

Title AP Statistics

<b>Unit:</b>		<b>Exploring One-Variable Data</b>					
<b>Big Ideas*:</b>		1 & 2					
<b>Unit Essential Questions:</b>		Is my cat old, compared to other cats? How certain are we that what seems to be a pattern is not just a coincidence?					
<b>Concept &amp; Pacing</b>	<b>Pa Core Standard</b>	<b>Key Vocabulary</b>	<b>Essential Questions</b>	<b>Competencies (skills, knowledge, abilities)</b>	<b>Mini-Lessons/Activities</b>	<b>Instructional Materials</b>	<b>Assessments</b>
<b>Introducing Statistics: What Can We Learn from Data? - 1 day</b>	CC.2.4.HS.B.1	Statistics Individual	How can numbers convey meaningful information, when placed in context?	Identify the question to be answered or problem to be solved .		Textbook - Introduction	Ticket-out Homework
<b>The Language of Variation: Variables - with previous</b>	CC.2.4.HS.B.1	Variable Categorical variable Qualitative variable Distribution	What is a variable? How do categorical and qualitative variables vary?	Identify variables in a set of data. Classify types of variables.		Textbook - Introduction Project	Ticket-out Homework
<b>Representing a Categorical Variable with Tables - 2 days</b>	CC.2.4.HS.B.1	Frequency table Relative frequency table Conditional relative frequency	How can categorical data be organized and described?	Represent categorical data using frequency or relative frequency tables Describe categorical data represented in frequency or relative tables.		Textbook - Section 1.1	Ticket-out Homework
<b>Representing a Categorical Variable with Graphs - 2 days</b>	CC.2.4.HS.B.1	Bar graph Pie chart Side-by-side bar graphs Segmented bar graphs Association Mosaic plots	How can categorical data be represented graphically?	Represent categorical data graphically. Describe categorical data represented graphically. Compare multiple sets of categorical data.		Textbook - Section 1.1	Ticket-out Homework
<b>Representing a Quantitative Variable with Graphs - 1 day</b>	CC.2.4.HS.B.1	Dotplot Symmetric Skewed Stemplot Histogram	What are the different types of quantitative data? How can quantitative data be represented graphically?	Classify types of quantitative variables. Represent quantitative data graphically	Gallery walk FRQ Partner Quiz	Textbook - Section 1.2	Ticket-out Homework
<b>Describing the Distribution of a Quantitative Variable - 1 day</b>	CC.2.4.HS.B.1		How can data distributions be described?	Describe the characteristics of quantitative data distributions.		Textbook - Section 1.2	Ticket-out Homework
<b>Summary Statistics for a</b>	CC.2.4.HS.B.1	Mean Median Range	How can data sets be summarized by	Calculate measures of center and position for quantitative data. Calculate measures of variability for	FRQ Partner Quiz	Textbook - Section 1.3	Ticket-out Homework

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Title AP Statistics

<b>Quantitative Variable - 1 day</b>		Standard deviation Quartiles Interquartile range Outlier	center, position, and variability?	quantitative data.			
<b>Graphical Representations of Summary Statistics - 1 day</b>	CC.2.4.HS.B.1	Five Number Summary Boxplot	How can summary statistics be represented graphically?	Represent summary statistics for quantitative data graphically. Describe summary statistics of quantitative data represented graphically.	Notice and Wonder	Textbook - Section 1.3	Ticket-out Homework
<b>Comparing Distributions of a Quantitative Variable - 1 day</b>	CC.2.4.HS.B.1		How can data sets be compared?	Compare graphical representations for multiple sets of quantitative data. Compare summary statistics for multiple sets of quantitative data	Reversing interpretations	Textbook - Section 1.2	Ticket-out Homework
<b>Review and Assessment - 2 days</b>						Textbook Chapter 1 Test	Assessment
<b>The Normal Distribution - 5 days</b>	CC.2.4.HS.B.1	Percentile Cumulative relative frequency graph Standardized score (z-score) Density curves Mean of a density curve Median of a density curve Normal curve Normal distribution Standard normal distribution Normal probability plot	How do we know if a data set is approximately normal?	Compare a data distribution to the normal distribution model. Determine proportions and percentiles from a normal distribution Compare measures of relative position in data sets.		Textbook - Section 2.1 and 2.2	Ticket-out Homework
<b>Review and Assessment - 2 days</b>						Textbook Chapter 2 Test	Assessment

