Elizabethtown Area School District Curriculum
Date Adopted: 2019

Grade, Subject: 11-12th Probability and Statistics	
Strand (Unit): Exploring Data: Distributions	
Big Idea: Data collecting basic	

PA Content Standards:	**PA Core Standards:**
	13.3.11.E: Evaluate time management strategies and their application to both personal and work situations. 13.1.11.A: Relate careers to individual interests, abilities and aptitudes. 13.1.11.B: Analyze career options based on personal interests, abilities, aptitudes, achievements and goals. 13.1.11.E: Justify the selection of a career.
Essential Questions: 1. What is a sample? 2. What conclusions can be drawn from a sample? 3. What concerns need to be accounted for while sampling? 4. What can be done to control confounding factors?	**Understandings (SWKT…):** Students will know 1a. What are observational units. 1b. What type of data is being collected. 2a. Difference in data sets. 3a. What different bias there are. 3b. Where bias comes from. 4a. Proper way to conduct experiments. 4b. How randomness controls confounding factors.

Vocabulary:	Skills (SWBAT…):
Observational unit Variable Data Variability Quantitative Categorical Binary Levels of Measurement Nominal Ordnial Interval Ratio Tendency Consistency Center Spread Outlier Population Sample Convenience sample Voluntary sample Parameter Statistic Explanatory Response	● Students will be able to 1a. Identify the observational units. 1b. Identify the different data types. 2a. Comparing dotplots. 2b. Comparing proportional double bar graphs. 3a. Identify sampling errors and non-sampling errors. 3b. What type of sampling can cause which bias. 4a. Take a random sample. 4b. Use blinding in an experiment. 4c. Having a control group to compare response variables.
Assessments: Ch 1 Test Ch 1 Quizzes	Resources: Internet Teacher created material

Elizabethtown Area School District Curriculum
Date Adopted:

Grade, Subject: 11-12th Probability and Statistics	
Strand (Unit): Summarizing Data	
Big Idea: Describing quantitive data	
PA Content Standards: CCSS.Math.Content.HSS.ID.A.1 CCSS.Math.Content.HSS.ID.A.2 CCSS.Math.Content.HSS.ID.A.3 CCSS.Math.Content.HSS.ID.B.5 CCSS.Math.Content.HSS.CP.A.4	**PA Core Standards:** ● 13.3.11.E: Evaluate time management strategies and their application to both personal and work situations. ● 13.1.11.A: Relate careers to individual interests, abilities and aptitudes. ● 13.1.11.B: Analyze career options based on personal interests, abilities, aptitudes, achievements and goals. ● 13.1.11.E: Justify the selection of a career.
Essential Questions: 1. How do you organize two factor data sets? 2. How do you display quantitive data? 3. How do you describe quantitive data?	**Understandings (SWKT…):** 1a. What are conditional and marginal distribution. 2a. What is the distribution of a data set. 3a. How to describe the features of a data set.
Vocabulary: 2-way table Conditional probability Marginal probability Simpson's paradox Mean Median Mode Resistant Histogram Center Spread Outliers Boxplot Range Standard deviation	**Skills (SWBAT…):** 1a. Put a data set into a 2-way table. 1b. Calculate the conditional and marginal distribution. 1c. Connect Simpson's paradox to a situation. 2a. Construct a histogram. 2b. Construct a box plot 3a. Calculate the central tendencies and measure of spread. 3b. Calculate outliers.

IQR Five number summary	
Assessments: Ch 2 Test Ch 2 Quizzes	**Resources:** Internet Teacher created material

Elizabethtown Area School District Curriculum
Date Adopted:

Grade, Subject: 11-12th Probability and Statistics	
Strand (Unit): Data Collection	
Big Idea: How do you collect useful data	
PA Content Standards:	**PA Core Standards:** ● 13.3.11.E: Evaluate time management strategies and their application to both personal and work situations. ● 13.1.11.A: Relate careers to individual interests, abilities and aptitudes. ● 13.1.11.B: Analyze career options based on personal interests, abilities, aptitudes, achievements and goals. ● 13.1.11.E: Justify the selection of a career.

