SASD Curriculum Map Content Area:_Mathematics Course:_Introduction Probability & Statistics

UNIT Title/Focus	**Pre-Chapter – Writing decimals, percents, fractions**	**TIME OF YEAR/LENGTH** *(E.G. Oct-Nov/3 weeks)*	**September – Mid September / 2 Weeks**
DRIVING QUESTION(S)	**How can decimals change to percents? Change to fractions? How does money deal with percent increase and decrease?**		
CONTENT VOCABULARY	**Percent, Decimal, Fraction, Percent Increase/Decrease, Original Amount, New Amount, Relative Frequency**		

TOPIC	ELIGIBLE CONTENT/ STANDARDS	OBJECTIVES	ASSESSMENT	RESOURCES
Understanding Numbers	CC.2.2.HS.D.2, CC.2.2.HS.D.9, CC.2.1.HS.F.5	Write numbers as decimals, percents, fractions. Solve percents of questions by writing equations.	Quiz Pre 1	TI-84 Calculators, Microsoft Excel
Altering Values, Percents of, Increase / Decrease	CC.2.2.HS.D.2, CC.2.2.HS.D.9, CC.2.1.HS.F.5	Find the percent increase or decrease of two numbers. Find original price or final price based on given information.	Quiz Pre 2. Pre-Chapter Test	TI-84 Calculators, Microsoft Excel

SASD Curriculum Map Content Area:_Mathematics Course:_Introduction Probability & Statistics

UNIT Title/Focus	**Chapter 1 – Working with Univariate and Bivariate Categorical Variables**	**TIME OF YEAR/LENGTH** *(E.G. Oct-Nov/3 weeks)*	**Mid September – Early October / 3 Weeks**
DRIVING QUESTION(S)	**What is a categorical variable and what can be done with it? How can categorical variables be represented? How can one variable depend on another variable?**		
CONTENT VOCABULARY	**Relative Frequency, Bar Graph, Contingency Table, Circle (Pie) Chart, Segmented Bar Graphs, Nominal, Ordinal, Interval, Ratio.**		

TOPIC	ELIGIBLE CONTENT/ STANDARDS	OBJECTIVES	ASSESSMENT	RESOURCES
Identify Variables by Type	CC.2.4.HS.B.1	Identify a variable by nominal, ordinal, interval, ratio. Find relative frequency from a frequency table. Answer basic questions regarding probability using relative frequency.		Textbook and TI-84 Calculators
Construct Charts for Single Categorical Variables	CC.2.4.HS.B.1, CC.2.1.HS.F.3	Construct either a horizontal or vertical bar graph using either frequency or relative frequency. Construct a labeled pie chart using a protractor. Answer basic questions using the categorical displays.	Quiz on bar and circle graphs	Textbook and TI-84 Calculators. Microsoft Excel.
Construct Charts for Two Categorical Variables	CC.2.4.HS.B.2, CC.2.4.HS.B.5-6, CC.2.1.HS.F.3	Construct a relative frequency, row relative frequency, or column relative frequency contingency table. Construct a segmented bar graph from a RRF or CRF. Determine whether or not two variables are dependent by looking at the graphs as well as calculating probabilities.	Quiz on contingency tables. Test Chapter 1.	Textbook and TI-84 Calculators

SASD Curriculum Map Content Area:_Mathematics Course:_Introduction Probability & Statistics

UNIT Title/Focus	**Chapter 2 – Working with Univariate Quantitative Variables**	**TIME OF YEAR/LENGTH** *(E.G. Oct-Nov/3 weeks)*	**Early October – Early November / 4 Weeks**
DRIVING QUESTION(S)	**What is a quantitative variable and what can be done with it? How can quantitative variables be represented in a graph? What can be done numerically with quantitative variables?**		
CONTENT VOCABULARY	**Discrete Random Variable, Continuous Random Variable, Mean, Median, Mode, Range, IQR, Standard Deviation, Relative Frequency, Dotplot, Stem-and-Leaf, Histogram, Box and Whisker**		