Unit total = 19 days

Cumulative total = 19 days

Title AP Statistics

<b>Unit:</b>		<b>Exploring Two-Variable Data</b>					
<b>Big Ideas*:</b>		1, 2, & 3					
<b>Unit Essential Questions:</b>		Does the fact that the number of shark attacks increases with ice cream sales necessarily mean that ice cream sales cause shark attacks? How might you represent incomes of individuals with and without a college degree to help describe similarities and/or differences between the two groups? How can you determine the effectiveness of a linear model that uses the number of cricket chirps per minute to predict temperature?					
<b>Concept &amp; Pacing</b>	<b>Pa Core Standard</b>	<b>Key Vocabulary</b>	<b>Essential Questions</b>	<b>Competencies (skills, knowledge, abilities)</b>	<b>Mini-Lessons/Activities</b>	<b>Instructional Materials</b>	<b>Assessments</b>
<b>Introducing Statistics: Are Variables Related? - previously covered</b>	CC.2.4.HS.B.2			Identify questions to be answered about possible relationships in data.		Textbook - Section 1.5	Ticket-out Homework
<b>Representing Two Categorical Variables - previously covered</b>	CC.2.4.HS.B.2		How can categorical data be compared?	Compare numerical and graphical representations for two categorical variables.		Textbook - Section 1.1 and 1.5	Ticket-out Homework
<b>Statistics for Two Categorical Variables - previously covered</b>	CC.2.4.HS.B.2		What statistics can be used to represent categorical data and how can they be compared?	Calculate statistics for two categorical variables. Compare statistics for two categorical variables.		Textbook - Section 1.2	Ticket-out Homework
<b>Representing the Relationship between Two Quantitative Variables - 2 days</b>	CC.2.4.HS.B.2	Response variable Explanatory variable Scatterplot Positive association Negative association No association	What does a scatterplot indicate about bivariate data?	Represent bivariate quantitative data using scatterplots. Describe the characteristics of a scatter plot.		Textbook - Section 3.1	Ticket-out Homework
<b>Correlation - 1 day</b>	CC.2.4.HS.B.3	Correlation	How does the correlation relate to the linear strength of a scatterplot?	Determine the correlation for a linear relationship. Interpret the correlation for a linear relationship.	Quickwrite	Textbook - Section 3.1	Ticket-out Homework
<b>Linear Regression Models - 1 day</b>	CC.2.4.HS.B.3	Regression line Extrapolation	How can a linear regression model be used to predict response values?	Calculate a predicted response value using a linear regression model.		Textbook - Section 3.2	Ticket-out Homework

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Title AP Statistics

<b>Residuals - 2 day</b>	CC.2.4.HS.B.3	Residual Residual plot Standard deviation of residuals Coefficient of determination	What do residual plots show in regards to the relationship between measured and predicted responses?	Represent differences between measured and predicted responses using residual plots. Describe the form of association of bivariate data using residual plots.	Reversing interpretations	Textbook - Section 3.2	Ticket-out Homework
<b>Least Squares Regression - 1 day</b>	CC.2.4.HS.B.3	y-intercept slope Least-squares regression line	What do the values in a linear regression model represent?	Estimate parameters for the least-squares regression line model. Interpret coefficients for the least-squares regression line model.	Quickwrite Build the model situation	Textbook - Section 3.2	Ticket-out Homework
<b>Analyzing Departures from Linearity - 1 day &amp; 2 days</b>	CC.2.4.HS.B.3		What effect do influential points have on a regression model.	Identify influential points in regression. Calculate a predicted response using a least squares regression line for a transformed data set.	Predict & Confirm	Textbook - Section 3.2 and Section 12.2	Ticket-out Homework
<b>Review and assessment - 2 days</b>	CC.2.4.HS.B.2 CC.2.4.HS.B.3			All of above		Textbook Chapter 3 Test	Assessment

Unit total = 9 days

Cumulative total = 28 days

Title AP Statistics

<b>Unit:</b>		<b>Collecting Data</b>					
<b>Big Ideas*:</b>		1 & 3					
<b>Unit Essential Questions:</b>		What do our data tell us? Why might the data we collected not be valid for drawing conclusions about an entire population?					
<b>Concept &amp; Pacing</b>	<b>Pa Core Standard</b>	<b>Key Vocabulary</b>	<b>Essential Questions</b>	<b>Competencies (skills, knowledge, abilities)</b>	<b>Mini-Lessons/Activities</b>	<b>Instructional Materials</b>	<b>Assessments</b>
<b>Introducing Statistics: Do the Data we Collected Tell the Truth? - with later concepts</b>	CC.2.4.HS.B.4			Identify questions to be answered about data collection methods.		Textbook - Section 4.1	Ticket-out Homework
<b>Introduction to Planning a Study - 1 day</b>	CC.2.4.HS.B.4	Population Census Sample Sample survey Observational study Experiment	What is the difference between an experiment and an observational study?	Identify the type of a study. Identify appropriate generalizations and determinations based on observational studies.	Graphic Organizer Odd one out Password-Style Games	Textbook - Section 4.2	Ticket-out Homework
<b>Random Sampling and Data Collection - 2 days</b>	CC.2.4.HS.B.4	Convenience sampling Random sampling Simple random sample Strata Stratified random sampling Clusters Cluster sampling	How can we recognize the best sampling method to use for the intended study?	Identify a sampling method, given a description of a study. Explain why a particular sampling method is or is not appropriate for a given situation.	Password-Style Games	Textbook - Section 4.1	Ticket-out Homework
<b>Potential Problems with Sampling - 1 day</b>	CC.2.4.HS.B.4	Bias Voluntary response sampling Undercoverage Nonresponse Response bias	What bias might exist in sampling techniques?	Identify potential sources of bias in sampling methods.		Textbook - Section 4.1	Ticket-out Homework
<b>Introduction to Experimental Design - 2 days</b>	CC.2.4.HS.B.4	Response variable Explanatory variable Confounding Double-blind Single-blind	How is a successful experiment carried out?	Identify the components of an experiment. Describe elements of a well-designed experiment. Compare experimental designs and methods.	Sentence Starters Think-Pair-Share	Textbook - Section 4.2	Ticket-out Homework

