BLOOMFIELD PUBLIC SCHOOLS Bloomfield, New Jersey 07003

Curriculum Guide

ALGEBRA 1 ELECTIVE Grade: 8

Prepared by: Marc Kessler

Salvatore Goncalves, Superintendent of Schools Jaynellen Behre-Jenkins Assistant Superintendent of Curriculum and Instruction Roger Marchegiano, Supervisor of Mathematics

Board Approved: August 26, 2014

Introduction:

Algebra is the study of patterns and functions. In Algebra 1, students focus on understanding the big ideas of equivalence and linearity; learn to use a variety of representations, including modeling with variables; begin to build connections between geometric objects and algebraic expressions; and use what they have learned previously about geometry, measurement, data analysis, probability, and discrete mathematics as applications of algebra.

Students studying Algebra 1 should use appropriate tools (e.g. algebra tiles to explore operations with polynomials, including factoring) and technology, such as regular opportunities to use graphing calculators and spreadsheets. Technological tools assist in illustrating the connections between algebra and other areas of mathematics, and demonstrate the power of algebra.

The New Jersey Common Core Curriculum Standards specify the mathematics that all students should study in order to be college and career ready. Additional mathematics that students should learn in order to take advanced courses such as calculus, advanced statistics, or discrete mathematics is indicated by a (+) symbol in this guide. By successfully completing 8th Grade CMP 3, and this elective course, students will have successfully completed all of the common core standards for Algebra 1, and will be prepared for upper level mathematics courses at the high school level.

This document is a tool that will provide an overview as to what to teach, when to teach it, and how to assess student progress. As well, with considerations made for altered pacing, modifications, and accommodations; this document is to be utilized for all students enrolled in this course, regardless of ability level, native language, or classification. It is meant to be a dynamic tool that we, as educators, will revise and modify as it is used during the course of the school year.

Mapping/Sequence: The Curriculum is written following the parameters of *Understanding by Design*. The document is written as a series of units containing established transfer goals, enduring understandings, essential questions, and the necessary skills and knowledge a student must attain in a school year. Each unit also stipulates both required and suggested activities and assessments. Teachers are expected to design lessons that will meet the requirements within the curriculum; however, there is flexibility allowed in how they choose to meet these demands.

Big Ideas:

Core content for Algebra 1 includes a number of discrete skills and concepts, each related to broader mathematical principles. In teaching and learning Algebra 1, it is important for teachers and students to comprehend the following big ideas and to connect the individual skills and concepts of Algebra 1 to these broad principles.

• PATTERNS AND FUNCTIONS

Algebra provides language through which we describe and communicate mathematical patterns that arise in both mathematical and non-mathematical situations, and in particular, when one quantity is a function of a second quantity or where the quantities change in predictable ways. Ways of representing patterns and functions include tables, graphs, symbolic and verbal expressions, sequences, and formulas.

• EQUIVALENCE:

There are many different – but equivalent – forms of number, expression, function, or equation, and these forms differ in their efficacy and efficiency in interpreting or solving a problem, depending on the context. Algebra extends the properties of numbers to rules involving symbols; when applied properly, these rules allow us to transform an expression, function, or equation into an equivalent form and substitute equivalent forms for each other. Solving problems algebraically typically involves transforming one equation to another equivalent equation until the solution becomes clear.

REPRESENTATION & MODELING WITH VARIABLES

Quantities can be represented by variables, whether the quantities are unknown (as in 5x + 3 = 13), changing over time (as in $h = -16t^2$), parameters (the m and b in y = mx + b), or probabilities (where p^2 represents the probability that an event with probability p occurs twice). Relationships between quantities can be represented in compact form using expressions, equations, and inequalities. Representing quantities by variables gives us the power to recognize and describe patterns, make generalizations, prove or explain conclusions, and solve problems by converting verbal conditions and constraints into equations that can be solved. Representing quantities with variables also enables us to model situations in all areas of human endeavor and to represent them abstractly.

• LINEARITY

In many situations, the relationship between two quantities is linear so the graphical representation of the relationship is a geometric line. Linear functions can be used to show a relationship between two variables that has a constant rate of change and to represent the relationship between two quantities which vary proportionally. Linear functions can also be used to model, describe, analyze, and compare sets of data. While linearity might be considered to be a subset of the bigger idea of patterns and function, it is listed here separately as it is so prominent in Algebra 1 content.

CONNECTIONS BETWEEN ALGEBRA AND GEOMETRY

Geometric objects can be represented algebraically (for example, lines can be described using coordinates), and algebraic expressions can be interpreted geometrically (for example, systems of equations and inequalities can be solved graphically.

• CONNECTIONS BETWEEN ALGEBRA AND SYSTEMATIC COUNTING, PROBABILITY, AND STATISTICS Algebra provides a language and techniques for analyzing situations that involve chance and uncertainty, including the systematic listing and counting of all possible outcomes (as well as informal explorations of Pascal's Triangle), the determination of their probabilities, the calculation of probabilities of various events (e.g. that throwing two dice will yield a total of 7), predictions based on experimental probabilities, and correlations between two variables.

