

Chapter 10 FRAPPY!

Sample # 1

Directions: Show all your work. Indicate clearly the methods you use, because you will be scored on the correctness of your methods as well as on the accuracy and completeness of your results and explanations.

Jessica wondered if elementary school students tend to write more when they are given a larger amount of space in which to write. To investigate, she asked 100 fourth and fifth grade students to respond to the following prompt: "Do you like recess? Why or why not?" About half of the students were randomly assigned to use a larger 1/4-sheet of paper to write their response and the remaining students were assigned a smaller 1/6-sheet of paper. After the students finished, Jessica counted the number of words in each response. Summary statistics for each group are shown in the table.

Group	Number	Mean	Standard Deviation
Larger sheet	46	18.3	8.5
Smaller sheet	54	16.9	7.9

(a) Calculate and interpret a 95% confidence interval for the difference in mean number of words written for students like these who are asked to respond to the prompt on either a 1/4-sheet of paper or a 1/6-sheet of paper.

State: 95% CI for $\mu_L - \mu_S$ where μ_L = true mean number of words that kids like these write when given a larger sheet and μ_S = ... a smaller sheet.

Plan: 2 sample t interval Random? Treatments randomly assigned ✓
 Normal/Large Sample? $54 > 30$, $46 > 30$
 so both pops are approx Normal ✓

Do: $18.3 - 16.9 \pm t^* \sqrt{\frac{8.5^2}{46} + \frac{7.9^2}{54}}$

$\rightarrow -1.88 \text{ to } 4.68 \quad df = 92.9$

conclude: Jessica is 95% confident that the interval from -1.88 to 4.68 captures the true difference in mean number of words written for students like these who are asked to respond to the

(b) Based only on the confidence interval from part (a), is there convincing evidence that the size of the paper affects the mean number of words written for students like these?

prompt on either a 1/4 sheet or a 1/6 paper.

No, because 0 is in the interval.

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Sample #2

Directions: Show all your work. Indicate clearly the methods you use, because you will be scored on the correctness of your methods as well as on the accuracy and completeness of your results and explanations.

Jessica wondered if elementary school students tend to write more when they are given a larger amount of space in which to write. To investigate, she asked 100 fourth and fifth grade students to respond to the following prompt: "Do you like recess? Why or why not?" About half of the students were randomly assigned to use a larger 1/4-sheet of paper to write their response and the remaining students were assigned a smaller 1/6-sheet of paper. After the students finished, Jessica counted the number of words in each response. Summary statistics for each group are shown in the table.

Group	Number	Mean	Standard Deviation
Larger sheet	46	18.3	8.5
Smaller sheet	54	16.9	7.9

(a) Calculate and interpret a 95% confidence interval for the difference in mean number of words written for students like these who are asked to respond to the prompt on either a 1/4-sheet of paper or a 1/6-sheet of paper.

TwoSampTInt

Random ✓

Normal ✓

CI = -1.88 to 4.68

I am 95% confident that the interval from -1.88 to 4.68 captures the difference in the number of words written.

(b) Based only on the confidence interval from part (a), is there convincing evidence that the size of the paper affects the mean number of words written for students like these?

Because 0 is in the interval, there is convincing evidence that the size of the paper doesn't affect the mean number of words written for students like these.