

Pre-Algebra – Unit 6: Statistics and Probability

Phoenixville Area School District

Stage 1 Desired Results		
<p>PA Core Standards: M07.D-S.1.1 Use random samples. M07.D-S.2.1 Use statistical measures to compare two numerical data distributions. M07.D-S.3.1 Predict or determine the likelihood of outcomes. M07.D-S.3.2 Use probability to predict outcomes.</p> <p>PSSA Assessment Anchors: M07.D-S.1 Use random sampling to draw inferences about a population. M07.D-S.2 Draw comparative inferences about populations. M07.D-S.3 Investigate chance processes and develop, use, and evaluate probability models.</p>	<p><i>Transfer</i></p>	
	<p>TRANSFER GOALS <i>Students will be able to independently use their learning to...</i></p> <ul style="list-style-type: none"> ● Number Sense: Develop a sound foundation to demonstrate the value of numbers by describing their various representations, relationships, and patterns. ● Problem-Solving: Persistently apply various problem-solving strategies and organized approaches to accurately understand and solve problems and provide evidence to support response. ● Mathematical Vocabulary: Interpret mathematical vocabulary and apply proper terminology to engage in meaningful oral and written expression that communicates mathematical thinking, problem-solving methods, and rationale. 	
	<p><i>Meaning</i></p>	
	<p>UNDERSTANDINGS <i>Students will understand that...</i></p> <ul style="list-style-type: none"> ● A study of probability helps illuminate the randomness of our everyday world. ● The formulation of the question affects the design and execution of the experiment. ● Selection of the appropriate statistical method to analyze data will progress towards solutions and subsequent inferences. ● The way that data is collected, organized and displayed influences interpretation and decision-making. ● The likelihood of an occurrence is governed by specific rules that can be used as a basis for prediction/determining possible outcomes with varying degrees of confidence. 	<p>ESSENTIAL QUESTIONS <i>Students will keep considering...</i></p> <ul style="list-style-type: none"> ● How do mathematicians predict the future? What makes the prediction reasonable? ● How do I use tools/displays to accurately represent data? How does this display impact the decisions people might make? ● What makes data trustworthy? When should I be suspicious? ● What story does this data set/display tell? ● How can mathematics be used to provide models that help us interpret data and make predictions?

Knowledge and Skills Acquisition	
	<p>KNOWLEDGE <i>Students will know...</i></p> <ul style="list-style-type: none"> • Inferences about populations based on random sampling concepts. • Methods to find measures of center and measures of variability. • Probability near 0 indicates an unlikely event, a probability around 1/2 indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event. • Approximate relative frequency given the probability. • Organized lists, tables, tree diagrams, and simulations are compound events. <p>VOCABULARY</p> <ul style="list-style-type: none"> • Probability • Likelihood • Measures of Center • Measures of Variability • Samples • Box-and-Whisker
	<p>SKILLS <i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> • Determining whether a sample is a random sample given a real-world situation. • Using data from a random sample to draw inferences about a population with an unknown characteristic of interest. • Comparing two numerical data distributions using measures of center and variability. • Predicting whether some outcomes are certain, more likely, less likely, equally likely, or impossible. • Determining the probability of a chance event given relative frequency. • Find the probability of a simple event, including the probability of a simple event not occurring. • Find probabilities of independent compound events.

Stage 2 – Evidence

Code A/M/T	Evaluative Criteria	Assessment Evidence	
<p>A/M/T</p> <p>Acquisition</p> <p>Meaning Making</p> <p>Transfer</p>	<p><i>What criteria will be used in each assessment to evaluate attainment of the</i></p>	<p>PERFORMANCE TASK(S) <i>Students will demonstrate understanding (meaning making and transfer) through complex performance by...</i></p> <p>Counters Using theoretical and experimental outcomes, make a prediction about events.</p> <ul style="list-style-type: none"> • Goal: Your task is to decide if a game at the school fair will generate profits. • Role/Audience: You are a student testing another student's idea. 	<p>Differentiation Considerations:</p>

<p><i>desired results?</i></p>	<ul style="list-style-type: none"> • Situation/Product: You will construct an argument about a fair game and assume a position of pro or con given details. • Success Criteria: Your explanation will include a strategy to change the game to result in a desired outcome. <p>Fair Game? Use probability to judge the fairness of a board game.</p> <ul style="list-style-type: none"> • Goal: Your task is to decide if a board game to be used in the game club at the middle school has reasonable elements. • Role/Audience: You are a student testing another student's idea in a club at your school. • Situation/Product: You will construct an argument about a board game and defend the fairness of it. • Success Criteria: Your explanation will estimate the probability of future events. <p>Candy Bars Analyze the results of a survey of the number of candy bars eaten by males and females over a week's time to guide a school store's advertising.</p> <ul style="list-style-type: none"> • Goal: Your task is to decide if the school store's advertising should be gender specific. • Role/Audience: You are a student that works in a school store and devising strategies to make profits regarding the sale of candy bars. • Situation/Product: After analyzing the results of a survey, a chart or graph will be illustrated. • Success Criteria: Your explanation will include a reason that another classmate, Chris, is accurate or not in his statement. <p>Counting Trees Design an experiment to estimate the number of old and young trees in a given forest when provided with a visual.</p> <ul style="list-style-type: none"> • Goal: Your task is to provide a strategy to use to estimate the number of old and young trees and give evidence to support its reliability. • Role/Audience: You are a student working as an intern for an environmental company. • Situation/Product: You will construct a sampling strategy. • Success Criteria: Your explanation will include a reason that the sampling strategy was correct and that the number of trees can be estimated. 	
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<p>A/M/T</p> <p>Acquisition</p> <p>Meaning Making</p> <p>Transfer</p>	<p><i>What criteria will be used in each assessment to evaluate attainment of the desired results?</i></p>	<p>OTHER EVIDENCE</p> <p>Unit Test</p> <ul style="list-style-type: none"> • Multiple Choice • True/False • Matching • How are the measures of center (mean, median, and mode) different from the measures of variability (range, quartiles, and interquartile range)? • Explain a situation in which using the data from a random sampled survey to make a prediction is feasible. • Differentiate between mean and mean absolute deviation. 	<p>Differentiation Considerations:</p>
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