Overarching Understandings:

- Using variables in place of numbers in equations (or inequalities) allows the statement of relationships among numbers that are unknown or unspecified.
- Properties of numbers and equality can be used to transform an equation (or inequality) into equivalent, simpler equations in order to find solutions.
- Two quantities are proportional if they have the same ratio in each instance where they are measured together.
- A function is a relationship between variables in which each value of the input variable is associated with a unique value of the output variable.
- Some important families of functions are developed through transformations of the simplest form of the function.
- Many real-world mathematical problems can be represented algebraically. These representations can lead to algebraic solutions.
- A function that models a real-world situation can be used to make estimates or predictions about future occurrences.

Suggested Activities Legend: PPSW – Practice Problem Solving Workbook OTRC – On Line Teacher Resource Center AIORO - All In One Resources Online

Title of Unit	Foundation for Algebra	Grade Level	8
	Mathematics	Time Frame	
Developed By	M Kessler		
		te (Stage 1)	
	Desileu Resul	is (stage I)	
	Establishe	ed Goals	
Established Goals (G): Common Core State Standards/Technology Standards Algebra: A-SSE-1.a: Interpret parts of an expression such as terms, factors and coefficients. N-RN-3: Explain why the sum or product of two rational numbers is rational; that the sum of a rational number and an irrational number is irrational, and that the product of a nonzero rational number and an irrational number is irrational.			
	Primary Interdiscipl	inary Conne	ctions
 8.1.12.A.3: Participate in online courses, learning communities, social networks, or virtual worlds and recognize them as resources for lifelong learning. 8.1.12.F.2: Analyze the capabilities and limitations of current and emerging technology resources and assess their potential to address educational, career, personal, and social needs. 9.1.12.A.1: Apply critical thinking and problem-solving strategies during structured learning experiences. 9.1.12.A.2: Participate in online strategy and planning sessions for course-based, school-based, or outside projects. 9.1.12.B.1: Present resources and data in a format that effectively communicates the meaning of the data and its implications for solving problems, using multiple perspectives. 9.1.12.C.4: Demonstrate leadership and collaborative skills when participating in online learning communities and structured learning experiences. 9.1.12.C.5: Assume a leadership position by guiding the thinking of peers in a direction that leads to successful completion of a challenging task or project. 9.1.12.F.2: Demonstrate a positive work ethic in various settings, including the classroom and during structured learning experiences. 			
21 st Century Interdisciplinary Themes: XGlobal Awareness XFinancial, economic, business, and entrepreneurial literacy Civic Literacy Health Literacy			
Transfer			
Students will be able to independently use their learning to T1. Communicate about ideas in Algebra in a standard and understandable manner T2. Relate the topics learned in Algebra to things that they do in their everyday lives T3. Analyze real life situations in a mathematical way T4. Become proficient in daily skills involving mathematics			

Meaning		
Understandings	Essential Questions	
Students will understand that	Students will keep considering	
 U1. Algebra uses symbols to represent quantities that are unknown or that vary. U2. Mathematical phrases and real-world relationships can be represented using symbols and operations. U3. Equations are used to represent the relationship between two quantities that have the same value. U4. Sometimes, the value of one quantity can be found if the value of another is known. The relationship between the quantities can be represented in different ways, including tables, equations, and graphs. U5. When simplifying an expression operations must be performed in the correct order. U6. Mathematics involves the use of different types of numbers which can be represented in a hierarchical model U7. Mathematical properties can be used to transform mathematical relationships. 	 Q1. How can you represent quantities, patterns, and relationships? Q2. How are properties related to algebra? Q3. How do you identify the correct mathematical relationship from the context of a real life situation? Q4. What are advantages and disadvantages of different mathematical relationships? Q5. What are different ways you can verify the correctness of your mathematical transformations? 	
Acquis	sition	
Knowledge	Skills	
Students will know	Students will be able	
 K1. Variables and expressions K2. Order of operations and evaluating expressions K3. Real numbers and the number line K4. Properties of real numbers K5. Adding and subtracting real numbers K6. Multiplying and dividing real numbers K7. The distributive property K8. An introductions to equations K9. Patterns, equations, and graphs 	 S1. To write algebraic expressions S2. To simplify expressions involving exponents S3. To use the order of operations to evaluate expressions S4. To classify, graph, and compare real numbers S5. To find and estimate square roots S6. To identify and use properties of real numbers S7. To find sums and differences of real numbers S8. To find products and quotients of real numbers S9. To use the distributed property to simplify expressions S10. To solve equations using tables and mental math S11. To use tables, equations, and graphs to describe relationships 	

