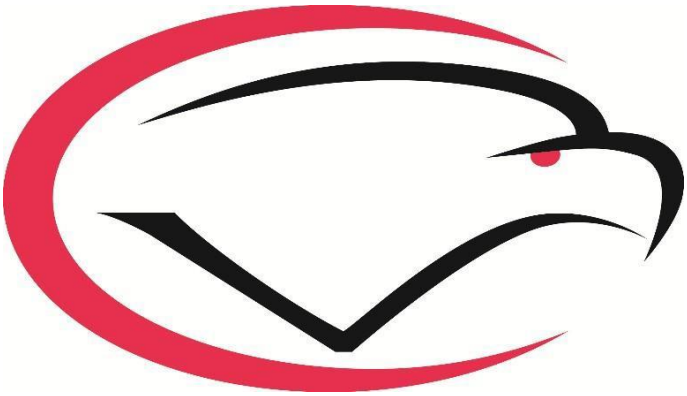
Secondary Curriculum Maps



Cumberland Valley School District

Soaring to Greatness, Committed to Excellence

Statistics

Grade:			SUBJECT
Unit	**Timeline**	**Topics**	**Priority Standards**
Collecting and Displaying Data	6 weeks	Data Collection and Sampling Techniques	**CC.2.4.HS.B.4 - Recognize and evaluate random processes underlying statistical experiments.**
		Categorical Data Displays	**CC.2.4.HS.B.1 - Summarize, represent, and interpret data on a single count or measurement variable.**
		Quantitative Data Displays	**CC.2.4.HS.B.1 - Summarize, represent, and interpret data on a single count or measurement variable.**
Exploring Data	8 weeks	Summary Statistics	**CC.2.4.HS.B.1 - Summarize, represent, and interpret data on a single count or measurement variable.**
		Normal Distributions	
Probability	6 weeks	Probability Rules	**CC.2.4.HS.B.7 - Apply the rules of probability to compute probabilities of compound events in a uniform probability model.**
		Probability Distributions	
Linear Regression and The Basics of Inference Procedures	6 weeks	Linear Regression	**CC.2.4.HS.B.5 - Make inferences and justify conclusions based on sample surveys, experiments, and observational studies.**
		Sampling Distributions	
Confidence Intervals and Significance Testing	10 weeks	Confidence Intervals	**CC.2.4.HS.B.5 - Make inferences and justify conclusions based on sample surveys, experiments, and observational studies.**
		Significance Testing	

CVSD *Statistics L2* Curriculum Map

CV Priority Standard/PA Academic Standard	
CC.2.4.HS.B.7 - Apply the rules of probability to compute probabilities of compound events in a uniform probability model.	
Taught in Unit(s)	
Probability	
Explanation/Example of Standard	
● Calculate the chances of multiple events occurring consecutively or in tandem	
Common Misconceptions	
● An expected value is not a guarantee that an event will occur ● Mutually Exclusive and Independent events are often confused	
Big Idea(s)	**Essential Question(s)**
● Patterns exhibit relationships that can be extended, described, and generalized	● How can probability be used to make predictions? ● How can patterns be used to describe to relationships in mathematical situations?
Assessments	
See file for specific unit common assessments.	
Concepts (what students need to know)	**Skills** (what students must be able to do)
● Binomial Probability ● Discrete Probability Distribution ● Sample Space ● Event ● Counting Techniques: Combinations, Permutations, Multiplication Rule for Counting ● Complement ● Independent Events ● Conditional Probability ● Expected Value	● Describe the probability model ● Determine the probability of an event ● Determine the probability distribution applicable to the experiment/trials ● Distinguish between conditional events and independent events

CVSD *Statistics L2* Curriculum Map

CV Priority Standard/PA Academic Standard
CC.2.4.HS.B.5 - Make inferences and justify conclusions based on sample surveys, experiments, and observational studies.
Taught in Unit(s)
Linear Regression and the Basics of Inference Procedures Confidence Intervals and Hypothesis Testing
Explanation/Example of Standard
● Use characteristics of data to make generalizations ● Use characteristics of data to draw conclusions ● Interpret the relationship between two quantitative variables
Common Misconceptions
● Confidence Intervals do not indicate the movement of a populations' parameter ● Hypothesis testing does not allow you to accept an alternative hypothesis ● Correlation does not indicate causation

Big Idea(s)	Essential Question(s)
● Data can be modeled and used to make inferences ● Mathematical relations and functions can be modeled through multiple representations and analyzed to raise and answer questions	● How can data analysis be used to make predictions? ● How can data provide insight into relationships between quantities?

Assessments	
See file for specific unit common assessments.	
Concepts (what students need to know)	**Skills** (what students must be able to do)
● Confidence Intervals ● Linear Regression, Scatterplots, Correlation vs. Causation ● Interpolation vs. Extrapolation ● Point Estimates ● Critical Values ● Margin of Error ● Hypothesis Testing ● Significance Level ● P-values	● Use characteristics of data to make generalizations ● Use characteristics of data to draw conclusions ● Interpret the relationship between two quantitative variables

CVSD *Statistics L2* Curriculum Map

CV Priority Standard/PA Academic Standard	
CC.2.4.HS.B.4 - Recognize and evaluate random processes underlying statistical experiments.	
Taught in Unit(s)	
Collecting and Displaying Data	
Explanation/Example of Standard	
• Methods by which data is collected significantly impacts the quality of information that can be gleaned • Conclusions about and decisions made by using data are impacted by the quality of the data	
Common Misconceptions	
• Statistic and Parameter are often confused • Inaccurate data is not always unreliable • Randomness cannot be chosen or selected by an individual	
Big Idea(s)	**Essential Question(s)**
• Quantitative measurements and qualitative characteristics can be collected and analyzed to illustrate patterns	• How can you efficiently and effectively collect information that is representative of a population of interest?
Assessments	
See file for specific unit common assessments.	
Concepts (what students need to know)	**Skills** (what students must be able to do)
• Sampling Techniques • Reliability/Validity/Accuracy/Bias • Statistic vs. Parameter • Data: Qualitative vs. Quantitative • Observational Study vs. Experiment • Sample vs. Census	• Identify a sampling technique • Determine the existence of bias in a sampling technique • Evaluate the strengths and weaknesses of a statistical study

CVSD *Statistics L2* Curriculum Map

CV Priority Standard/PA Academic Standard	
CC.2.4.HS.B.1 - Summarize, represent, and interpret data on a single count or measurement variable.	
Taught in Unit(s)	
Collecting and Displaying Data Exploring Data	
Explanation/Example of Standard	
• Determine a measure of center for data • Determine a measure of variation for data • Represent data graphically	
Common Misconceptions	
• Cannot average averages • Scales in graphical representations can be misleading	
Big Idea(s)	**Essential Question(s)**
• Mathematical relationships among numbers can be represented, compared, and communicated • Data can be modeled and used to make inferences	• How can data be organized and represented to provide insight into the relationship between quantities? • How does the type of data influence the choice of display?
Assessments	
See file for specific unit common assessments.	
Concepts (what students need to know)	**Skills** (what students must be able to do)
• Measures of Central Tendency • Measures of Variation • Graphical Representations: Line Graph, Line/Dot Plot, Box and Whisker, Stem and Leaf, Bar Graph, Histogram, Pie Chart, Cumulative Frequency • Skewed vs. Symmetric Distributions • Empirical Rule • Normal Distribution	• Calculate a Mean, Median, Mode • Calculate Measures of Variation: Range, Standard Deviation, Variance • Determine a measure of center for data • Determine a measure of variation for data • Represent data graphically