Algebra I	Unit 1: Expressions and Equations (Ch. 1-3)		Suggested Length: Semester Course: 4 weeks Year Course: 8 weeks
Essential Questions	***Program of Studies* and Core Content**	**Key Terms and Vocabulary**	**Classroom Instruction and <u>Assessment</u>** *Student will:*
1. How can I use and evaluate algebraic expressions in relation to real-world applications? 2. How can I use real numbers to solve real-world problems? 3. How can I use linear equations to solve real-world problems? 4. How can I use linear inequalities to solve real-world problems? 5. How do I analyze statistical information represented in the real world?	<u>**Program of Studies**</u> ❑ *M-H-A-1 Solve one-variable equations using manipulative, symbols, procedures, and graphing.* ❑ *M-H-A-2 Solve two-variable linear equations using real numbers, real number operations, field properties, and order of operations.* ❑ *M-H-A-11 Write and solve proportion sentences* ❑ *M-H-A-12 Use proportional reasoning (ratios and proportions) to solve real-world problems.* <u>**Core Content**</u> ❑ MA-HS-1.1.1 Students will compare real numbers using order relations (less than, greater than, equal to) and represent problems using real numbers ❑ MA-HS-1.1.2 Students will demonstrate the relationships between different subsets of the real number system. ❑ **MA-HS-1.3.1 Students will solve real-world and mathematical problems to specified accuracy levels by simplifying expressions with real numbers involving addition, subtraction, multiplication, division, absolute value, integer exponents, roots (square, cube), and factorials. DOK 2** ❑ MA-HS-1.5.1 Students will identify real number properties (commutative properties of addition and multiplication, associative properties of addition and multiplication, distributive property of multiplication over addition and subtraction, identity properties of	❑ Identity ❑ Absolute value ❑ Proportion ❑ Ratio ❑ Reciprocal ❑ Commutative ❑ Associative ❑ Exponents ❑ Closure ❑ Distribute ❑ Inverse ❑ Slope	❑ Determine the profit made from the sales of several products, given the cost, price, and quantity sold. DOK 3 ❑ Create a verbal expression describing a real-world situation based on data given in a chart. Write an algebraic expression that represents the situation and solve by applying the order of operations. DOK 3 ❑ Formulate several open sentence equations and inequalities. Trade open sentences with a partner to have him/her solve. Grade each other's work in order to assess knowledge of this topic. DOK 3 ❑ Choose three graphs from print resources, and identify whether or not the graphs are misleading. Interpret and analyze the data and explain why the graphs are or are not misleading. DOK 3 ❑ Write an inequality and graph it on a number line. Submit a written explanation of the steps he/she took in order to graph your inequality. DOK 4 ❑ Choose a product advertised in video or print media and investigate on-line to find the cost of that product. Write an equation to determine the amount of that product the student can purchase, given a specific budget, solve the equation and check the answer by

Algebra I	Unit 1: Expressions and Equations (Ch. 1-3)		Suggested Length: Semester Course: 4 weeks Year Course: 8 weeks
Essential Questions	***Program of Studies* and Core Content**	**Key Terms and Vocabulary**	**Classroom Instruction and <u>Assessment</u>** *Student will:*

	addition and multiplication and inverse properties of addition and multiplication) when used to justify a given step in simplifying an expression or solving an equation.
	
	❑ MA-HS-1.5.2 Students will use equivalence relations (reflexive, symmetric, transitive).
	
