Mt. Zion High School Curriculum Map

Name:__Vickie Marshall_____Department:__Math_____Subject:__Probability & Statistics_____

Quarter	Essential Skills	Strategies and Activities	CC Standards	Assessments
1	1a. Students will demonstrate knowledge of statistical terms. They will be able to explain how statistics can be used and misused.	1a. Students will learn basic definitions and identify different types of statistics.	9-12 S-IC.3	1a. Homework, Definition Quiz, Glyph Project, Review Game, Ch. 1 Test
		1b. Students will demonstrate their understanding of the different types of statistics by bringing in articles that represent each kind.	9-12 S-IC.3	1b. Cut out and label statistics from newspapers and magazines
1	2a. Students will be able to organize and interpret data with charts, tables, and graphs.	2a. Students will display data by constructing histograms, bar, Pareto, and time series graphs. They will also display statistics with stem and leaf and box and whisker plots.	9-12 S-ID.1-3	2a. Homework, Graph Quiz, Review Game, Ch. 2 Test
		2b. Students will collect and analyze fast food data and recommend where to buy a particular fast food item based on the fat, carbohydrates, size, and calorie data.	9-12 S-ID.2-3	2b. Create a PowerPoint presentation of fast food findings and recommendations
1	3a. Students will be able to describe data by finding measures of central tendency, variation, and position and understand the importance of each.	3a. Students will do an activity that shows where different measures of center should be used. Students will understand how measures of position will help them see how their test results compare with others; important information for those applying for jobs and college.	9-12 S-ID.3	3a. Homework, Quizzes on measures of center, variation, and position, Review Game, Ch. 3 Test
		3b. The cubit demonstration will help students realize the importance of measuring variations.	9-12 S-ID.4	3b. Cubit Activity

Quarter	Essential Skills	Strategies and Activities	CC Standards	Assessments
2	4a. Students will learn the basic concepts of probability and be able to determine the probability of given events.	4a. Students will do experiments with coins, dice, cards, and games to discover and understand the rules of probability.	9-12 S-IC.2	4a. Homework, Quizzes, Review Game, Ch. 4 Test
	4b. Students will learn and understand the addition, multiplication, counting, and conditional probability rules and when to apply them.	4b. Students will memorize the probability rules after understanding them through the use of concrete examples.	9-12 CP.1-9	4b. Homework, Quizzes, Digit Game, Ch. 4 Test
		4c. Students will watch a video about the explosion of the Challenger to understand how conditional probability related to the accident. Real life examples of probability will be shared.	9-12 S-CP.3-5	4c. Paragraph essay explaining conditional probability related to the Challenger accident
2	5a. Students will understand how to find probability by using discrete probability distributions, which include the binomial, multinomial, Poisson, and hypergeometric distributions.	5a. Students will learn how to use the TI-84+ or TI-Inspire calculators to find probability using the appropriate distribution technique.	9-12 S-MD.1-4	5a. Homework, Quizzes, Group Work, Review Game, Ch. 5 Test, Prob Fair
		5b. A Numbers TV Show video will be shown that illustrates how the FBI uses statistics to solve a case.	9-12 S-CP.7.8	5b. Write essay describing use of probability in the show
		5c. Find the expected value by playing “Is This Game Fair?”	9-12 S-MD.1-5a	5c. Alter aspects of the game and have students find the new expected value, Homework
		5d. Students will work in groups to design a carnival type game in order to teach probability to Mt. Zion Grade students. They will take a field trip from school to administer the Prob Fair for the entire student body of Mt. Zion Grade School.	9-12 S-CP.7,8	5d. Probability Fair Project which involves creating, building, and administrating games at the Mt. Zion Grade School to teach children probability

2	6a. Students will understand the importance of the Normal Distribution and its applications to real life probability.	6a. Students will solve problems involving the normal distribution on their calculators.	9-12 S-ID.4,5	6a Homework, Quizzes, Group Work, Review Game, Ch. 6 Test
	6b. Students will be able to use the inverse Normal Distribution method to find a specific score from a given probability.	6b. Students will solve problems using the invNorm function on their calculator.	9-12 S-ID.4	6b. Same as 6a
	6c. Students will learn the Central Limit Theorem and its applications.	6c. Students will learn the Central Limit Theorem by analyzing student heights and comparing row samples and the class population.	9-12 S-IC.1	6c. Same as 6a
2	7a. Review all material in Chs. 1 – 6 and their practical applications.	7a. Students will work in groups filling out a review sheet covering chapters 1 – 6	All of the above listed standards	7a. Homework, Review Game, 1st Semester Exam
3	7b. Students will learn what a confidence interval is and how to find the interval for the mean, proportions, variances, and standard deviations.	7b. Students will write down their weight on a piece of paper and then guess the average class weight. We will find the average weight and discuss how our confidence in the answer would improve if we had an interval instead of an exact point to guess.	9-12 S-IC.1	7b. Homework
		7c. Students will learn how to compute the confidence intervals for the mean, proportions, variances, and standard deviations with and without their calculators.	9-12 S-IC.1	7c. Homework, Quiz, Ch.7 Test
3	8a. Students will learn the importance of Hypothesis Testing	8a. Students will learn the 5 step traditional method of hypothesis testing and be able to do the work with and without a calculator.	9-12 S-IC.1	8a. Homework, Quiz
	8b. Students will use z and t Tests for testing the hypothesis of the mean.	8b. Students will use the hypothesis testing method for finding the z and t test for the mean with and without a calculator.	9-12 S-IC.1	8b. Same as 8a
	8c. Students will use the z Test for a proportion.	8c. Students will use the 1Prop Z-Test in their calculators to compare proportions.	9-12 S-IC.1	8c. Same as 8a