\*See key at the end

Title AP Statistics

		Random assignment Control Replication					
<b>Selecting an Experimental Design - 1 day</b>	CC.2.4.HS.B.4	Placebo Treatment Experimental unit Subjects Factor Levels Control group Placebo effect Completely randomized design Block Randomized block design Matched pairs design	How do we recognize appropriate experiments?	Explain why a particular experimental design is appropriate.		Textbook - Section 4.2	Ticket-out Homework
<b>Inference and Experiments - 1 day</b>	CC.2.4.HS.B.4	Sampling variability Statistically significant	What do the results of an experiment mean?	Interpret the results of a well-designed experiment.		Textbook - Section 4.3	Ticket-out Homework
<b>Review and assessment - 2 days</b>	CC.2.4.HS.B.4					Textbook Chapter 4 Test	

Unit total =10 days

Cumulative total = 38 days

Title AP Statistics

<b>Unit:</b>		<b>Probability, Random Variables, and Probability Distributions</b>					
<b>Big Ideas*:</b>		1 & 2					
<b>Unit Essential Questions:</b>		How can an event be both random and predictable? About how many rolls of a fair six-sided die would we anticipate it taking to get three 1s?					
<b>Concept &amp; Pacing</b>	<b>Pa Core Standard</b>	<b>Key Vocabulary</b>	<b>Essential Questions</b>	<b>Competencies (skills, knowledge, abilities)</b>	<b>Mini-Lessons/Activities</b>	<b>Instructional Materials</b>	<b>Assessments</b>
<b>Introducing Statistics: Random and Nonrandom Patterns? - with next</b>	CC.2.4.HS.B.6	Probability		Identify questions suggested by patterns in data.			Ticket-out Homework
<b>Estimating Probabilities Using Simulations - 3 days</b>	CC.2.4.HS.B.6	Law of large numbers Simulation	How can simulations be used to estimate probabilities?	Estimate probabilities using simulation. Calculate probabilities for events and their complements. Interpret probabilities for events	Predict and confirm	Textbook - Section 5.1	Ticket-out Homework
<b>Mutually Exclusive Events - 1 day</b>	CC.2.4.HS.B.6	Mutually exclusive	What makes two events mutually exclusive?	Explain why two events are (or are not) mutually exclusive.	Error analysis Think-pair-share	Textbook - Section 5.2	Ticket-out Homework
<b>Conditional Probability - 2 days</b>	CC.2.4.HS.B.6	Conditional probability Independent events General multiplication rule Tree diagram	What are conditional probabilities and how are they calculated?	Calculate conditional probabilities.		Textbook - Section 5.3	Ticket-out Homework
<b>Independent Events and Union of Events - 2 days</b>	CC.2.4.HS.B.6	Probability model Sample space Event Complement rule General addition rule Venn diagrams Intersection Unions	What makes events independent and what effect does that have on the probability of both?	Calculate probabilities for independent events and for the union of two events	Error analysis Think-pair-share Create representations	Textbook - Section 5.2	Ticket-out Homework

