

Core Content

Cluster Title: Use random sampling to draw inferences about a population.
Standard 1: Understand that statistics can be used to gain information about a population by examining a sample of the population; generalizations about a population from a sample are valid only if the sample is representative of that population. Understand that random sampling tends to produce representative samples and support valid inferences.
Concepts and Skills to Master
<ul style="list-style-type: none"> Understand that representative samples can be used to make valid inferences about a population. Understand that a random sample increases the likelihood of obtaining a representative sample of a population.

Supports for Teachers

Critical Background Knowledge	
<ul style="list-style-type: none"> None 	
Academic Vocabulary	
<ul style="list-style-type: none"> Inference, sample, random sample, population 	
Suggested Instructional Strategies	Resources
<ul style="list-style-type: none"> Given a population, have students analyze various sample groups as being representative or not. Discuss means of obtaining a random sample. Use a random number generator to create a random sample. 	Random Number Generator (ex. Calculator, Websites, Excel/Number)
Sample Formative Assessment Tasks	
Skill-based Task Find three examples in the media that demonstrate the use of samples to make a statement about the population.	Problem Task Design a method of gathering a random sample from the student body to determine the favorite NFL team.

Core Content

Cluster Title: Use random sampling to draw inferences about a population.
Standard 2: Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. Generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions. <i>For example, estimate the mean word length in a book by randomly sampling words from the book; predict the winner of a school election based on randomly sampled survey data. Gauge how far off the estimate or prediction might be.</i>
Concepts and Skills to Master
<ul style="list-style-type: none"> • Make inferences about a population based on a sample. • Explore the variation in estimates or predictions based on multiple samples of the same data.

Supports for Teachers

Critical Background Knowledge	
<ul style="list-style-type: none"> • Summarize quantitative data using quantitative measures of center and variability.(6.SP.5) • How to obtain a random sample. 	
Academic Vocabulary	
Variation, inference, prediction, sampling error	
Suggested Instructional Strategies	Resources
<ul style="list-style-type: none"> • Obtain multiple samples of the same size for a given population and explore variability and differences in estimates of measures of central tendency. 	
Sample Formative Assessment Tasks	
<p>Skill-based Task Students asked 10 of their peers their favorite music. The results are show below. Student 1: 4 Pop, 6 Country, Student 2: 1 Pop, 9 Country, Student 3: 6 Pop, 4 Country. What would student 1 say about the proportion of students who prefer Pop? If, in fact, 75% of the student body prefers Pop, what is the error in each student’s estimate?</p>	<p>Problem Task Given the first name of all students in your grade. Predict the most common name in the U.S. for 7th graders. How good an estimate do you think your sample provides? Explain your reasoning.</p>

Core Content

Cluster Title: Draw informal comparative inferences about two populations.
Standard 3: Informally assess the degree of visual overlap of two numerical data distributions with similar variabilities, measuring the difference between the centers by expressing it as a multiple of a measure of variability. <i>For example, the mean height of players on the basketball team is 10 cm greater than the mean height of players on the soccer team, about twice the variability (mean absolute deviation) on either team; on a dot plot, the separation between the two distributions of heights is noticeable.</i>
Concepts and Skills to Master
<ul style="list-style-type: none"> The measure of mean is independent of the measure of variability. Use visual representations to compare and contrast numerical data from two populations using measures of variability and center.

Supports for Teachers

Critical Background Knowledge	
<ul style="list-style-type: none"> Number Line Graphs including dot plots, histograms, and box plots. Calculate the measures of center (median and/or mean) and the measures of variability (interquartile range and/or mean absolute deviation) 	
Academic Vocabulary	
Variability	
Suggested Instructional Strategies	Resources
<ul style="list-style-type: none"> Use measures of center and spread to compare temperatures in Honolulu, HI and Los Angeles, CA, observing visual overlap in a dot plot. 	
Sample Formative Assessment Tasks	
Skill-based Task The average temperature in City 1 is 70 degrees and in City 2 it is 80 degrees. The mean absolute deviation of City 1 is 5 degrees and in City 2 it is 5 degrees. Compare the data using measures of center and spread.	Problem Task Measure the heights of the girls versus boys in your class. Calculate the measures of center and measures of variability for each group. Describe the similarities and differences.

Core Content

Cluster Title: Draw Informal comparative inferences about two populations.
Standard 4: Use measures of center and measures of variability for numerical data from random samples to draw informal comparative inferences about two populations. <i>For example, decide whether the words in a chapter of a seventh-grade science book are generally longer than the words in a chapter of a fourth-grade science book.</i>
Concepts and Skills to Master
<ul style="list-style-type: none"> • Make comparative inferences about two populations using measures of center and variability.

Supports for Teachers

Critical Background Knowledge	
<ul style="list-style-type: none"> • Measures of Center (median and/or mean) • Measures of Variability (interquartile range and/or mean absolute deviation) 	
Academic Vocabulary	
Inference	
Suggested Instructional Strategies	Resources
<ul style="list-style-type: none"> • In small groups, compare and contrast similar data from two populations to make inferences. 	
Sample Formative Assessment Tasks	
<p>Skill-based Task Measure the heights of the girls versus boys in your class. Calculate the measures of center and measures of variability for each group. What inferences can you make about the height of girls versus boys? Will these inferences be the same your Senior year? Support your answer with a description of the overlap of the two distributions and numerical calculations for means and variability.</p>	<p>Problem Task Decide whether girls or boys take longer to get ready for school in the morning. Justify your answer using measures of center and spread.</p>