	❑ **MA-HS-5.1.5 Students will:**
	   ❑ **determine if a relation is a function;**
	   ❑ **determine the domain and range of a function (linear and quadratic);**
	   ❑ **determine the slope and intercepts of a linear function;**
	   ❑ **determine the maximum, minimum, and intercepts (root/zero) of a quadratic function and**
	   ❑ **evaluate a function written in function notation for a specified rational number. DOK 2**
	
	❑ **MA-HS-5.2.1 Students will apply order of operations, real number properties (identity, inverse, commutative, associative, distributive, closure), and rules of exponents (integer) to simplify algebraic expressions. DOK 1**
	
	❑ **MA-HS-5.3.1 Students will model, solve and graph first degree single variable equations and inequalities including absolute value based in real-world and mathematic problems and graph the solutions on a number line. DOK 2**
	
	❑ MA-HS-5.3.2 Students will solve for a specified variable in a multivariable equation.
			working backwards.
			❑ Organize a given set of numbers into their appropriate subset using a Venn diagram. Describe why each number belongs in its particular subset. DOK 4
			❑ Verbally describe the relationship between two variables represented on a coordinate system DOK 2
			❑ Make predictions, based on the relationship between dependent and independent variables. DOK 3
			❑ Identify from a choice, which graph most accurately describes a particular real-world situation. Examples include the speed of a bus as it moves along its route or the temperature of a pan of water as it is brought to a boil.
			❑ Graphically describe a similar real-world scenario. DOK4
			❑ Use a proportion to determine how far one could travel in different amounts of time, given a particular speed in miles per hour. DOK 4
			❑ Visit a retail store, choose a product that is on sale, and determine what the cost of that item would be after the sale discount and tax are applied. Show all work and quote the final price of the item and the percent of change from the original price.
			❑ Use deductive reasoning to determine whether a conditional statement is true or false, and if false, provide a counterexample. DOK 4
			❑ Identify different types of graphs (line, circle, and bar) and determine which is best suited to display different sets of data or types of situations.
			❑ Support skills by dividing into teams and playing Jeopardy to review.
			❑ <u>Daily Homework Questions from resource study guide, practice RTLM, skills practice</u>
			❑ <u>Resource Masters Skills Practice Worksheets</u>
			❑ <u>Mid-Chapter Quizzes Including Key Term Vocabulary with Multiple Choice Applications</u>
			❑ <u>End of Chapter Tests Including Key Term Vocabulary, Multiple Choice Applications, and Open Response Questions with Rubric</u>

Algebra I	Unit 1: Expressions and Equations (Ch. 1-3)		Suggested Length: Semester Course: 4 weeks Year Course: 8 weeks
Essential Questions	***Program of Studies* and Core Content**	**Key Terms and Vocabulary**	**Classroom Instruction and <u>Assessment</u>** *Student will:*
			❑ <u>Bell work assessments from the text</u>

Algebra I	Unit 2: Linear Functions (Ch. 4-7)		Suggested Length: Semester Course: 5 weeks Year Course: 10 weeks
Essential Questions	***Program of Studies* and Core Content**	**Key Terms and Vocabulary**	**Classroom Instruction and <u>Assessment</u>** *Student will:*
1. How do I recognize geometric/arithmetic sequences used in real-world situations? 2. How can I use inequalities to represent various real-world problems? 3. How can I model and predict real-life events using linear equations? 4. How do I apply direct and inverse variation to real-world problems?	<u>**Program of Studies**</u> ❑ *M-H-A-3 Write and solve linear sentences, describing real-world situations by using and relating formulas, tables, graphs, and equations.* ❑ *M-H-A-4 Use characteristics of the graphs of linear functions, such as slope and intercepts, transformations.* ❑ *M-H-A-5 Collect, organize, and display two-variable data, and use a line of best fit as a model to predict.* ❑ *M-H-A-6 Connect the skills to solve linear equations to solve linear inequalities* ❑ *M-H-A-7 Write and solve linear inequalities.* ❑ *M-H-A-9 Collect, organize, and display two-variable data, and use a curve of best fit as a model to make predictions.* ❑ *M-H-A-10 Extend ideas of transformations of linear equations, such as vertical and horizontal shifts, to transformations of nonlinear equations* ❑ *M-H-A-13 Solve problems that have direct or inverse relationships for any variable.* ❑ *M-H-A-14 See the patterns in arithmetic sequences and geometric sequences using recursion (formulas expressing each term as a function of one or more of the previous terms).* ❑ *M-H-A-15 See patterns in other sequences (e.g., quadratic, cubic).*		

