



# Why Random Sampling?

## Student Activity

Name \_\_\_\_\_

Class \_\_\_\_\_

In these activities you will use random samples to find the sample mean of a population. After completing the activities, discuss and/or present your findings to the rest of the class.



### Activity 1 [Page 3.2]

1. A *random sample* of a certain size is a sample in which every set in the population of that size has the same chance of being selected. On page 3.2, **1 Repetition** will generate random samples of 5 segments.
  - a. Select **1 Repetition** and describe the random sample of segments.
  
  
  
  
  
  
  
  
  
  
  - b. Select **10 Repetitions**. Highlight one of the points in the dot plot. Explain what that point represents.
  
  
  
  
  
  
  
  
  
  
  - c. Describe the dot plot and explain what it represents.
  
2. Select **10 Repetitions**, look at the dot plot and select another 10 repetitions.
  - a. Continue until you have about 100 samples. Describe how the dot plot changed as the number of samples increased from 10 to 100.
  
  
  
  
  
  
  
  
  
  
  - b. Based on the distribution of sample mean lengths you generated, make a conjecture about what you think the mean length of all of the segments will be. Explain your reasoning.
  
  
  
  
  
  
  
  
  
  
  - c. Select **Show Line**. How close was your conjecture and how does it fit into the distribution of the sample means?



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- d. Select **50 Repetitions** until you have a distribution of 500 sample mean lengths. How does the distribution change?
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3. Reset and generate another distribution of sample mean lengths. How does this distribution of sample means compare to the distribution from 2d?



### Activity 2 [Page 3.4]

1. a. Which, if any, of the three estimation methods—educated guess, judgment sample, or random sample—do you think is more likely to give a sample that is most representative of the population? Why?
  
  - b. Reset page 3.2. Generate a distribution of 30 sample means based on 30 random samples. Return to page 3.4. The means calculated from the judgment samples you made as a class are graphed on the bottom axis. The top axis shows the distribution of the 30 mean lengths from the random samples you generated on page 3.2. How do the distributions compare?
  
  - c. Which sampling method seems to give results that are more representative of the population? Explain your reasoning.
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2. Sandra claimed that the mean of a random sample seems to be a good estimator for a population mean. Do you agree or disagree with Sandra? Use the TNS activity to support your reasoning.

