standard error**.
7. Would it be appropriate to use a normal distribution to model the sampling distribution of \bar{x} ? Justify your answer.
8. When finding the margin of error for a confidence interval for a proportion we use z^* . For a mean we will use _____ as the critical value. Why???

Name: _____ Hour: _____ Date: _____

9. What t^* is needed for this confidence interval? Use **Table B** and the **degrees of freedom (df) = n - 1** to find it.

10. Calculate the **margin of error** using t^* and the standard error.

11. Calculate the 95% confidence interval using **point estimate +/- margin of error**.

12. Interpret the interval.

13. Write a specific formula for a confidence interval for a population mean.

14. According to Nabisco, an Oreo weighs 11.3 grams. Does our confidence interval provide convincing evidence that the true average weight is less than 11.3 grams? Explain.

Name: _____ Hour: _____ Date: _____

Estimating a Population Mean Day 1

Important ideas:

Check Your Understanding

- Use Table B to find the critical value t^* that you would use for a confidence interval for a population mean μ in each of the following settings. If possible, check your answer with technology.
 - A 98% confidence interval based on a random sample of 26 observations
 - A 99% confidence interval from an SRS of 85 observations
- A national poll of a random sample of 1,640 adults was carried out by Morning Consult. Each person reported how much they (or their significant other) spent on an engagement ring. The histogram displays the results. Determine if the conditions for constructing a confidence interval for a mean have been met in this context.

