Options EHS Probability and Statistics		Scope and Sequence
Unit	**Lesson**	**Objectives**
Understanding Probability		
	Understanding Probability	
		Identify an event with a given probability as impossible, unlikely, likely, or certain.
		Describe the probability of an event as a number between 0 and 1, which represents the likelihood of the event.
		Use the fact that the sum of the probabilities of all possible outcomes is 1 to find the probabilities of complementary events.
	Theoretical Probability	
		Express the theoretical probabilities of given outcomes of an experiment as a ratio.
		Use a given sample space to calculate the theoretical probabilities of events.
		Use theoretical probability to make predictions.
	Experimental Probability	
		Find the experimental probability of an event, expressing it as a ratio.
		Use experimental probability to make predictions.
	Experimental vs. Theoretical Probability	
		Compare experimental results to theoretical probabilities and make conjectures about the results.
		Explain possible sources of discrepancy between the theoretical and experimental probability of an event.
	Compound Events and Sample Space	
		Identify the sample space for an experiment involving compound events.
		Determine outcomes in a sample space that represents a given compound event.
	Compound Events and the Fundamental Counting Principle	

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Unit	**Lesson**	**Objectives**
		Use the fundamental counting principle to determine the number of possible outcomes.
		Use the fundamental counting principle to determine the probability of compound events.
	Probability of Compound Events	
		Find probabilities of independent compound events using organized lists, tables, or tree diagrams.
		Find probabilities of dependent compound events using organized lists, tables, or tree diagrams.
	Simulations to Estimate Probabilities	
		Design a simulation to experimentally determine the probability of compound events.
		Use a simulation to generate frequencies for compound events; e.g., use a coin to simulate the gender of a baby and find the experimental probability of having exactly 1 boy in a family of three children.
	Unit Test	
Probability		
	Probability of Independent Events	
		Determine if compound events are independent or dependent.
		Calculate probabilities using tree diagrams or the multiplication rule of independent events
	Properties of Probability Distributions	
		Identify properties of a probability distribution.
		Create probability distributions from a data set.
		Solve problems using probability distributions.
	Geometric Probability	
		Identify the probability of landing in a given region of a geometric figure as impossible, unlikely, likely, or certain.
		Calculate geometric probabilities.

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Unit	**Lesson**	**Objectives**
	Unit Test	
Sampling and Comparing Populations		
	Populations and Sampling	
		Explain that statistics can be used to gain information about a population by examining a sample of the population.
		Determine when sampling is an appropriate and helpful measure of a population and when it is not.
	Sampling Methods	
		Compare a random sample to a biased sample in a variety of real-world contexts to determine validity.
		Identify and explain the process for choosing a random sample.
	Inferences and Predictions	
		Make an inference about the whole population based on a sample by using proportional reasoning.
		Examine sample size and the effect on a prediction using the results of a simulation.
	Multiple Samples	
		Use a simulation to generate multiple samples of the same size.
		Compare samples generated from simulations to draw an inference about a population.
	Variation in Predictions and Estimates	
		Analyze the results of multiple samples by comparing the means of samples and populations.
		Describe variations in estimates or predictions of multiple samples.
	Designing a Study	
		Classify study types.
		Classify sampling methods.
		Determine if a sample is biased.

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		Analyze study types and sampling methods.
	Expected Value	
		Calculate expected values.
		Use expected values to make decisions.
	Binomial Distribution	
		Identify a binomial experiment.
		Identify the probability of success, probability of failure, and number of trials for a binomial experiment.
		Calculate binomial probabilities.
	Unit Test	
Data Distributions		
	Plotting Data on a Dot Plot	
		Distinguish between statistical and nonstatistical questions.
		Display data on a dot plot.
	Describing Data on Dot Plots	
		Describe a data set as shown on a dot plot, using the center, spread, and overall shape.
	Analyzing Dot Plots	
		Informally compare shapes of two different data distributions with similar variations.
		Analyze two dot plots with similar variation by comparing the measures of center.
	Representing Data Sets with Histograms	
		Display data on a histogram.

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Unit	**Lesson**	**Objectives**
		Describe a data set as shown on a histogram, using the center, spread, and overall shape.
	Finding the Mean	
		Calculate the mean of a set of data.
		Explain how the mean of a set of data is a balance point.
		Find a missing value in a set of data given the mean.
	Comparing Mean and Median	
		Find the median of a set of data.
		Describe the impact of outliers on the mean and median.
		Choose the most appropriate measure of center to describe a set of data.
	Range and Interquartile Range	
		Define and find the range of a set of data.
		Define and find the interquartile range of a set of data.
		Describe the impact of outliers on the range and interquartile range.
	Box Plots	
		Interpret a box plot.
		Create a box plot to represent a set of data, given the summary statistics.
	Box Plots	
		Create and interpret box plots.
		Analyze box plots for symmetry and outliers.
		Compare box plots.
	Mean Absolute Deviation	
		Calculate the mean absolute deviation for a set of data.

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Unit	**Lesson**	**Objectives**
		Interpret the mean absolute deviation of a set of data.
		Describe the impact of outliers on the mean absolute deviation.
	Unit Test	
Data Analysis		
	Data Displays and Statistics	
		Interpret the shape of a data set in the context of the way in which data was collected.
		Describe the impact of the number of observations on the shape of the data.
		Compare two data sets using measures of center and spread.
	Summarizing Data Sets with Statistics	
		Find the mean, median, range, and interquartile range of a data set.
		Compare two data sets with the same measure of center but different measures of spread.
	Comparing Measures of Center and Variability	
		Analyze two numerical data distributions with similar variation by calculating and comparing the measures of center to the measure of variability.
		Compare the measures of center of two sets of data using a multiple of the measure of variability, expressed as a ratio.
		Draw an informal comparative inference about two sets of data.
	Comparing Box Plots	
		Compare two data sets with different numbers of data points by comparing two box plots.
		Compare two data sets by comparing the difference in the measures of center and the measures of variability.
		Draw an informal comparative inference about two sets of data.
	Describing Data	

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		Identify various data collection methods and analyze various displays of data.
		Determine if a sample fairly represents the population as a whole or if there is bias.
		Informally describe the shape, center, and variability of a distribution based on a dot plot, histogram, or box plot.
	Measures of Center	
		Calculate the mean and median for a set of data using technology when appropriate.
		Compare the mean and median of a set of data that is symmetrical and for a set of data that is not symmetrical, determining which is a better measure of center for a given data set.
		Create a dot plot or histogram for a set of data.
		Discuss the effect of outliers on measures of center.
	Comparing Data Sets	
		Compare two distributions in terms of center, variability, and shape.
		Choose which measure of center, measure of variability, and display should be used to describe a data set.
	Representing Data	
		Describe a data set using measures of central tendency and range.
		Determine if a representation of data is misleading.
Cumulative Exam		
	Cumulative Exam Review	
	Cumulative Exam	