TOPIC	ELIGIBLE CONTENT/ STANDARDS	OBJECTIVES	ASSESSMENT	RESOURCES
Identify Variables by Type	CC.2.4.HS.B.1	Identify interval and ratio variables. Decide whether or not the variable is discrete or continuous. Place values in a calculator and find one variable statistics (mean, median, mode, range, IQR, standard deviation). Find relative frequency from a frequency table.	Quiz on identifying variables and listing one variable statistics	Textbook and TI-84 Calculators
Construct Charts for Single Quantitative Variables	CC.2.1.HS.F.3, CC.2.4.HS.B.1, CC.2.4.HS.B.2	Construct all types of quantitative graphs both by hand and when applicable, with the calculator: This includes**,** dotplot, stem-and-leaf, histogram, and box and whisker.	Quiz on univariate quantitative graphs	Textbook and TI-84 Calculators. Microsoft Excel.
Compare Quantitative Variables Distributed Across Categories	CC.2.1.HS.F.3, CC.2.4.HS.B.1, CC.2.4.HS.B.2	Construct stacked univariate distributions when grouped by outcomes of a categorical variable.	Quiz on contingency tables. Test Chapter 2.	Textbook and TI-84 Calculators

SASD Curriculum Map Content Area:_Mathematics Course:_Introduction Probability & Statistics

UNIT Title/Focus	**Chapter 3 – Working with Bivariate Quantitative Variables**	**TIME OF YEAR/LENGTH** *(E.G. Oct-Nov/3 weeks)*	**Early November – Late November / 3 Weeks**
DRIVING QUESTION(S)	**How can we visualize an association between two quantitative variables? If an association exists, how can we create a mathematical model (equation) that can make relatively accurate predictions?**		
CONTENT VOCABULARY	**Independent and Dependent Variables, Line of Best Fit, Least Squares Regression Line, Interpolation, Extrapolation, Correlation, Weak-Moderate-Strong Association.**		

TOPIC	ELIGIBLE CONTENT/ STANDARDS	OBJECTIVES	ASSESSMENT	RESOURCES
Sketching Scatterplots and create Line of Best Fit for predictions	CC.2.1.HS.F.3, CC.2.4.HS.B.2, CC.2.4.HS.B.3, CC.2.4.HS.B.5, CC.2.2.HS.C.2, CC.2.2.HS.C.6	Accurately construct a scatterplot to scale. State both strength and direction of an association. Produce similar results in a calculator. Algebraically calculate a Line of Best Fit using two points (slope and y-intercept). Make simple predictions using the LOBF.	Quiz and group project	Textbook and TI-84 Calculators
Least Squares Regression Line and Residuals	CC.2.1.HS.F.3, CC.2.4.HS.B.2, CC.2.4.HS.B.3, CC.2.4.HS.B.5, CC.2.2.HS.C.2, CC.2.2.HS.C.6	Use the calculator (as well as formulas) to find the Least Squares Regression Line. Compare The LSRL to the LOBF. Discuss residuals, what they mean, and how to construct a residual scatterplot.	Quiz, more group projects, Test Chapter 3.	Textbook, TI-84 Calculators, and Excel

SASD Curriculum Map Content Area:_Mathematics Course:_Introduction Probability & Statistics

UNIT Title/Focus	**Chapter 4 – Simulation, Sampling, and Study Design**	**TIME OF YEAR/LENGTH** *(E.G. Oct-Nov/3 weeks)*	**Late November – Early January / 4 Weeks**
DRIVING QUESTION(S)	**How can a simulation model reality and games? What can be used in a simulation? Why do we take samples from populations? How can sampling go horribly wrong? When not sampling, what characteristics constitute a well-developed, representative study? How and why do we randomize? What**		
CONTENT VOCABULARY	**Simulation, Randomization, Sample, Population, Sampling, SRS, Systematic, Stratified, Cluster, Multistage, Bias (response and nonresponse), Sampling Error (variability), Observational Study, Simple Experimental Design, Blocking, Matched Pairs, Statistically Significant, Blinding, Placebo**		