\*See key at the end

Title AP Statistics

<b>Review and assessment - 2 days</b>	CC.2.4.HS.B.6				Think-pair-share Create representations	Textbook Chapter 5 Test	Assessment
<b>Introduction to Random Variables and Probability Distributions - 1 day</b>	CC.2.4.HS.B.7	Random variable Probability distribution Discrete random variable Continuous random variable	What is a discrete random variable and how can it be represented?	Represent the probability distribution for a discrete random variable. Interpret a probability distribution.		Textbook - Section 6.1	Ticket-out Homework
<b>Mean and Standard Deviation of Random Variables - 1 day</b>	CC.2.4.HS.B.7		What values are used to represent a discrete random variable?	Calculate parameters for a discrete random variable. Interpret parameters for a discrete random variable.	Error analysis	Textbook - Section 6.1	Ticket-out Homework
<b>Combining Random Variables - 2 days</b>	CC.2.4.HS.B.7	Independent random variables	What effects do linear transformations have on random variables?	Calculate parameters for linear combinations of random variables. Describe the effects of linear transformations of parameters of random variables.		Textbook - Section 6.2	Ticket-out Homework
<b>Introduction to the Binomial Distribution - 1 day</b>	CC.2.4.HS.B.7	Binomial setting Binomial random variable Binomial distribution	How can probabilities be calculated using a binomial distribution?	Estimate probabilities of binomial random variables using data from a simulation Calculate probabilities for a binomial distribution.	Odd one out	Textbook - Section 6.3	Ticket-out Homework
<b>Parameters for a Binomial Distribution - 1 day</b>	CC.2.4.HS.B.7	Binomial coefficient 10% condition Large counts condition	What parameters represent a binomial distribution?	Calculate parameters for a binomial distribution. Interpret probabilities and parameters for a binomial distribution.		Textbook - Section 6.3	Ticket-out Homework
<b>The Geometric Distribution - 1 days</b>	CC.2.4.HS.B.7	Geometric setting Geometric random variable Geometric distribution	How can probabilities be calculated using a geometric distribution and what parameters represent the distribution?	Calculate probabilities for geometric random variables. Calculate parameters of a geometric distribution. Interpret probabilities and parameters for a geometric distribution.	Odd one out Predict and Confirm	Textbook - Section 6.3	Ticket-out Homework

Title AP Statistics

<b>Review and Assessment - 2 days</b>	CC.2.4.HS.B.7					Textbook Chapter 6 Test	Assessment
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Unit total = 19 days

Cumulative total = 57 days

Title AP Statistics

<b>Unit:</b>		<b>Sampling Distributions</b>					
<b>Big Ideas*:</b>		1 & 2					
<b>Unit Essential Questions:</b>		How likely is it to get a value this large just by chance? How can we anticipate patterns in the values of a statistic from one sample to another?					
Concept & Pacing	Pa Core Standard	Key Vocabulary	Essential Questions	Competencies (skills, knowledge, abilities)	Mini-Lessons/Activities	Instructional Materials	Assessments
<b>Introducing Statistics: Why is my sample not like yours? - 1 day</b>	CC.2.4.HS.B.7	Statistics Parameter Sampling variability Sampling distribution		Identify questions suggested by variation in statistics for samples collected from the same population.		Textbook - Section 7.1	Ticket-out Homework
<b>The Normal Distribution, Revisited - with others</b>	CC.2.4.HS.B.7		How can the normal distribution be used to determine probabilities?	Calculate the probability that a particular value lies in a given interval of a normal distribution Determine the interval associated with a given area in a normal distribution. Determine the appropriateness of using the normal distribution to approximate probabilities for unknown distributions.	Think aloud	Textbook - Section 7.2 and 7.3	Ticket-out Homework
<b>The Central Limit Theorem - 1 day</b>	CC.2.4.HS.B.7	Central Limit Theorem	How can simulations be used to estimate sampling distributions?	Estimate sampling distributions using simulation	Use manipulatives	Textbook - Section 7.3	Ticket-out Homework
<b>Biased and Unbiased Estimates - 1 day</b>	CC.2.4.HS.B.7	Unbiased estimator	What makes an estimator unbiased?	Explain why an estimator is or is not unbiased Calculate estimates for a population parameter.		Textbook - Section 7.1	Ticket-out Homework
<b>Sampling Distributions for Sample Proportions - 2 days</b>	CC.2.4.HS.B.7	Sampling distribution of the sample proportion	How can probabilities and parameters be used with sampling proportions?	Determine parameters of a sampling distribution for sample proportions. Determine whether a sampling distribution for a sample proportion can be described as approximately normal. Interpret probabilities and parameters for a sampling distribution for a sample proportion.	Password style game	Textbook - Section 7.2	Ticket-out Homework
<b>Sampling Distributions for Differences in Sample Proportions - with later</b>	CC.2.4.HS.B.7		How can probabilities and parameters be used with the difference in sampling proportions?	Determine parameters of a sampling distribution for a difference in sample proportions. Determine whether a sampling distribution for a difference of sample		Textbook - Section 10.1	Ticket-out Homework

\*See key at the end

Title AP Statistics

				proportions can be described as approximately normal. Interpret probabilities and parameters for a sampling distribution for a difference in proportions.			
<b>Sampling Distributions for Sampling Means - 2 days</b>	CC.2.4.HS.B.7	Sampling distribution of the sample mean	How can probabilities and parameters be used with sampling means?	Determine parameters for a sampling distribution for sample means Determine whether a sampling distribution of a sample mean can be described as approximately normal. Interpret probabilities and parameters for a sampling distribution for a sample mean	Password style game	Textbook - Section 7.3	Ticket-out Homework
<b>Sampling Distributions for Differences in Sample Means - with later</b>	CC.2.4.HS.B.7		How can probabilities and parameters be used with the difference in sampling means?	Determine parameters of a sampling distribution for a difference in sample means. Determine whether a sampling distribution of a difference in sample means can be described as approximately normal. Interpret probabilities and parameters for a sampling distribution for a difference in sample means.		Textbook - Section 10.2	Ticket-out Homework
<b>Review and assessment - 2 days</b>	CC.2.4.HS.B.7					Textbook Chapter 7 test	Assessment