Algebra I	Unit 2: Linear Functions (Ch. 4-7)		Suggested Length: Semester Course: 5 weeks Year Course: 10 weeks
Essential Questions	***Program of Studies* and Core Content**	**Key Terms and Vocabulary**	**Classroom Instruction and <u>Assessment</u>** *Student will:*
	❑ *M-H-A-16 Relate the patterns in arithmetic sequences to linear equations.* **<u>Core Content</u>** ❑ **MA-HS-1.3.2 Students will:** 　❑ **describe and extend arithmetic and geometric sequences;** 　❑ **determine a specific term of a sequence given an explicit formula;** 　❑ **determine an explicit rule for the nth term of an arithmetic sequence and** 　❑ **apply sequences to solve real-world problems. DOK 3** ❑ MA-HS-1.3.3 Students will write an explicit rule for the nth term of a geometric sequence. ❑ **MA-HS-1.4.1 Students will apply ratios, percents, and proportional reasoning to solve real-world problems (e.g., those involving slope and rate, percent of increase and decrease) and will explain how slope determines a rate of change in linear functions representing real-world problems. DOK 2** ❑ **MA-HS-4.1.2 Students will construct data displays for data with no more than two variables. DOK 2** ❑ **MA-HS-4.2.3 Students will:** 　❑ **identify an appropriate curve of best fit (linear, quadratic, exponential) for a set of two-variable data;** 　❑ **determine a line of best fit equation for a set of linear two-variable data and** 　❑ **apply line of best-fit equations to make predictions within and beyond a given**	❑ Inverse ❑ Slope	❑ Describe the similarities between a coordinate plane and a map. Identify particular locations on a coordinate plane and a map, based on their coordinates and latitude/longitude, respectively. DOK 3 ❑ Compare and contrast linear and non-linear equations and graphical representations, utilizing real-world data. DOK 4 ❑ Identify the domain and range of various sets of data. DOK 2 ❑ Transform figures on a coordinate plane using translations, reflections, dilations, and rotations. ❑ Research some school sporting statistics and formulate relations (ordered pairs, tables, mappings, and graphs) from this data. Find the inverse of these relations. DOK 4 ❑ Choose three graphs representing real-world data from various reliable sources and determine whether they represent a function. ❑ Identify the slope and y-intercept of a linear representation and write an equation of the line in slope-intercept form. Relate the particular line to a real-world situation. DOK 4 ❑ Verbally describe the graphical relationship between a dependent and independent variable. DOK 3 ❑ Graphically describe a verbal relationship between two variables and identify each as dependent or independent. ❑ Recognize, extend, and create arithmetic sequences and write formulas to identify particular sequences. DOK 2 ❑ As a class, list and discuss the types of slopes that one comes across in everyday life. DOK 4 ❑ Make predictions about future values, based on a particular direct variation. Formulate the correct direct variation equation, based on given data. DOK 4 ❑ Choose some real-world data from the Internet to analyze and model using linear equations. Write a