TOPIC	ELIGIBLE CONTENT/ STANDARDS	OBJECTIVES	ASSESSMENT	RESOURCES
Simulation Methods and Understanding Randomness	CC.2.4.HS.B.4	Simulate real world events using objects (dice, cards, and spinners), random number tables, and technology (calculator, random number generator). Discuss what probability means in context to simulation.	Simulation Quiz	Textbook and TI-84 Calculators
Sampling and Bias	CC.2.4.HS.B.4, CC.2.4.HS.B.5	Discuss different sampling methods that could be used to construct a representative sample from a population. Discuss how bias will always play a role in sampling, and how it can be limited.	Sampling Quiz and group activity	Textbook and TI-84 Calculators
Study Design and Best Practices	CC.2.4.HS.B.4, CC.2.4.HS.B.5	If possible, construct all three types of study designs for a given scenario, discussing advantages and disadvantages for each. Understand the cause and effect relationship of experimentation, and differentiate among experiments and observational studies	Study Design Quiz, group activity, and Test Chapter 4	Textbook and TI-84 Calculators

SASD Curriculum Map Content Area:_Mathematics Course:_Introduction Probability & Statistics

UNIT Title/Focus	**Chapter 5 – Probability**	**TIME OF YEAR/LENGTH** *(E.G. Oct-Nov/3 weeks)*	**Late January – Mid February / 3 Weeks**
DRIVING QUESTION(S)	**What are the basic rules to probability, and how do I apply these rules to the world? What can I use (Venn Diagram, charts) to help me grasp probability? How can contingency tables help me solve problems involving conditional probability? Am I able to look for association and dependencies among categorical variables using probability?**		
CONTENT VOCABULARY	**Sample Space, Element, Component, Trial, Formal Probability, Venn Diagram, Additional Rule, Multiplication Rule, Independent, Mutually Exclusive, Conditional Probability, Bayes Rule, Tree Diagram**		

TOPIC	ELIGIBLE CONTENT/ STANDARDS	OBJECTIVES	ASSESSMENT	RESOURCES
Basic Probability Rules and Venn Diagrams	CC.2.4.HS.B.1, CC.2.4.HS.B.7	Understand the formal aspects and rules to finding basic probability. Group outcomes together and display possible outcomes using Venn Diagrams. Use both the addition and multiplication rules to find the likelihood of possible outcomes	Venn Diagram Quiz	Textbook and TI-84 Calculators
Contingency Tables and Segmented Bar Graphs	CC.2.4.HS.B.1, CC.2.4.HS.B.6, CC.2.4.HS.B.7	Construct and interpret a contingency table to both find probabilities and look for associations among variables. Use formulas to find probabilities, and use those probabilities to construct segmented bar graphs	Contingency Table Quiz	Textbook and TI-84 Calculators
Tree Diagrams and Constructing Probability Tables	CC.2.4.HS.B.1, CC.2.4.HS.B.6, CC.2.4.HS.B.7	Construct probability charts and tree diagrams that show either dependent events or multiple events. Calculate probabilities using formulas	Probability Test Chapter 5	Textbook and TI-84 Calculators

SASD Curriculum Map Content Area:_Mathematics Course:_Introduction Probability & Statistics

UNIT Title/Focus	**Chapter 6 – Counting Principles, Combinations, and Permutations**	**TIME OF YEAR/LENGTH** *(E.G. Oct-Nov/3 weeks)*	**Mid February – Early March / 2 Weeks**
DRIVING QUESTION(S)	**How can combinations and permutations play a role in find the number of possible outcomes in given scenarios? How can I distinguish between the two, and when should I use one or the other? How do possible outcomes relate to probability?**		
CONTENT VOCABULARY	**Combination, Permutation, Factorial, Multiplication Rule, Tree Diagram of Possible Outcomes**		

