

Big Understandings of the Content Area

*Draw conclusions from data

*Use statistical methods appropriately

*Use probability theory correctly when using inferential statistics

	<u>Content Standards</u> B. COMPUTATION: Students will understand and demonstrate computation skills.	C. DATA ANALYSIS AND STATISTICS: Students will understand and apply concepts of data analysis.	D. PROBABILITY: Students will understand and apply concepts of probability.
	<u>Performance Indicators</u> Student will be able to: ♦ Use various techniques to approximate solutions, determine the reasonableness of answers, and justify the results.	<u>Performance Indicators</u> Student will be able to: ♦ Determine and evaluate the effect of variables on the results of data collection. ♦ Predict and draw conclusions from charts, tables, and graphs that summarize data from practical situations. ♦ Demonstrate an understanding of concepts of standard deviation and correlation and how they relate to data analysis. ♦ Demonstrate an understanding of the idea of random sampling and recognition of its role in statistical claims and designs for data collection. ♦ Revise studies to improve their validity (e.g., in terms of better sampling, better controls, or better data analysis techniques)	<u>Performance Indicators</u> Student will be able to: ♦ Find the probability of compound events and make predictions by applying probability theory. ♦ Create and interpret probability distributions.
	<u>Knowledge/Skills</u> ♦ Cross-cutting: used in all areas	♦ Identify the four basic sampling techniques. ♦ Organize data using frequency distributions. ♦ Represent data in frequency	Use tree diagrams for counting outcomes. Use multiplication rules. Find number of permutations. Find number of combinations. Determine sample space. Determine probability of an event (theoretical and empirical).

		<p>distributions graphically using histograms, frequency polygons, and ogives.</p> <ul style="list-style-type: none"> ♦ Represent data using Pareto charts, time series graphs, and pie graphs. ♦ Summarize data using the measures of central tendency (mean, median, mode and midrange). ♦ Describe data using the measures of variation (range, variance, standard deviation). ♦ Use measures of position (percentiles, deciles, quartiles). ♦ Use techniques of Exploratory Data Analysis (stem-and-leaf, boxplots, five-number summaries). ♦ Identify distributions as symmetrical or skewed. ♦ Find a confidence interval for the mean. ♦ Find minimum sample size for confidence interval for mean. ♦ Find a confidence interval for a proportion. ♦ Find minimum sample size for confidence interval for mean. ♦ Find a confidence interval for standard deviation and variance. ♦ Understand definitions used in hypothesis testing. ♦ State the null and alternative hypothesis. ♦ Find critical values for the z test. ♦ State the five steps used in 	<p>Determine probability of compound events. Determine conditional probability. Use counting rules to determine probability. Construct a probability distribution for a random variable. Find the probability of x successes in n trials in binomial probability experiment. Find the mean, variance, and standard deviation for the variable of a probability distribution. Find probabilities for outcomes of variables using the Poisson, hypergeometric, and multinomial distributions. Identify the properties of the normal distribution. Find the area under the standard normal distribution curve. Find probabilities for a normally distributed variable using the standard normal variable. Use standard normal distribution to find specific data. Use the Central Limit Theorem to solve problems involving sample means. Use the normal approximation to compute probabilities for a binomial variable.</p>	
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		<p>hypothesis testing.</p> <ul style="list-style-type: none"> ♦ Use the z test to test means for large samples. ♦ Use the t test to test means for small samples. ♦ Use the z test to test proportions. ♦ Use the chi-square test to test variances or standard deviation. ♦ Test hypotheses using confidence intervals. ♦ Explain the relationship between type I and type II errors. ♦ Find the correlation coefficient. ♦ Test the hypothesis: $H_0: \rho=0$ ♦ Find the equation of the regression line. 		
	<p>Assessment</p> <ul style="list-style-type: none"> ♦ Quizzes ♦ Daily tasks ♦ Test ♦ Projects 	Same	Same	
	<p>Resources</p> <ul style="list-style-type: none"> ♦ Text: Elementary Statistics, 4th Ed.; Bluman; McGraw Hill; 2001 	Same	Same	
	<p>Instructional Strategies</p> <ul style="list-style-type: none"> ♦ Lecture ♦ Experiment (Discovery) ♦ Cooperative Learning 	Same	Same	

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<p><u>Content Standards</u></p>					
<p>G. PATTERNS, RELATIONS, FUNCTIONS: Students will understand that mathematics is the science of patterns, relationships, and functions.</p>		<p>I. DISCRETE MATHEMATICS: Students will understand and apply concepts in discrete mathematics.</p>	<p>J. MATHEMATICAL REASONING: Students will understand and apply concepts of mathematical reasoning.</p>	<p>K. MATHEMATICAL COMMUNICATION: Students will reflect upon and clarify their understanding of mathematical ideas and relationships.</p>	
<p><u>Performance Indicators</u></p>					
<p>Students will be able to:</p> <ul style="list-style-type: none"> ♦ Create a graph to represent a real-life situation and draw inferences from it. ♦ Model phenomena using a variety of functions. 		<p>Students will be able to:</p> <p>Apply strategies from game theory to problem solving situations.</p>	<p>Students will be able to:</p> <ul style="list-style-type: none"> ♦ Analyze situations where more than one logical conclusion can be drawn from data. ♦ Use inductive reasoning to make conjectures. ♦ Support reasoning by using models, known facts, properties, or relationships. 	<p>Students will be able to:</p> <ul style="list-style-type: none"> ♦ Restate, create, and use definitions in mathematics to express understanding, classify figures, and determine the truth of a proposition or argument. ♦ Read mathematical presentations of topics within the Learning Results with understanding. 	
<ul style="list-style-type: none"> ♦ Draw a scatter plot for a set of ordered pairs. 		<p>Find the mean, variance, and expected value for a discrete random variable.</p>	<ul style="list-style-type: none"> ♦ Cross-cutting: used in all areas. 	<ul style="list-style-type: none"> ♦ Demonstrate knowledge of all statistical terms. ♦ Differentiate between inferential and descriptive statistics. ♦ Identify types of data. ♦ Identify the measurement level for each variable. 	
Same		Same	Same	Same	
Same		Same	Same	Same	
Same		Same	Same	Same	