

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	
	Use the fundamental counting principle to determine the number of possible outcomes.

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	Probability of Compound Events	Use the fundamental counting principle to determine the 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.
	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.
	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.

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	Sampling Methods	<p>Compare a random sample to a biased sample in a variety of real-world contexts to determine validity.</p> <p>Identify and explain the process for choosing a random sample.</p>
	Inferences and Predictions	<p>Make an inference about the whole population based on a sample by using proportional reasoning.</p> <p>Examine sample size and the effect on a prediction using the results of a simulation.</p>
	Multiple Samples	<p>Use a simulation to generate multiple samples of the same size.</p> <p>Compare samples generated from simulations to draw an inference about a population.</p>
	Variation in Predictions and Estimates	<p>Analyze the results of multiple samples by comparing the means of samples and populations.</p> <p>Describe variations in estimates or predictions of multiple samples.</p>
	Designing a Study	<p>Classify study types.</p> <p>Classify sampling methods.</p> <p>Determine if a sample is biased.</p> <p>Analyze study types and sampling methods.</p>
	Expected Value	<p>Calculate expected values.</p> <p>Use expected values to make decisions.</p>
	Binomial Distribution	<p>Identify a binomial experiment.</p>

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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.

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.

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		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.
		Interpret the mean absolute deviation of a set of data.
		Describe the impact of outliers on the mean absolute deviation.
	Unit Test	
Cumulative Exam		
	Cumulative Exam Review	
	Cumulative Exam	