TOPIC	ELIGIBLE CONTENT/ STANDARDS	OBJECTIVES	ASSESSMENT	RESOURCES
Counting Principle	CC.2.2.HS.D.2, CC.2.2.HS.D.9, CC.2.4.HS.B.1, CC.2.1.HS.F.3	Use both tree diagrams as well as the counting principle to find total number of outcomes with multiple decisions	Counting Principle Quiz	Textbook and TI-84 Calculators
Factorials and Permutations	CC.2.2.HS.D.2, CC.2.2.HS.D.9, CC.2.4.HS.B.1	Identify situations that use permutations and find the total number of possible outcomes when selecting without replacement when order of selection matters		Textbook and TI-84 Calculators
Combinations and Probability	CC.2.2.HS.D.2, CC.2.2.HS.D.9, CC.2.4.HS.B.1	Identify situations that use combinations and find the total number of possible outcomes when selecting without replacement when order of selection doesn't matter. Extend counting principles to probability	Counting Principles Test Chapter 6	Textbook and TI-84 Calculators

SASD Curriculum Map Content Area:_Mathematics Course:_Introduction Probability & Statistics

UNIT Title/Focus	**Chapter 7 – Expected Value and Game Theory**	**TIME OF YEAR/LENGTH** *(E.G. Oct-Nov/3 weeks)*	**Early March – Late March / 3 Weeks**
DRIVING QUESTION(S)	**How can simple games of chance incorporate value to make them more entertaining? How can we model real world issues using the concept of expected value and risk / reward? What does expected value and standard deviation mean in context to a discrete random variable? How do I make a game "fair", and what does it mean?**		
CONTENT VOCABULARY	**Discrete Random Variable, Expected Value Table, Expected Value, Standard Deviation, Fair**		

TOPIC	ELIGIBLE CONTENT/ STANDARDS	OBJECTIVES	ASSESSMENT	RESOURCES
Simple Games	CC.2.4.HS.B.1, CC.2.4.HS.B.4, CC.2.4.HS.B.7	Understand the primary rules of gaming, how to create a tree diagram of outcomes, and fill in probabilities. One table is created, find expected value by hand and using a calculator	Simple Gaming Quiz and group project	Textbook and TI-84 Calculators
Decision Making	CC.2.4.HS.B.1, CC.2.4.HS.B.4, CC.2.4.HS.B.7	Extend gaming rules into real world decision making and risk taking; insurance, crime, best practices, gambling, etc.	Decision Quiz	Textbook and TI-84 Calculators
Understanding Expected Value, Fairness, and Standard Deviation	CC.2.4.HS.B.1, CC.2.4.HS.B.4, CC.2.4.HS.B.5, CC.2.4.HS.B.7	Identify a discrete random variable scenario that has attached value and use probabilities rules to not only construct a table to calculate expected value, but use other calculations to make intelligent decisions about possible choices	Counting Principles Test Chapter 6	Textbook and TI-84 Calculators

SASD Curriculum Map Content Area:_Mathematics Course:_Introduction Probability & Statistics

UNIT Title/Focus	**Chapter 8 – Binomial and Geometric Distributions**	**TIME OF YEAR/LENGTH** *(E.G. Oct-Nov/3 weeks)*	**Late March – Late April / 3 Weeks**
DRIVING QUESTION(S)	**What conditions must be met for either the Binomial or Geometric models to be applied? How are both distributions examples of Bernoulli Trials? How can we distinguish among the different distributions? How can technology make calculations remarkably simpler?**		
CONTENT VOCABULARY	**Bernoulli Trial, Success, Failure, Set Trials, Binomial, Geometric, "first success", Histogram, Probability Distribution, Expected Value**		

