AP Statistics Unit 8: Sampling Distributions

Unit #:	APSDO-00019160	Duration:	1.5 Week(s)	Date(s):	

Team:
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Grades:
11, 12
Subjects:
Mathematics

Unit Focus

In this unit, students will use sampling distributions as a basis for inferential statistics. By studying the distributions of sample statistic, students will learn about the corresponding population parameter. In addition, students will expand their knowledge of sampling distributions by evaluating biases that occur in data collection. Summative assessments may include projects, labs, and tests. Primary instructional materials include The Practice of Statistics 1st Edition, by D. Yates, D. Moore, and G. McGabe, 1999., videos from Against All Odds collection hosted by Teresa Amabile, and past AP exam free response questions presented as classwork prompts.

Stage 1: Desired Results - Key Understandings

Established Goals

Common Core
Mathematics: 11

- Use the mean and standard deviation of a data set to fit it to a normal distribution and to estimate population percentages. Recognize that there are data sets for which such a procedure is not appropriate. Use calculators, spreadsheets, and tables to estimate areas under the normal curve. *CCSS.MATH.CONTENT.HSS.ID.A.4*
- Look for and make use of structure. *CCSS.MATH.MP.7*
- Reason abstractly and quantitatively.

Transfer

T1 (T50) Based on an understanding of any problem, initiate a plan, execute it and evaluate the reasonableness of the solution.
T2 (T53) Articulate how mathematical concepts relate to one another in the context of a problem or in the theoretical sense.
T3 (T51) Examine alternate methods to accurately and efficiently solve problems.
T4 (T52) Use appropriate tools strategically to deepen understanding of mathematical concepts.
T5 (T31) Represent, summarize, and interpret data to clarify and solve problems or to make informed decisions.

Meaning

Understandings	Essential Questions
U1 (U510) Every problem is a member of a	**Q1** (Q511) What characteristics/attributes

CCSS.MATH.MP.2	category of problems that has a similar structure and set of characteristics. **U2** (U511) Placing a problem in a category gives you a familiar approach to solving it. **U3** (U560) Patterns and structures are characterized by consistent relationships. **U4** (U311) Predictions of an event may require consideration of multiple data sets on which the target is dependent. **U5** (U309) Data sets may be causally related to or independent of one another. **U6** (U307) A data set is summarized by its properties (e.g.,central tendency, variability).	define this type of problem? **Q2** (Q512) What information is needed and how do I use it to solve a problem? **Q3** (Q561) How does understanding the pattern/structure help me solve the problem? **Q4** (Q560) What is the pattern/structure in this problem? **Q5** (Q305) What measurements are appropriate to describe the properties of the data set? **Q6** (Q304) What patterns do I see in this data set? Could this be random behavior? (Gr 6-12) **Q7** (Q300) What properties of the object am I trying to measure? How do I measure them?
	Acquisition of Knowledge and Skill	
	Knowledge	**Skills**
		S1 Determine the variability and bias of a statistic **S2** Use raw data to construct a relative frequency distribution for sample mean values **S3** Compare results of a relative frequency distribution to a theoretical sampling distribution **S4** Use terms appropriately such as random sample, relative frequency, parameter, statistic, and sampling distribution **S5**

		Use mean and standard deviation of a normal distribution to construct a theoretical sampling distribution for the sample mean **S6** Use sample estimates of large samples to construct a good approximate sampling distribution for the sample mean **S7** Use and understand the central limit theorem **S8** Compute the mean and standard deviation for the sample proportion **S9** Use normal approximations to compute probabilities for proportions

Stage 3: Learning Plan

Coding	Code	Description of Learning Activity