

FOLSOM CORDOVA UNIFIED SCHOOL DISTRICT



AP Statistics

Board Approval Date: May 20, 2021	Course Length: 2 Semesters
Grading: A-F	Credits: 5 Credits per Semester
Proposed Grade Level(s): 11, 12	Subject Area: Mathematics Elective Area (if applicable): N/A
Prerequisite(s): "C" or better in Mathematics III	Corequisite(s): N/A
CTE Sector/Pathway: N/A	
Intent to Pursue 'A-G' College Prep Status: Yes	
A-G Course Identifier: (c) Mathematics	
Graduation Requirement: Yes	
Course Intent: District Course Program (if applicable): N/A	
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COURSE DESCRIPTION: (Online Course)

AP Statistics gives students hands-on experience collecting, analyzing, graphing, and interpreting real-world data. They will learn to effectively design and analyze research studies by reviewing and evaluating real research examples taken from daily life. The next time they hear the results of a poll or study, they will know whether the results are valid. As the art of drawing conclusions from imperfect data and the science of real-world uncertainties, statistics plays an important role in many fields. The equivalent of an introductory college-level course, AP Statistics prepares students for the AP exam and for further study in science, sociology, medicine, engineering, political science, geography, and business. This course has been authorized by the College Board to use the AP designation.

DETAILED UNITS OF INSTRUCTION:

Unit Number/Title	Unit Essential Questions	Examples of Formative Assessments	Examples of Summative Assessment
1. Describing Data	<p>What is the history of statistics?</p> <p>What are the main types of statistics and types of data used?</p> <p>What are and how do you create different kinds of frequency plots, including histograms, relative frequency plots, cumulative frequency plots, stem-and-leaf plots, box-and-whisker plots, cumulative relative frequency plots, and bar graphs?</p> <p>What is the distinction between a population and a sample, and between a parameter and a statistic?</p> <p>How do you calculate the three measures of center (the mean, the median, and the mode) and standard deviation?</p>	<p>*Errors in Ads (and Other Claims)</p> <p>*Practice: Identifying Types of Data and Statistics</p> <p>*Practice: What Can You Tell from Graphs?</p> <p>*Practice: Populations and Samples, Parameters and Statistics</p>	<p>*Choosing Appropriate Graphs</p> <p>*Five-Number Summaries on MINIT AB</p> <p>*Unit Test</p>
2. The Normal Distribution	<p>Why is the normal distribution essential to the study of statistics?</p> <p>How does the normal distribution apply to the real world?</p> <p>How do you check for normalcy using either the empirical rule or a normal quantile plot?</p>	<p>*Practice: Properties of Normal Distributions</p> <p>*Practice: Raw and Standardized Scores</p> <p>*Practice: Checking a Data Set for Normalcy</p>	<p>*Using a Normal Curve Table</p> <p>*Unit Test</p>
3. Bivariate Data	<p>What is association?</p> <p>What is correlation?</p> <p>How are they connected?</p> <p>Does association imply causation?</p> <p>How can modeling data</p>	<p>*Practice: Least-Squares Regression Line</p> <p>*Practice: Residuals</p> <p>*Practice: Pearson: Correlation Coefficient</p> <p>*Practice: The Meaning of</p>	<p>*Linear Regression Lines</p> <p>*Relation of Shoe Size to Height</p> <p>*Correlation vs. Causation</p> <p>*Unit Test</p>

	<p>help us to understand patterns?</p> <p>When is it appropriate to use extrapolation to predict the future?</p> <p>What are outliers and influential points?</p>	<p>r-Squared</p> <p>*Practice: How to Read MINIT AB Output</p> <p>*Practice: Transformations to Achieve Linearity</p>	
4. Planning a Study	<p>How do we obtain data?</p> <p>Why is it important?</p> <p>How can bias be identified and prevented?</p> <p>To what extent does data collection methodology affect results?</p>	<p>*Practice: Choosing the Design of an Experiment</p> <p>*Practice: Bias in Surveys/Transition to Inference</p>	*Unit Test
5. Probability	<p>How can we base decisions on chance?</p> <p>How can probability be used to simulate events and to predict future happenings?</p> <p>What are the benefits of simulating events as opposed to gathering real data?</p> <p>What are random variables, discrete variables, tree diagrams, two-way tables and how are they used in probability?</p> <p>How can modeling predict the future?</p>	<p>*Practice: Concepts of Probability</p> <p>*Practice: Random Variables: Discrete and Continuous</p> <p>*Practice: Mean and Variances of Random Variables</p>	<p>*Using the Rules of Probability</p> <p>*Games and Real-World Problems</p> <p>*Unit Test</p>
6. Binomials and Distribution	<p>To what extent does our world exhibit binomial and geometric phenomena?</p> <p>How do sampling distributions relate to population distributions?</p> <p>What is a normal distribution?</p> <p>How does the normal distribution apply to the real world?</p>	<p>*Practice: Binomial Situations (Events)</p> <p>*Practice: Geometric Probability Distributions</p> <p>*Practice: Sampling Distributions and the Central Limit Theorem</p> <p>*Practice: Sampling Distribution of p-Hat</p>	<p>*Binomial Problems Using Two Methods</p> <p>*Unit Test</p>
7. Introduction to Inference	<p>What is inference? How can decisions be based on</p>	<p>*Practice: Using Sample Means to Estimate Population</p>	*Working With P-Values and Statistical

