SRS vs. Convenience Sample in the Gettysburg Address

Written by: Jim Spiker and Trey Cox

Arizona Mathematics Partnership

[James.spiker@cgc.edu](mailto:James.spiker@cgc.edu)

# Student Handout

The Gettysburg Address is a famous oratory delivered by Abraham Lincoln. What is the readability of this document? Researchers often rate the readability of a document by finding the average word length of the passage. Since this document has over 250 words in it we will take a random sample of words and take the average of that sample to use it as an estimator of the mean of the entire passage.

***Lincoln’s Gettysburg Address***

1. Directions-Circle 5 words from the Gettysburg Address at random. Count the number of letters in each word and compute the mean number of letters per word. Put this value on the post-it note provided and then place this post-it note on the board to create a histogram.

*Four score and seven years ago our fathers brought forth upon this continent, a new nation, conceived in Liberty, and dedicated to the proposition that all men are created equal. Now we are engaged in a great civil war, testing whether that nation, or any nation so conceived and so dedicated, can long endure. We are met on a great battlefield of that war. We have come to dedicate a portion of that field, as a final resting place for those who here gave their lives that that nation might live. It is altogether fitting and proper that we should do this. But, in a larger sense, we cannot dedicate we cannot consecrate we cannot hallow this ground. The brave men, living and dead, who struggled here, have consecrated it, far above our poor power to add or detract. The world will little note, nor long remember what we say here, but it can never forget what they did here. It is for us the living, rather, to be dedicated here to the unfinished work which they who fought here have thus far so nobly advanced. It is rather for us to be here dedicated to the great task remaining before us that from these honored dead we take increased devotion to that cause for which they gave the last full measure of devotion that we here highly resolve that these dead shall not have died in vain that this nation, under God, shall have a new birth of freedom and that government of the people, by the people, for the people, shall not perish from the earth.*

1. Use the calculator to pick 5 random numbers from 1 to 268 by typing math-prb-randint(1,268,5) or use a random number table. Find the words associated with these numbers in the table attached and compute the average word length as you did in part 1. Write this value on the post-it note provided and put it on the histogram on the board.



1. Write a few sentences that compare and contrast the two dot plots. How are they alike and how are they different?
2. Now repeat the process of using the calculator but this time create a random sample of size 10 by typing math-prb-randint(1,268,10) or use a random number table. Find the average word length as you have before and make a new histogram on the board. What do you notice about the variation in the distribution? Has it increased or decreased? Why do you think that happened?
3. For each dot plot combine all of the classroom data into a list. Use each list to compute the mean, median, and MAD of each distribution. How are these values alike? How are they different? What do they each tell us?