Essential Questions:	Understandings (SWKT…):
1. How are real life situations simulated? 2. How do you take a sample that represents the population? 3. What situations can utilize observations and experiments?	1a. How to run an appropriate simulation. 1b. The difference between independent and dependent events. 2a. Different methods of sampling a population. 3a. How to use randomness to collect useful data. 3b. How to collect data from observational units in their natural state.
Vocabulary: Simulation Conponent Trial Outcome Response SRS Stratified Clustered Systematic Undercoverage Experiment Observation Retrospective Prospective Block Random assignment Bar graph Pie chart	Skills (SWBAT…): 1a. Select appropriate values to represent a situation 1b. Identify the compoents of a simulation. 1c. Draw a conclusion from the simulation. 2a. Identify and conduct different sampling methods; systematic, stratified, cluster, SRS. 2b. Identify bias from the used sampling method. 3a. Use randomness to collect data where a cause and effect conclusion can be drawn. 3b. Collect data through observation.
Assessments: Ch 3 Test Ch 3 Quizzes	Resources: Internet Teacher created material

Elizabethtown Area School District Curriculum
Date Adopted:

Grade, Subject: 11-12th Probability and Statistics	
Strand (Unit): Normal Distribution	
Big Idea: Describing a population with a normal distribution.	
PA Content Standards: CCSS.Math.Content.HSS.ID.A.4	PA Core Standards: ● 13.3.11.E: Evaluate time management strategies and their application to both personal and work situations. ● 13.1.11.A: Relate careers to individual interests, abilities and aptitudes. ● 13.1.11.B: Analyze career options based on personal interests, abilities, aptitudes, achievements and goals. ● 13.1.11.E: Justify the selection of a career.
Essential Questions: 1. What are the features of a normal distribution? 2. How do you find the probability of an event in a normal distribution?	Understandings (SWKT…): 1a. The different shapes of a distributions. 1b. How the standard deivation effects the shape of denisty curve. 1c. What an uniformied distribution is. 2a. What the empricial rule is. 2b. How to use the distribution to find probability. 2c. How the sample size effects the standard deivation.

Vocabulary:	Skills (SWBAT…):
Skewed Uniformed Empricial rule Standard score z-score Central Limit Theorem	1a. Identify the shape of a distribution. 1b. Identify situations that would have an uniformed distribution. 2a. Find probability using the empricial rule. 2b. Find probability with standard score/z-score. 2c. Apply the central limit theorem to the given sample.
Assessments: Ch 5 Tests Ch 5 Quizzes	Resources: Internet Teacher created material

Elizabethtown Area School District Curriculum
Date Adopted:

Grade, Subject: 11-12th Probability and Statistics	
Strand (Unit): Regression	
Big Idea: What is the relationship between two quantitive variables?	

PA Content Standards:	PA Core Standards:
CCSS.Math.Content.HSS.ID.B.6 CCSS.Math.Content.HSS.ID.B.6.c CCSS.Math.Content.HSS.ID.C.7 CCSS.Math.Content.HSS.ID.C.8 CCSS.Math.Content.HSS.ID.C.9	13.3.11.E: Evaluate time management strategies and their application to both personal and work situations. 13.1.11.A: Relate careers to individual interests, abilities and aptitudes. 13.1.11.B: Analyze career options based on personal interests, abilities, aptitudes, achievements and goals. 13.1.11.E: Justify the selection of a career.
Essential Questions: 1. What does a scatterplot show? 2. How can the regression be used to solve problem?	**Understandings (SWKT…):** 1a. The features of a scatterplot. 2a. How to find the regression equation. 2b. How to use the regression equation to make predictions.
Vocabulary: Scatterplot Correlation Regression Linear Strength Form Residual	**Skills (SWBAT…):** 1a. Describe the strength, direction, and form of a scatterplot. 1b. Interpret the slope and y-intrecept. 1c. Construct a scatterplot. 2a. Find the regression equation using algebra or technology. 2b. Use the regression equation to make predictions. 2c. Use correlation to determine the confidence in the predictions.
Assessments: Ch 6 Test Ch 6 Quizzes	**Resources:** Internet Teacher created material