Unit total = 9 days

Cumulative total = 66 days

Title AP Statistics

<b>Unit:</b>	<b>Inference for Categorical Data: Proportions</b>						
<b>Big Ideas*:</b>	1, 2, & 3						
<b>Unit Essential Questions:</b>	When can we use a normal distribution to perform inference calculations involving population proportions? How can we narrow the width of a confidence interval? If the proportion of subjects who experience serious side effects when taking a new drug is smaller than the proportion of subjects who experience serious side effects when taking a placebo, how can we determine if the difference is statistically significant?						
Concept & Pacing	Pa Core Standard	Key Vocabulary	Essential Questions	Competencies (skills, knowledge, abilities)	Mini-Lessons/Activities	Instructional Materials	Assessments
<b>Introducing Statistics: Why be Normal? - with next</b>				Identify questions suggested by variation in the shapes of distributions of samples taken from the same population.			Ticket-out Homework
<b>Constructing a Confidence Interval for a Population Proportion - 3 days</b>	CC.2.4.HS.B.5	Point estimator Point estimate Confidence interval Confidence level Margin of error Critical value	How are confidence intervals calculated?	Identify an appropriate confidence interval procedure for a population proportion. Verify the conditions for calculating confidence intervals for a population proportion. Determine the margin of error for a given sample size and an estimate for the sample size that will result in a given margin of error for a population proportion. Calculate an appropriate confidence interval for a population proportion. Calculate an interval estimate based on a confidence interval for a population proportion.	The Scribe and the Calculator	Textbook - Section 8.1	Ticket-out Homework
<b>Justifying a Claim Based on a Confidence Interval for a Population Proportion - 3 days</b>	CC.2.4.HS.B.5	Standard error	What do confidence intervals tell us about a population proportion?	Interpret a confidence interval for a population proportion. Justify a claim based on a confidence interval for a population proportion. Identify the relationships between sample size, width of a confidence interval, confidence level, and margin of error for a population proportion.		Textbook - Section 8.2	Ticket-out Homework
<b>Setting Up a Test for a Population Proportion - 4 days</b>	CC.2.4.HS.B.5	Null hypothesis Alternative hypothesis One-sided hypothesis Two-sided hypothesis Standardized Test Statistic	How are hypotheses written for a test about a population proportion?	Identify the null and alternative hypotheses for a population proportion. Identify an appropriate testing method for a population proportion. Verify the conditions for making statistical inferences when testing a population proportion.	Error analysis	Textbook- Section 9.1 and 9.2	Ticket-out Homework

\*See key at the end

Title AP Statistics

<b>Interpreting p-Values – 1 day</b>	CC.2.4.HS.B.5	p-value Significance level	What does the p-value tell us in regards to an observed statistic and the hypothesized parameter?	Calculate an appropriate test statistic and p-value for a population proportion. Interpret the p-value of a significance test for a population proportion.	Sentence starters	Textbook - Section 9.1	Ticket-out Homework
<b>Concluding a Test for a Population Proportion - with previous</b>	CC.2.4.HS.B.5		How can the results of a hypothesis test be used to justify a claim about the population?	Justify a claim about the population based on the results of a significance test for a population proportion.	Sentence starters	Textbook - Section 9.2	Ticket-out Homework
<b>Potential Errors When Performing Tests - 1 day</b>	CC.2.4.HS.B.5	Type I Error Type II Error	What are Type I and Type II errors?	Identify Type I and Type II errors. Calculate the probability of a Type I and Type II errors. Identify factors that affect the probability of errors in significance testing. Interpret Type I and Type II errors.	Error analysis	Textbook - Section 9.1	Ticket-out Homework
<b>Confidence Intervals for the Difference of Two Proportions - 1 day</b>	CC.2.4.HS.B.5		How is a confidence interval for the difference of two proportions calculated?	Identify an appropriate confidence interval procedure for a comparison of population proportions. Verify the conditions for calculating confidence intervals for a difference between population proportions. Calculate an appropriate confidence interval for a comparison of population proportions. Calculate an interval estimate based on a confidence interval for a difference of proportions.	Error analysis The Scribe and the Calculator	Textbook - Section 10.1	Ticket-out Homework
<b>Justifying a Claim Based on a Confidence Interval for a Difference of Population Proportions - 1 day</b>	CC.2.4.HS.B.5		What does a confidence interval tell us about a difference in two proportions?	Interpret a confidence interval for a difference of proportions Justify a claim based on a confidence interval for a difference of proportions.		Textbook - Section 10.1	Ticket-out Homework
<b>Setting Up a Test for the Difference of Two Population Proportion - 1 day</b>	CC.2.4.HS.B.5		How are hypotheses written for a test for the difference of two proportions?	Identify the null and alternative hypotheses for a difference of two population proportions. Identify an appropriate testing method for the difference of two population proportions. Verify the conditions for making statistical inferences when testing a difference of two population proportions.		Textbook - Section 10.1	Ticket-out Homework