Algebra I	Unit 2: Linear Functions (Ch. 4-7)		Suggested Length: Semester Course: 5 weeks
			Year Course: 10 weeks
Essential Questions	***Program of Studies* and Core Content**	**Key Terms and Vocabulary**	**Classroom Instruction and Assessment**
			Student will:
	set of two-variable data. DOK 3		linear equation in slope-intercept form and point-slope form to model the data. Graph the data and predict the results of future situations using your linear model. DOK 4
	❑ **MA-HS-5.1.1 Students will identify multiple representations (tables, graphs, equations) of functions (linear, quadratic, absolute value, exponential) to solve real-world or mathematical problems. DOK 1**		❑ Interpret points on a scatter plot and write equations for lines of best fit. DOK 2
			❑ Evaluate a scenario based on a scatter-plot.
	❑ MA-HS-5.1.2 Students will identify, relate and apply representations (graphs, equations, tables) of a piecewise function (such as long distance telephone rates) from mathematical or real-world information.		❑ Write, solve, and graph linear inequalities to model real-world situations. DOK 4
			❑ Research the sales of DVDs and VHS tapes. Write a linear equation to model the sales. Graph both equations to represent a system of equations. Find the solution set by graphing and substitution. Find the domain and range of the equation by making a table. Describe the trends and determine possible reasons for the trends. DOK 4
	❑ MA-HS-5.1.3 Students will demonstrate how equations and graphs are models of the relationship between two real-world quantities (e.g., the relationship between degrees Celsius and degrees Fahrenheit).		❑ Choose whether there is one solution, infinitely many, or no solution, given systems of equations, and explain the difference between each of the three graphs. (System of Equations) DOK 2
	❑ MA-HS-5.1.4 Students will recognize and solve problems that can be modeled using an exponential function, such as compound interest problems.		❑ Support skills learned in Unit 2 by dividing into teams and playing Jeopardy to review for Unit 2 Test.
			❑ Daily Homework Questions from the Textbook
			❑ Resource Masters Skills Practice Worksheets
			❑ Resource Masters Standardized Test Practice
	❑ **MA-HS-5.1.5 Students will:**		❑ Mid-Chapter Quizzes Including Key Term Vocabulary with Multiple Choice Applications
	❑ **determine if a relation is a function;**		❑ End of Chapter Tests Including Key Term Vocabulary, Multiple Choice Applications, and Open Response Questions with Rubric
	❑ **determine the domain and range of a function (linear and quadratic);**		
	❑ **determine the slope and intercepts of a linear function;**		❑ Brochure on graphing equations
	❑ **determine the maximum, minimum, and intercepts (roots/zero) of a quadratic function and**		
	❑ **evaluate a function written in function notation for a specified rational number. DOK 2**		
	❑ MA-HS-5.1.6 Students will find the domain		

Algebra I	Unit 2: Linear Functions (Ch. 4-7)		Suggested Length: Semester Course: 5 weeks Year Course: 10 weeks
Essential Questions	***Program of Studies* and Core Content**	**Key Terms and Vocabulary**	**Classroom Instruction and Assessment** *Student will:*
	and range for absolute value functions. ❑ MA-HS-5.1.7 Students will apply and use direct and inverse variation to solve real-world and mathematical problems. ❑ **MA-HS-5.3.1 Students will model, solve and graph first degree single variable equations and inequalities including absolute value based in real-world and mathematical problems and graph the solutions on a number line. DOK 2** ❑ MA-HS- 5.3.2 Students will solve for a specified variable in a multivariable equation. ❑ **MA-HS-5.3.3 Students will model, solve and graph first-degree two-variable equations and inequalities in real-world and mathematical problems. DOK 2** ❑ **MA-HS-5.3.4 Students will model, solve and graph systems of linear equations (two equations in two variables) in real-world and mathematical problems. DOK 3** ❑ MA-HS-5.3.5 Students will write, graph, and solve systems of linear inequalities (two inequalities in two variables) based on real world or mathematical situations and interpret the solution.		

Algebra I	Unit 3: Data Analysis (Ch. 13-14)		Suggested Length: Semester Course: 2 weeks Year Course: 4 weeks
Essential Questions	*Program of Studies* and Core Content	Key Terms and Vocabulary	Classroom Instruction and <u>Assessment</u> *Student will:*

1. How do I identify real-world sampling techniques?
 	
2. How do I interpret and analyze data?
 	
3. How do I find the probability of real-world events?
	<u>**Program of Studies**</u>
	
	❑ ***M-H-A-18 Use strategies such as combinations and permutations (arrangements) to count discrete quantities (the study of mathematical properties of sets and systems that have a countable number of elements).***
	❑ ***M-H-A-19 Design and conduct probability simulations, and interpret the results.***
	
	<u>**Core Content**</u>
	
	❑ **MA-HS-4.1.1 Students will analyze and make inferences from a set of data with no more than two variables and will analyze problems for the use and misuse of data representations. DOK 3**
	
	❑ MA-HS-4.1.3 Students will represent real-world data using matrices and will use matrix addition, subtraction, multiplication (with matrices no larger than 2x2) and scalar multiplication to solve real-world problems.
	
