

Inference with Census at School Data - Write up to turn in Friday, May 6th. Use other sheets of paper.

Census at School is an international classroom project that engages students in grades 4–12 in statistical problem solving¹. Students complete a 40-question online survey, analyze their class census results, and compare their class with random samples of students in the United States and other countries. The following questions use an SRS of 100 responses from U.S. students and 200 international students in grades 11-12 in 2017.

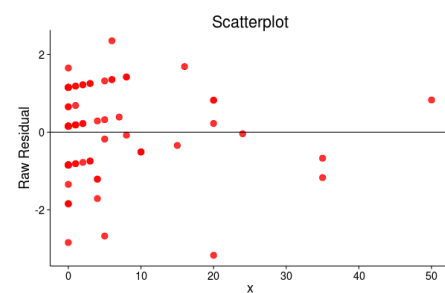
Complete your work on separate sheets of paper. Show all your work. Indicate clearly the methods you use, because you will be scored on the correctness of your methods as well as on the accuracy and completeness of your results and explanations. For all confidence intervals, use a 90% confidence level and explain what the confidence level means in the context of the problem. For all hypothesis tests, use an $\alpha = 0.05$ and explain what the p-value means in the context of the problem. You may work with someone else, but each person must turn in all 6 procedures.

1. Use convincing statistical evidence: Are students getting an average of less than 7 hours of sleep on school nights? The average for 87 U.S. students who responded was 6.69 hrs with a standard deviation of 1.16 hrs.
2. Use convincing statistical evidence: “Which of these methods do you most often use to communicate with your friends?” 42 of 88 U.S. teens chose text messaging as their choice. Do less than six-tenths of U.S. high school students text as the primary method of communication with their friends?
3. Use convincing statistical evidence: When asked “Which superpower would you choose?” 21 of the 87 U.S. teens who responded indicated that flying was their favorite. Estimate the proportion of U.S. high school students who favor flying.
4. Use convincing statistical evidence: Is there an association between country and method of transportation to school? Of 38 US residents, 26 drove to school; of 40 New Zealanders, 20 drove to school. (2 possible tests)
5. Use convincing statistical evidence: Estimate the difference in reaction time for British and Canadian students: 39 Canadians had an average reaction time of 0.4735 sec with a SD of 0.164 sec, 36 Brits had an average of 0.393 sec with a SD of 0.119 sec.
6. Use convincing statistical evidence: Characterize the relationship between the number of hours students spend sleeping on non-school nights and the number of hours spent playing video games?

Coefficients:

	Estimate	Std. Error	t value	Pr(> t)
(Intercept)	8.27	0.24	34.67	0.00
Videoplay	0.04	0.02	1.61	0.11

Residual standard error: 0.21
Multiple R-squared: 0.03



¹ U.S. Census at School info and data hosted by the ASA: <https://www.amstat.org/censusatschool/>

<http://www.ltconline.net/greenL/java/statistics/catstatprob/categorizingstatproblemsjavascript.html>