Title AP Statistics

<p><b>Carrying Out a Test for the Difference of Two Population Proportions - 1 day</b></p>	<p>CC.2.4.HS.B.5</p>		<p>What does the p-value tell us in regards to an observed difference and the hypothesized difference?</p>	<p>Calculate an appropriate test statistic for the difference of two population proportions. Interpret the p-value of a significance test for a difference of population proportions. Justify a claim about the population based on the results of a significance test for a difference of population proportions.</p>	<p>Sentence starters</p>	<p>Textbook - Section 10.1</p>	<p>Ticket-out Homework</p>
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Unit total = 16 days

Cumulative total = 82 days

Title AP Statistics

<b>Unit:</b>		<b>Inference for Quantitative Data: Means</b>					
<b>Big Ideas*:</b>		1, 2, & 3					
<b>Unit Essential Questions:</b>		How do we know whether to use a t-test or a z-test for inference with means? How can we make sure that samples are independent? Why is it inappropriate to accept a hypothesis as true based on the results of statistical inference testing?					
Concept & Pacing	Pa Core Standard	Key Vocabulary	Essential Questions	Competencies (skills, knowledge, abilities)	Mini-Lessons/Activities	Instructional Materials	Assessments
<b>Introducing Statistics: Why Should I Worry About Error? - with next</b>	CC.2.4.HS.B.5			Identify questions suggested by probabilities of errors in statistical inference			Ticket-out Homework
<b>Constructing a Confidence Interval for a Population Mean - 2 days</b>	CC.2.4.HS.B.5		How are confidence intervals for means calculated?	Describe t-distributions. Identify an appropriate confidence interval procedure for a population mean, including the mean difference between values in matched pairs Verify the conditions for calculating confidence intervals for a population mean, including the mean difference between values in matched pairs. Determine the margin of error for a given sample size for a one-sample t-interval. Calculate an appropriate confidence interval for a population mean, including the mean difference between values in matched pairs.	Predict and Confirm Team Challenge	Textbook - Section 8.3	Ticket-out Homework
<b>Justifying a Claim About a Population Mean Based on a Confidence Interval - 2 days</b>	CC.2.4.HS.B.5		What do confidence intervals tell us about a population mean?	Interpret a confidence interval for a population mean, including the mean difference between values in matched pairs. Justify a claim based on a confidence interval for a population mean, including the mean difference between values in matched pairs. Identify the relationships between sample size, width of a confidence interval, confidence level, and margin of error for a population mean.	Team Challenge	Textbook - Section 8.3	Ticket-out Homework

\*See key at the end

Title AP Statistics

<b>Review and assessment - 2 days</b>	CC.2.4.HS.B.5					Textbook Chapter 8 Test	Assessment
<b>Setting Up a Test for a Population Mean - 1 day &amp; 1 day</b>	CC.2.4.HS.B.5	t-distribution	How are hypotheses written for a test about a population proportion?	Identify an appropriate testing method for a population mean with unknown $\sigma$ , including the mean difference between values in matched pairs. Identify the null and alternative hypotheses for a population mean with unknown $\sigma$ , including the mean difference between values in matched pairs. Verify the conditions for the test for a population mean, including the mean difference between values in matched pair	Discussion group	Textbook - Section 9.3 and 10.3	Ticket-out Homework
<b>Carrying Out a Test for a Population Mean - 2 days and 1 day</b>	CC.2.4.HS.B.5		What does the p-value tell us in regards to an observed statistic and the hypothesized parameter? How can the results of a hypothesis test be used to justify a claim about the population?	Calculate an appropriate test statistic for a population mean, including the mean difference between values in matched pairs. Interpret the p-value of a significance test for a population mean, including the mean difference between values in matched pairs. Justify a claim about the population based on the results of a significance test for a population mean.	Team Challenge	Textbook - Section 9.3 and 10.3	Ticket-out Homework
<b>Review and Assessment - 2 days</b>	CC.2.4.HS.B.5					Textbook Chapter 9 Test	Assessment
<b>Confidence Intervals for the Difference of Two Means - 1 day</b>	CC.2.4.HS.B.5		How is a confidence interval for the difference of two means calculated?	Identify an appropriate confidence interval procedure for a difference of two population means. Verify the conditions to calculate confidence intervals for the difference of two population means. Determine the margin of error for the difference of two population means. Calculate an appropriate confidence interval for a difference of two population means.		Textbook - Section 10.2	Ticket-out Homework