	❑ MA-HS-4.2.2 Students will know the characteristics of the Gaussian normal distribution (bell-shaped curve).
	
	❑ **MA-HS-4.2.3 Students will:**
	  ❑ **identify an appropriate curve of best fit (linear, quadratic, exponential) for a set of two-variable data;**
	  ❑ **determine a line of best fit equation for a set of linear two-variable data and**
	  ❑ **apply line of best fit to make**
			❑ Determine the census, population, and sample from the description of a real-world scenario. Choose whether the sample is biased or unbiased and classify the sample as simple, stratified, systematic, convenience, or voluntary response. DOK 3
			❑ Using matrices, find the total wins, losses, and ties of your favorite local football team. Before beginning, research your favorite team's statistics. DOK 3
			❑ In groups, choose a topic to survey your entire class on. After choosing your topic, create a frequency table and then begin the survey. Create a histogram analyzing the data that has been collected. DOK 3
			❑ Survey each other on a pre-determined subject; find the range, median, lower quartile, upper quartile, interquartile range, and outliers of the data. Create a box-and-whisker plot of the survey. DOK 3
			❑ Find the outcomes of the first five games your high school basketball team is playing by making a tree diagram. List the sample space and total number of outcomes. DOK 3
			❑ Given real-life case scenarios, determine whether their probability represents a permutation or a combination. Find the probability of each by using the formulas for permutations and combinations. DOK 4
			❑ Describe real-world examples of simple, compound, independent, dependent, and mutually exclusive events.

Algebra I	Unit 3: Data Analysis (Ch. 13-14)		Suggested Length: Semester Course: 2 weeks Year Course: 4 weeks
Essential Questions	*Program of Studies* **and Core Content**	**Key Terms and Vocabulary**	**Classroom Instruction and** <u>Assessment</u> *Student will:*

	predictions within and beyond a given set of two-variable data. DOK 3
	
	❑ **MA-HS-4.3.1 Students will recognize potential for bias resulting from the misuse of sampling methods (e.g., non-random sampling, polling only a specific group of people, using limited or extremely small sample sizes) and explain why these samples can lead to inaccurate inferences. DOK 2**
	
	❑ **MA-HS-4.4.1 Students will:**
	  ❑ **determine theoretical and experimental (from given data) probabilities;**
	  ❑ **make predictions and draw inferences from probabilities;**
	  ❑ **compare theoretical and experimental probabilities and**
	  ❑ **determine probabilities involving replacement and non-replacement. DOK 3**
	
	❑ MA-HS-4.4.2 Students will recognize or identify the differences between combinations and permutations and use them to count discrete quantities.
	
	❑ MA-HS-4.4.3 Students will represent probabilities in multiple ways, such as fractions, decimals, percentages, and geometric area models.
		❑ Permutation
		❑ Combination
			DOK 3
			❑ Record the frequency of rain, snow, and sunshine in one week and find the experimental probability of sunshine during a week, using the concept of experimental probability. DOK 3
			❑ Describe three examples of theoretical probabilities used in the media. Explain verbally or through writing why they are used and what purpose they serve. DOK 4
			❑ Support skills learned in Unit 3 by dividing into teams and playing Jeopardy to review for Unit 3 Test.
			❑ <u>Daily Homework Questions from the Textbook</u>
			❑ <u>Resource Masters Skills Practice Worksheets</u>
			❑ <u>Resource Masters Standardized Test Practice</u>
			❑ <u>Mid-Chapter Quizzes Including Key Term Vocabulary with Multiple Choice Applications</u>
			❑ <u>End of Chapter Tests Including Key Term Vocabulary, Multiple Choice Applications, and Open Response Questions with Rubric</u>