Elizabethtown Area School District Curriculum
Date Adopted:

Grade, Subject: 11-12th Probability and Statistics	
Strand (Unit): Probability	
Big Idea: How do you find the probability of an event?	
PA Content Standards: CCSS.Math.Content.HSS.CP.A.1 CCSS.Math.Content.HSS.CP.A.2 CCSS.Math.Content.HSS.CP.B.7 CCSS.Math.Content.HSS.CP.B.8 CCSS.Math.Content.HSS.CP.B.9 CCSS.Math.Content.HSS.MD.A.1 CCSS.Math.Content.HSS.MD.A.2 CCSS.Math.Content.HSS.MD.A.3	**PA Core Standards:** ● 13.3.11.E: Evaluate time management strategies and their application to both personal and work situations. ● 13.1.11.A: Relate careers to individual interests, abilities and aptitudes. ● 13.1.11.B: Analyze career options based on personal interests, abilities, aptitudes, achievements and goals. ● 13.1.11.E: Justify the selection of a career.
Essential Questions: 1. How do you find the probability of compound events? 2. What is the binomial distribution? 3. How do you find the number of outcomes to a situation?	**Understandings (SWKT…):** 1a. How to find probability of compound events. 1b. How to find probability of events with multiple actions. 2a. What the binomial distribution is. 3a. What the four methods of counting are.
Vocabulary: Simple event Compound event Independent events Dependent events Premutation Combination Factorial FCP	**Skills (SWBAT…):** 1a. Identify situations that are considered the addition rule and find the probability of it 1b. Identify situation that are considered the multiplication rule and find the probability of it. 2a. Identify situation that are binomial distirbution. 2b. Use the formula and technology to find the binomial probability. 3a. Identify the appropriate method of counting for a given situation; permutation, combination,

	fundamental counting prinicpal, factorial.
Assessments: Ch 7 Test Ch 7 Quizzes	**Resources:** Internet Teacher created material

Elizabethtown Area School District Curriculum
Date Adopted:

Grade, Subject: 11-12th Probability and Statistics	
Strand (Unit): Inference	
Big Idea: Drawing conclusion about a population based on samples.	
PA Content Standards: CCSS.Math.Content.HSS.IC.A.1 CCSS.Math.Content.HSS.IC.B.4 CCSS.Math.Content.HSS.IC.B.5	**PA Core Standards:** ● 13.3.11.E: Evaluate time management strategies and their application to both personal and work situations. ● 13.1.11.A: Relate careers to individual interests, abilities and aptitudes. ● 13.1.11.B: Analyze career options based on personal interests, abilities, aptitudes, achievements and goals. ● 13.1.11.E: Justify the selection of a career.

Essential Questions:	Understandings (SWKT…):
1. What does a single sample say about a population? 2. Is there a difference between two populations? 3. What is the distribution of a population?	1a. How to estimate the population mean or proportion of a sample. 1b. How to test claims about a single population. 2a. How to compare populations' means or proportions. 3a. How to compare dependent samples. 4a. How to determine if a populatin fits a given distribution.
Vocabulary: Sampling distribution Statistical significant Statistical confidence Margin of error Null hypothesis Alternative hypothesis Test statistic p-value Alpha level T-test Z-test Error Goodness-of-Fit Contingency table Chi-square Expected value Standard error	Skills (SWBAT…): 1a. Construct confidence intervals for means or proportions from one sample. 1b. Run a hypothesis test for a mean or proportion from one sample. 2a. Construct a confidence interval for the difference in means or proportions from two independent samples. 2b. Run a hypothesis test for comparing the means or proportions from two independent samples. 3a. Construct a confidence interval for the difference if means in a matched pair data set. 3b. Run a matched pair hypothesis test. 4a. Run a hypothesis test for contingency tables; for independence and homogeneity. 4b. Run a Goodness-of-Fit test. 4c. Determine the conponent that does not fit the distribution from the population.
Assessments: Ch 8, 9, and 10 tests Ch 8, 9, and 10 quizzes	Resources: Internet Teacher created material