TOPIC	ELIGIBLE CONTENT/ STANDARDS	OBJECTIVES	ASSESSMENT	RESOURCES
Bernoulli Trials and Identifying Characteristics	CC.2.4.HS.B.1, CC.2.4.HS.B.4, CC.2.4.HS.B.7	Understand the rules of Bernoulli Trials, how they fit into discrete distributions, and how Binomial and Geometric go a few steps further		Textbook and TI-84 Calculators
Binomial Distributions	CC.2.1.HS.F.3, CC.2.1.HS.F.4, CC.2.4.HS.B.1, CC.2.4.HS.B.4, CC.2.4.HS.B.7	Identify characteristics of binomial distributions, construct a histogram, and calculate probabilities with both a formula as well as the calculator. Make basic decisions based on likelihood of outcomes	Binomial Distribution Quiz	Textbook and TI-84 Calculators
Geometric Distributions	CC.2.1.HS.F.4, CC.2.4.HS.B.1, CC.2.4.HS.B.4, CC.2.4.HS.B.7	Differentiate among binomial and geometric distributions, construct a histogram for first successes, and calculate probabilities with both the formula as well as the calculator	Binomial and Geometric Distribution Test Chapter 8	Textbook and TI-84 Calculators

SASD Curriculum Map Content Area:_Mathematics Course:_Introduction Probability & Statistics

UNIT Title/Focus	**Chapter 9 – Normal Distributions and Sampling Distributions**	**TIME OF YEAR/LENGTH** *(E.G. Oct-Nov/3 weeks)*	**Late April – Mid May / 2 to 3 Weeks**
DRIVING QUESTION(S)	**How are continuous random variables different from discrete random variables? What types of real world phenomena fit the normal distribution? How does the Central Limit Theorem use both real world events and the normal model together?**		
CONTENT VOCABULARY	**Continuous Random Variable, Population Mean, Population Standard Deviation, Normal Model, Standardized z-score, Lower and Upper Bounds, Sampling Distribution, Sample Size, Central Limit Theorem, Empirical Rule**		

TOPIC	ELIGIBLE CONTENT/ STANDARDS	OBJECTIVES	ASSESSMENT	RESOURCES
Continuous Random Variables and the Normal Model	CC.2.1.HS.F.3, CC.2.2.HS.C.6, CC.2.4.HS.B.1, CC.2.4.HS.B.7	Identify a variable that is continuous. Draw a normal model with three standard deviations above and below the mean. Discuss the Empirical (68-95-99.7 rule). Standardize x values and find probabilities in a calculator	Quiz on Normal Model and Empirical Rule	Textbook and TI-84 Calculators
Standardizing and Unstandardizing Normal Distributions	CC.2.1.HS.F.3, CC.2.2.HS.C.6, CC.2.4.HS.B.1, CC.2.4.HS.B.7	Use a formula to both standardize and unstandardized values. Go from an x to a probability and vice versa. Use a "reverse look up" using both the calculator and a probability table	Standardizing Quiz	Textbook and TI-84 Calculators
Sampling Distribution	CC.2.1.HS.F.3, CC.2.2.HS.C.6, CC.2.4.HS.B.1, CC.2.4.HS.B.6, CC.2.4.HS.B.7	Understand the concepts behind sampling distributions and the Central Limit Theorem. Use a formula to find probabilities of samples larger than size n=1. Make conjectures about the likelihood of certain events.	Sampling Distribution Quiz and group activity. Test on the Normal Model Chapter 9	Textbook and TI-84 Calculators

SASD Curriculum Map Content Area:_Mathematics Course:_Introduction Probability & Statistics

UNIT Title/Focus	**End of Year Review**	**TIME OF YEAR/LENGTH** *(E.G. Oct-Nov/3 weeks)*	**Mid to Late May – Early June / 1 to 2 Weeks**	
TOPIC	**ELIGIBLE CONTENT/ STANDARDS**	**OBJECTIVES**	**ASSESSMENT**	**RESOURCES**
Review of Chapters 1-9	All Standards above	Complete review packets and graph underlying connections among all content learned in statistics this year.	Final Exam	Textbook and TI-84 Calculators