Math: Advanced Placement Statistics

UNIT/Weeks (not consecutive)	Timeline/Topics	Essential Questions
9	**Statistical Inference** • Estimating Point Estimators • Estimating Confidence Intervals • Testing Significance	• How much evidence do you need before you are able to make a reasonable conjecture? • Is it reasonable to think that different people require different amounts of convincing? • How is statistical inference used to draw conclusions from data? • How is probability used to express the strength of our conclusions? • What is inference? • To what extent should decisions be made based on chance? • To what extent are significance tests reliable? • How can one prepare for errors from significance tests? • Is all data “created equal”? • What makes an argument statistically convincing? • What is significant about significance? • What does it mean to be 95% confident? • How do you determine if there is a statistical significance? • What does it mean to make an inference? • What is a confidence interval? • How can we verify that two variables are independent? • How does one distinguish among the various tests of significance? • How can decisions be based on chance? • How do we make a declaration of independence statistically? • Is independence desirable? • How can we test a series of proportions? • How can we test the slope of a correlation? • How do we use a model to make statistical inference? •
9	**Sampling and Experimentation** • Differentiating Between Methods of Data Collection • Planning and Conducting Surveys • Planning and Conducting Experiments	• What is an experiment? • What is bias? • How can it be identified? • How can it be prevented? • To what extent is data biased? • To what extent can data be purposely biased? • Does size matter? • Is all data “created equal”?

	• Generalizing Results and Making Conclusions	
9	**Exploring Data** • Constructing and Interpreting Graphical Displays • Summarizing Distributions • Comparing Distributions • Exploring Bivariate Data • Exploring Categorical Data	• How do we communicate and understand data? • What is data? • Can you lie with statistics? How and to what extent? • How can data analysis be used to predict future happenings? • Does the data always lead to the truth? • Is all data "created equal"? • How does one assess normality? • Why is the normal distribution essential to the study of statistics? • How does the normal distribution apply to the real world? • How do density curves relate to probability? • What does it mean to regress? • What is association? What is correlation? How are they connected? • Does association imply causation? • How can modeling data help us to understand patterns? • Can we use extrapolation to predict the future? • Is it possible to test for lack of correlation?
9	**Anticipating Patterns** • Determining Probabilities • Combining Independent Random Variables • Using the Normal Distribution • Interpreting Sampling Distributions	• What is the probability of understanding probability? • How can we base decisions on chance? • How can probability be used to simulate events and to predict future happenings? • What are the benefits of simulating events as opposed to gathering real data? • Is independence desirable? • What is randomness? • How can modeling predict the future? • To what extent does our world exhibit binomial and geometric phenomena? • When is probability a sure thing?

		• How can we base decisions on chance? • Is anything in nature truly random? • How does the normal distribution apply to the real world? • Does the Central Limit Theorem test one's limit? • Is all data "created equal"?