Title AP Statistics

<b>Justifying a Claim About the Difference of Two Means Based on a Confidence Interval - with previous</b>	CC.2.4.HS.B.5		What does a confidence interval tell us about a difference in two means?	Interpret a confidence interval for a difference of population means. Justify a claim based on a confidence interval for a difference of population means Identify the effects of sample size on the width of a confidence interval for the difference of two means.		Textbook - Section 10.2	Ticket-out Homework
<b>Setting Up a Test for the Difference of Two Population Means - 1 day</b>	CC.2.4.HS.B.5		How are hypotheses written for a test for the difference of two means?	Identify an appropriate selection of a testing method for a difference of two population means. Identify the null and alternative hypotheses for a difference of two population means. Verify the conditions for the significance test for the difference of two population means.		Textbook - Section 10.2	Ticket-out Homework
<b>Carrying Out a Test for the Difference of Two Population Means - 1 day</b>	CC.2.4.HS.B.5		What does the p-value tell us in regards to an observed difference and the hypothesized difference?	Calculate an appropriate test statistic for a difference of two means. Interpret the p-value of a significance test for a difference of population means. Justify a claim about the population based on the results of a significance test for a difference of two population means in context	Team FRQ	Textbook - Section 10.2	Ticket-out Homework
<b>Review and assessment - 2 days</b>	CC.2.4.HS.B.5				Graphic organizer	Textbook Chapter 10 Test	Assessment

Unit total = 18 days

Cumulative total = 100 days

Title AP Statistics

<b>Unit:</b>		<b>Inference for Categorical Data: Chi-Square</b>					
<b>Big Ideas*:</b>		1 & 3					
<b>Unit Essential Questions:</b>		How does increasing the degrees of freedom influence the shape of the chi-square distribution? Why is it inappropriate to use statistical inference to justify a claim that there is no association between variables?					
<b>Concept &amp; Pacing</b>	<b>Pa Core Standard</b>	<b>Key Vocabulary</b>	<b>Essential Questions</b>	<b>Competencies (skills, knowledge, abilities)</b>	<b>Mini-Lessons/Activities</b>	<b>Instructional Materials</b>	<b>Assessments</b>
<b>Introducing Statistics: Are My Results Unexpected? - with next</b>	CC.2.4.HS.B.5			Identify questions suggested by variation between observed and expected counts in categorical data.	Simulation		Ticket-out Homework
<b>Setting Up a Chi-Square Goodness of Fit Test - 2 days</b>	CC.2.4.HS.B.5	Chi-square test statistic Chi-square distribution	How are hypotheses written for chi-square goodness of fit tests?	Describe chi-square distributions. Identify the null and alternative hypotheses in a test for a distribution of proportions in a set of categorical data. Identify an appropriate testing method for a distribution of proportions in a set of categorical data. Calculate expected counts for the chi-square test for goodness of fit. Verify the conditions for making statistical inferences when testing goodness of fit for a chi-square distribution.		Textbook - Section 11.1	Ticket-out Homework
<b>Carrying Out a Chi-Square Test for Goodness of Fit - 2 days</b>	CC.2.4.HS.B.5		What does the p-value tell us about the goodness of fit?	Calculate the appropriate statistic for the chi-square test for goodness of fit. Determine the p-value for chi-square test for goodness of fit significance test. Interpret the p-value for the chi-square test for goodness of fit. Justify a claim about the population based on the results of a chi-square test for goodness of fit.		Textbook - Section 11.1	Ticket-out Homework
<b>Expected Counts in Two-Way Tables - 1 day</b>	CC.2.4.HS.B.5		How are expected counts calculated?	Calculate expected counts for two-way tables of categorical data		Textbook - Section 11.2	Ticket-out Homework

\*See key at the end

Title AP Statistics

<p><b>Setting Up a Chi-Square Test for Homogeneity or Independence - 2 days</b></p>	<p>CC.2.4.HS.B.5</p>		<p>How are hypotheses written for chi-square homogeneity and independence tests?</p>	<p>Identify the null and alternative hypotheses for a chi-square test for homogeneity or independence. Identify an appropriate testing method for comparing distributions in two-way tables of categorical data. Verify the conditions for making statistical inferences when testing a chi-square distribution for independence or homogeneity</p>	<p>Discussion groups</p>	<p>Textbook - Section 11.2</p>	<p>Ticket-out Homework</p>
<p><b>Carrying Out a Chi-Square Test for Homogeneity or Independence - 2 days</b></p>	<p>CC.2.4.HS.B.5</p>		<p>What does the p-value tell us about the homogeneity and independence?</p>	<p>Calculate the appropriate statistic for a chi-square test for homogeneity or independence Determine the p-value for a chi-square significance test for independence or homogeneity Interpret the p-value for the chi-square test for homogeneity or independence Justify a claim about the population based on the results of a chi-square test for homogeneity or independence.</p>		<p>Textbook - Section 11.2</p>	<p>Ticket-out Homework</p>
<p><b>Review and assessment - 2 days</b></p>	<p>CC.2.4.HS.B.5</p>				<p>Graphic organizer</p>	<p>Textbook - Chapter 12 test</p>	<p>Assessment</p>