3	9a. Students will test the difference between two means using the z Test.	9a. Students will use their calculators and the five step hypothesis testing method for the two means z Test of large samples.	9-12 S-IC.1	9a. Homework
	9b. Students will test the difference between two independent samples using the t Test.	9b. Students will use the two sample z Test on their calculators and hypothesis testing methods to test for the independence of small samples.	9-12 S-IC.5	9b. Homework, Quiz, Test the difference between Probability Classes test scores
	9c. Students will test the difference between proportions using the p-value.	9c. Use the 2-Proportion z-Test in calculator to solve problems.	9-12 S-IC.5	9c. Homework
	9d. Students will test the difference between two variances using the F Test.	9d. Use the 2-Sample F Test in the calculator to solve problems.	9-12 S-IC.5	9d. Homework, Ch. 9 Review, Ch. 9 Tests
3	10a. Students will learn the connection between scatter plots and correlation.	10a. Students will graph test scores from music, reading, and math to compare and contrast the graphs and to discover the concept of correlation.	9-12 S-ID.6,9	10a. Students will be able to identify +, -, or 0 correlation by looking at a graph and write three sentences to exemplify these types
	10b. Students will learn how to find the regression line for a set of data and to decide if the correlation is significant.	10b. Students will use the stat plot feature on their calculator to graph data sets, calculate the line of best fit, and determine if the given data correlates.	9-12 S-ID.8	10b. Homework, Quiz
	10c. Students will study formulas involving multiple regressions.	10c. Students will use the equation of the regression line to predict y values for given x values. Students will select two sets of quantifiable data to see if they correlate.	9-12 S-ID.6c,7,8,9	10c. Homework, Correlation Project, Ch. 10 Review and Test
4	11a. Students will be introduced to the Chi-Squared Goodness of Fit test.	11a. Students will share what they think the twenty top discoveries of the 20^{th} century were. They will find out that one of them was the development of the Chi-Square Test.	9-12 S-MD.4	11a. Homework
	11b. Students will determine independence of data using the Chi-	11b. Students will use matrices and the Chi-Squared Test on the calculator to test for	9-12 S-MD.4	11b. Homework, Quiz, Ch. 11 Review and Test

	Square Test.	independence.		
	11c. Students will choose a topic to see if there is a favorite item by using the Chi-Squared Test.	11c. We will do the "Chocolate Chip Cookie Experiment" to see if students have a favorite chocolate chip cookie. This experiment will demonstrate to students how to do the Chi-Square project.	9-12 S-MD.4	11c. Chi-Square Project
4	12a. Students will learn what ANOVA stands for and why it is useful.	12a. Students will learn that ANOVA stands for ANalysis Of VAriance. We will work an example problem to demonstrate the method and usefulness of the technique.	9-12 S-ID.5	12a. Homework
	12b. Students will learn how to use the calculator to run the ANOVA test.	12b. Students will work calculator problems together in class.	9-12 S-ID.5	12b. Homework, Quiz, Ch. 12 Test
4	13a. Students will learn the definition of nonparametric statistics and their advantages and disadvantages.	13a. Students will do the single-sample and paired-sample sign tests. We will look at before and after ACT prep test scores.	None	13a. Homework
	13b. Students will use ranks to do nonparametric tests.	13b. Students will work problems and learn how to use the Wilcoxon Rank Sum Test, the Wilcoxon Signed-Rank Test, the Kruskal-Wallis Test, and the Spearman Rank Correlation Coefficient Test.	None	13b. Homework, Quiz
	13c. Students will learn how to test for randomness.	13c. Students will be sent in groups throughout the school to collect data for the Runs Test. We will use this data to demonstrate how to test for randomness.	None	13c. Homework, Runs Test, Quiz
	14a. Students will learn about the common sampling techniques.	14b. Students will take turns role playing sampling techniques while fellow classmates identify the type.	9-12 S-IC.3	14a. Homework, Role Play
	14b. Students will learn about questionnaire design.	14b. Students will watch a video of a man on the street asking survey questions. He will display incorrect methods of questioning. These methods will be discussed.	9-12 S-IC.3	14b. Students will be given survey questions to identify as correct or incorrect and will fix incorrect questions.

4	14c. Students will learn about simulation techniques and the Monte Carlo Method.	14c. Students will watch an excerpt from the "Let's Make a Deal" and the "Numbers" TV shows. We will learn about the famous Monty Hall problem and we will use a simulation to decide if we should "stick or switch". Then we will look at the formula.	9-12 S-IC.2	14c. Students will solve homework problems using the Monte Carlo Method and the Probability Simulator on their calculators; Quiz
	14d. Students will learn how to correctly apply sampling techniques and questionnaire design through the "Survey Project.	14d. Students will work in groups to pick a survey topic, write at least ten questions, survey a sample of 100 or more, tally the surveys, summarize the results, and make a PowerPoint slideshow of the project information with graphs of the results.	9-12 S-IC.1,2,3,6	14d. PowerPoint Presentation of Survey Project
	15a. Review Probability and Statistics book with an emphasis on Second Semester.	15a. Work through review sheet over chapters 8 – 14. Discuss topics.	All of the above listed standards.	15a. 2nd Semester Exam