	<p>chance?</p> <p>To what extent should decisions be based on chance?</p> <p>How can we determine the mean of a population with a “small” sample?</p> <p>When are tests of significance and confidence intervals used? How can one prepare for errors from significance tests?</p>	<p>Means</p> <p>*Practice: The Hypothesis-Testing Procedure</p> <p>*Practice: Two-Sided Significance Tests and Confidence Intervals</p> <p>*Practice: The Power of the Test, Type I and Type II Errors</p>	<p>Significance</p> <p>*Computing Probabilities for Type I and Type II Errors</p> <p>*Unit Test</p>
8. T Distribution for Means	<p>What do you do when you do not know the population standard deviation?</p> <p>How do you use t tables?</p> <p>When should and should not data be analyzed as a matched-pairs situation?</p> <p>How do you create 90%, 95%, and 99% confidence t intervals for mean differences?</p>	<p>*Practice: Hypothesis Testing With the t Distribution</p> <p>*Practice: Inference for Matched-Pairs Situations</p>	<p>*Hypothesis Test for the Difference of Two Independent Samples</p> <p>*Unit Test</p>
9. Inference for Proportions	<p>How can we determine the mean of a population with a “small” sample?</p> <p>To what extent are significance tests reliable?</p> <p>How can we determine the proportion of a population with a “small” sample?</p> <p>To what extent are significance tests reliable?</p> <p>How do you test for a difference between two proportions?</p>	<p>*Practice: Confidence Interval for a Single Population Proportion</p> <p>*Practice: Significance Tests for One and Two Proportions</p>	<p>*One- and Two-Tailed Significance Tests for a Single Population Proportion</p> <p>*Unit Test</p>
10. Inference for Tables and Least-Squares	<p>How can we verify that two variables are independent?</p> <p>How do you find critical values for a chi-square test?</p> <p>How do you estimate the least-square line for a population?</p>	<p>*Practice: Chi-Square for Goodness-of-Fit</p> <p>*Practice: Chi-Square Hypothesis Tests for Association or Independence</p>	<p>*Unit Test</p>

ESSENTIAL STANDARDS:

Interpreting Categorical and Quantitative Data

Summarize, represent, and interpret data on a single count or measurement variable.

S-ID 3: Interpret differences in shape, center and spread in the context of the data, accounting for possible effects of outliers.

S-ID 4: Use the mean and standard deviation of a data set to fit it to a normal distribution and estimate percentages.

S-ID 5: Summarize categorical data for two categories in two-way frequency tables. Interpret relative frequencies in the context of data. Recognize possible associations and trends in the data.

S-ID 8: Compute using technology and interpret a linear regression model and correlation.

S-ID 9: Distinguish between correlation and causation.

Making Inferences and Justifying Conclusions

Understand and evaluate random processes underlying statistical experiments.

S-IC 1: Understand statistics is a process for making inferences about population parameters based on a random sample from that population.

Make inferences and justify conclusions from sample surveys, experiments, and observational studies.

S-IC 3: Recognize the purposes of and differences among sample surveys, experiments, and observational studies; explain how randomization relates to each.

S-IC6: Evaluate reports based on data.

Conditional Probability and the Rules of Probability

Understand independence and conditional probability and use them to interpret data.

S-CP-5: Recognize and explain the concepts of conditional probability and independence in everyday language and everyday situations.

Use the Rules of probability to compute probabilities of compound events in a uniform probability model.

S-CP-7: Apply the addition rule and interpret the answer in the terms of the model.

S-CP-8: Apply the general multiplication rule and interpret the answer in the terms of the model.

S-CP-9: Use permutation and combinations to compute probabilities of compound events and solve problems.

Using Probability to Make Decisions

Use probability to evaluate outcomes of decisions.

S-MD-7: Analyze decisions and strategies using probability concepts.

RELEVANT STANDARDS AND FRAMEWORKS. CONTENT/PROGRAM SPECIFIC STANDARDS:

Link to Common Core Standards (if applicable):

Educational standards describe what students should know and be able to do in each subject in each grade. In California, the State Board of Education decides on the standards for all students, from kindergarten through high school.

<https://www.cde.ca.gov/be/st/ss/documents/ccssmathstandarAug2013.pdf>

Link to Framework (if applicable):

Curriculum frameworks provide guidance for implementing the content standards adopted by the State Board of Education (SBE). Frameworks are developed by the Instructional Quality Commission, formerly known as the Curriculum Development and Supplemental Materials Commission, which also reviews and recommends textbooks and other instructional materials to be adopted by the SBE.

<https://www.cde.ca.gov/ci/ma/cf/documents/mathapprobandstat.pdf>

Link to Subject Area Content Standards (if applicable):

Content standards were designed to encourage the highest achievement of every student, by defining the knowledge, concepts, and skills that students should acquire at each grade level.

<https://apcentral.collegeboard.org/pdf/ap-statistics-course-and-exam-description.pdf>

Link to Program Content Area Standards (if applicable):

Program Content Area Standards applies to programs such as International Baccalaureate, Advanced Placement, Career and Technical Education, etc.

TEXTBOOKS AND RESOURCE MATERIALS:

Textbooks

Board Approved	Pilot Completion Date (If applicable)	Textbook Title	Author(s)	Publisher	Edition	Date
Yes		APEX: AP Statistics		APEX Online Courses		2019

Other Resource Materials

N/A

Supplemental Materials

Board approved supplemental materials (Including but not limited to: Film Clips, Digital Resources, Supplemental texts, DVDs, Programs (Pebble Creek, DBQ, etc.):

N/A