Unit total = 11 days

Cumulative total = 111 days

Title AP Statistics

<b>Unit:</b>		<b>Inference for Quantitative Data: Slopes</b>					
<b>Big Ideas*:</b>		1, 2, & 3					
<b>Unit Essential Questions:</b>		How can there be variability in slope if the slope statistic is uniquely determined for a line of best fit? When is it appropriate to perform inference about the slope of a population regression line based on sample data? Why do we not conclude that there is no correlation between two variables based on the results of a statistical inference for slopes?					
<b>Concept &amp; Pacing</b>	<b>Pa Core Standard</b>	<b>Key Vocabulary</b>	<b>Essential Questions</b>	<b>Competencies (skills, knowledge, abilities)</b>	<b>Mini-Lessons/Activities</b>	<b>Instructional Materials</b>	<b>Assessments</b>
<b>Introducing Statistics: Do Those Points Align? - with next</b>	CC.2.4.HS.B.5			Identify questions suggested by variation in scatter plots.		Textbook - Section 12.1	Ticket-out Homework
<b>Confidence Intervals for the Slope of a Regression Model - 2 days</b>	CC.2.4.HS.B.5	Population regression line Sample regression line	How can a confidence interval be calculated to represent the slope of a regression model?	Identify an appropriate confidence interval procedure for a slope of a regression model. Verify the conditions to calculate confidence intervals for the slope of a regression model Determine the given margin of error for the slope of a regression model. Calculate an appropriate confidence interval for the slope of a regression model.	Note-taking	Textbook - Section 12.1	Ticket-out Homework
<b>Justifying a Claim About the Slope of a Regression Model Based on a Confidence Interval - 1 day</b>	CC.2.4.HS.B.5		What does the confidence interval tell us about the slope of a regression model?	Interpret a confidence interval for the slope of a regression model. Justify a claim based on a confidence interval for the slope of a regression model. Identify the effects of sample size on the width of a confidence interval for the slope of a regression model.	Error analysis	Textbook - Section 12.1	Ticket-out Homework
<b>Setting Up a Test for the Slope of a Regression Model - 2 days</b>	CC.2.4.HS.B.5		What are the hypotheses for a test about a regression model's slope?	Identify the appropriate selection of a testing method for a slope of a regression model. Identify appropriate null and alternative hypotheses for a slope of a regression model. Verify the conditions for the significance test for the slope of a regression model.		Textbook - Section 12.1	Ticket-out Homework

\*See key at the end

Title AP Statistics

<p><b>Carrying Out a Test for the Slope of a Regression Model - 2 days</b></p>	<p>CC.2.4.HS.B.5</p>		<p>What does p-value of a hypothesis test tell us about the observed slope and the hypothesized slope?</p>	<p>Calculate an appropriate test statistic for the slope of a regression model. Interpret the p-value of a significance test for the slope of a regression model Justify a claim about the population based on the results of a significance test for the slope of a regression model</p>	<p>Notation read aloud</p>	<p>Textbook - Section 12.1</p>	<p>Ticket-out Homework</p>
<p><b>Review and assessment</b></p>	<p>CC.2.4.HS.B.5</p>					<p>Textbook - Chapter 12 test</p>	<p>Assessment</p>

Unit total = 11 days

Cumulative total = 122 days

Key

**BIG IDEA 1: VARIATION AND DISTRIBUTION (VAR)**

The distribution of measures for individuals within a sample or population describes variation. The value of a statistic varies from sample to sample. How can we determine whether differences between measures represent random variation or meaningful distinctions? Statistical methods based on probabilistic reasoning provide the basis for shared understandings about variation and about the likelihood that variation between and among measures, samples, and populations is random or meaningful.

**BIG IDEA 2: PATTERNS AND UNCERTAINTY (UNC)**

Statistical tools allow us to represent and describe patterns in data and to classify departures from patterns. Simulation and probabilistic reasoning allow us to anticipate patterns in data and to determine the likelihood of errors in inference.

**BIG IDEA 3: DATA-BASED PREDICTIONS, DECISIONS, AND CONCLUSIONS (DAT)**

Data-based regression models describe relationships between variables and are a tool for making predictions for values of a response variable. Collecting data using random sampling or randomized experimental design means that findings may be generalized to the part of the population from which the selection was made. Statistical inference allows us to make data-based decisions.