Mount Pleasant Central School District

AP Statistics, Math

We believe that students should learn the mathematical practice standards by showing the connections between real world problems and mathematical solutions by modeling, explorations and discovery.

How can we use data to understand the world, draw valid conclusions, and make informed decisions? In this class, students will learn to analyze data patterns, plan and conduct studies to collect data, use probability to understand and model random events, and apply statistical methods to make inferences and test hypotheses about populations. Our main goal is to empower students to investigate questions of interest using appropriate statistical methods to draw sound conclusions accepted by experts across various fields. We emphasize understanding how statistical phenomena are found and used. Assessment will be primarily through a cumulative testing in the style of College Board exams in preparation for the AP Exam

Unit Title	Month	Content	Vocabulary	Standards	Skills	Big Ideas	Assessments
Display Data	September	Types of graphs 5 number summary	Histogram Dot plot Box plot Quantitative Qualitative	Construct numerical or graphical representations of distributions. (CBAPSTAT-2.B)	Students will create an appropriate graph based on the data type. Students will calculate an outlier.	Students will be able to create an appropriate graph based on the type of data being explored.	Test in the style of the AP Exam.
Center and Spread	October	Standard deviation: Summary statistics	Percentile Mean Median Standard deviation IQR Outlier	Calculate summary statistics, relative positions of points within a distribution, correlation, and predicted response. (CBAPSTAT-2.C)	Students will describe a distribution. Students will compare multiple distributions.	Students will be able to describe data in regard to varying centers, shapes, and unique features.	Test in the style of the AP Exam.
Normal Distribution	October	Z-Score NormalCDF	Standard deviation Mean Standard statistic	Compare distributions or relative positions of points within a distribution. (CBAPSTAT-2.D)	Calculate and use the Z-score to describe the positioning of values.	Students will be able to interpret values from a normal curve.	Test in the style of the AP Exam.
Bi-Variate Data	November	Scatterplots Least squares regression	Independent variable Dependent variable	Calculate summary	Students will create and interpret a linear	Students will be able to represent and explore a	Test in the style of AP Exam.

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Unit Title	Month	Content	Vocabulary	Standards	Skills	Big Ideas	Assessments
		line	Correlation Causation Strength Predicted value	statistics, relative positions of points within a distribution, correlation, and predicted response. (CBAPSTAT-2.C)	regression. Students will create a residual plot.	data point with two components. Students will be able to form predictive models based on the data.	
Experimental Design	November	Experiment vs observation Sampling methods	Experiment Observation Random Blocking Simple Random Sample Cluster Placebo,	Describe an appropriate method for gathering and representing data. (CBAPSTAT-1.C)	Students will create a sample using appropriate methods to achieve useful results.	Students will be able to properly create a random sample from a population.	Test in style of AP Exam.
Probability	December	Probability laws Probability of two way tables	Event Complement OR Conditional	Determine relative frequencies, proportions, or probabilities using simulation or calculations. (CBAPSTAT-3.A)	Students will use probability laws to calculate the likelihood of various events.	Students will be able to predict the probability of events.	Test in style of AP Exam.
Random Variables	January	Expected value Standard deviation	Discrete Independent	Interpret statistical	Students will calculate the expected value of an event.	Students will be able to calculate the projected	Test in style of AP Exam.

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Unit Title	Month	Content	Vocabulary	Standards	Skills	Big Ideas	Assessments
				calculations and findings to assign meaning or assess a claim. (CBAPSTAT-4.B)		value of an outcome over a long run of events.	
Geometric and Binomial	January	Binomial distribution Geometric distribution	Binomial Geometric Cumulative	Determine relative frequencies, proportions, or probabilities using simulation or calculations. (CBAPSTAT-3.A)	Students will calculate the probability of a precise amount of a total or a series of events of a total. Students will calculate the probability of a first occurrence or a series of first occurrences.	Students will be able to differentiate between the occurrence of a first event and some of a whole. Students will be able to calculate the probability of those events happening.	Test in style of AP Exam.
Inference 1 Proportion and Interval	February	1 sample proportion hypothesis test 1 sample confidence interval	Sample proportion Hypothesis test Confidence interval Test statistics	Construct a confidence interval, provided conditions for inference are met. (CBAPSTAT-3.D) Calculate a test statistic and find a p-value,	Students will create a properly formatted 1 sample proportion hypothesis test and confidence interval.	Students will be able to assess the validity of a hypothesis based on a sample and create a range that contains the actual value.	Test in style of AP Exam.

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Unit Title	Month	Content	Vocabulary	Standards	Skills	Big Ideas	Assessments
				provided conditions for inference are met. (CBAPSTAT-3.E)			
Inference 2 Proportion and Interval	February	2 sample mean hypothesis test 2 sample mean interval	Sample mean Sample standard deviation Hypothesis test Confidence interval Test statistics	Construct a confidence interval, provided conditions for inference are met. (CBAPSTAT-3.D) Calculate a test statistic and find a p-value, provided conditions for inference are met. (CBAPSTAT-3.E)	Students will create a properly formatted 21 sample proportion hypothesis test and confidence interval.	Students will be able to assess the validity of a hypothesis based on a sample and create a range that contains the actual value.	Test in style of AP Exam.
Other Inference Tests	March - May	Chi squared tests, Linear regression test/interval	Expected value Chi squared test statistic	Construct a confidence interval, provided conditions for inference are met. (CBAPSTAT-3.D) Calculate a test statistic and find a p-value,	Students will create a chi squared goodness of fit hypothesis test and test of independence. Students will create a linear regression T test and	Students will be able to assess the validity of a hypothesis based on a sample and create a range that contains the actual value.	Test in style of AP Exam.

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				provided conditions for inference are met. (CBAPSTAT-3.E)	interval.		
Applied Real Life Application	May - June	Real life application of full curriculum.			Students will apply content of the curriculum to explore a null hypothesis found from a real world source.	Students will be able to apply the curriculum to a real life question.	Students put all of their learned skills to explore a question of interest. Students will present their results in a presentation and scholarly paper.