Evidence (Stage 2)		
<u>Checks for Alignment</u>	Evaluation Criteria Performance is judged in terms of	Assessment Evidence
T1-T4 U1-U7 Q1-Q5	BLOOMS TAXONOMY RUBRIC	Transfer Task(s) Formative Book problems, Worksheets, Cooperative Activities, Problem Solving Activities, Do-Now, Closure Activities. Summative
		Used at the end of identified topics to assess learning Quizzes, Tests, Projects, Presentations
K1-K9 S1-S11	BLOOMS TAXONOMY RUBRIC	Other Evidence Formative Essays Journals Rubrics Reports Other Assessments
		Summative Pre-assessments Journal entries Informal observations Other

Algebra 1 Grade 8

Curriculum Guide

Learning Plan (Stage 3)				
Checks for alignmen and best practice	Checks for alignmentSummary of Key Learning Events and Instructionand best practiceThe teaching and learning needed to achieve the unit goals.			
	Required Activities	Required Resources		
	Student groups will be formed to examine the Challenge problems in the text.	Text: Algebra 1 Pearson		
	Suggested Activities	Suggested Resources		
	Think about a plan 1-1 PPSW Game 1-1: "Matching Expressions" OTRC	Text: Algebra 1: Pearson		
	Think about a plan 1-2 PPSW Puzzle 1-2: "Calc-words" OTRC	Text: Algebra 1: Pearson		
	Think about a plan 1-7 PPSW Game 1-7: "Algebra Baseball" OTRC	Text: Algebra 1: Pearson		
	Think about a plan 1-8 PPSW Puzzle 1-8: "Algebra Connections" OTRC Concept Byte 1-8: "Using Tables to Solve Equations" (p59)	Text: Algebra 1: Pearson		
	Think about a plan 1-9 PPSW Activity 1-9: "Sequencing Patterns" OTRC	Text: Algebra 1: Pearson		

Strategies for Differentiation		
Students Below Target	Students Meeting or Exceeding Target	
Paired/Group Activity	Role Play	
Guided Practice	SQ3R	
Learning Buddies	Cooperative Learning	
Varied Rubrics	Choice Boards/Menus	
QAR	Independent Study	
Cooperative Learning	Interest Based Mini Lessons	
Small Group Instruction	Skill-Based Mini Lessons	
Visual Cues Found On Worksheets	Tiered Products Activities	
Chunking And Grouping Material	Projects	
Advance Notice of Assignments	Enrichments worksheets	
Review With Study Skills And Strategies Training	Virtual Classroom	
Test Modifications/Time Extensions	Use Compacting strategy to account for prior student mastery of objectives	
Pretest Students to Assess Key Pre-skills and Background Knowledge	Pretest Students to Assess Key Pre-skills and Background Knowledge	
Provide grouping by difficulty level	Provide grouping by difficulty level	
Provide different demonstrations or models		
Offer choice of response, verbal using numerical representations		
Use story mapping for understanding of word problems		
Use computer software to review and reinforce skills taught		
Assign homework targeted to student need at key points		
Use multiple modes of teacher presentation		
Use think-pair-share groups		
Use of manipulatives		
Provision of calculator		
Use flash-cards, number line, graph paper		
Use games to provide reinforcement of math skills		
User interest centers		
Provide use of choice boards, which contain a variety of skill activities		
Use ongoing assessment of readiness and interests		
Tier graphic organizers		

Title of Unit	Solving Equations	Grade Level	8
Curriculum Area	Mathematics	Time Frame	
Developed By	M. Kessler		
	Desired Resul	ts (Stage 1)	
	Establishe	ed Goals	
Established Goals (G): Common Core State Standards/Technology Standards Algebra: A-REI-3: Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters. A-CED-2: Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales. N-Q-1: Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.			
	Primary Interdiscipl	inary Conne	ctions
 8.1.12.A.3: Participate in online courses, learning communities, social networks, or virtual worlds and recognize them as resources for lifelong learning. 8.1.12.F.2: Analyze the capabilities and limitations of current and emerging technology resources and assess their potential to address educational, career, personal, and social needs. 9.1.12.A.1: Apply critical thinking and problem-solving strategies during structured learning experiences. 9.1.12.A.2: Participate in online strategy and planning sessions for course-based, school-based, or outside projects. 9.1.12.B.1: Present resources and data in a format that effectively communicates the meaning of the data and its implications for solving problems, using multiple perspectives. 9.1.12.C.4: Demonstrate leadership and collaborative skills when participating in online learning communities and structured learning experiences. 9.1.12.C.5: Assume a leadership position by guiding the thinking of peers in a direction that leads to successful completion of a challenging task or project. 9.1.12.F.2: Demonstrate a positive work ethic in various settings, including the classroom and during structured learning experiences. 			

21st Century Interdisciplinary Themes:

___X__ Global Awareness _____ Civic Literacy ____X___ Financial, economic, business, and entrepreneurial literacy ______ Health Literacy

Transfer

Students will be able to independently use their learning to...

- T1. Communicate about ideas in Algebra in a standard and understandable manner T2. Relate the topics learned in Algebra to things that they do in their everyday lives
- T3. Analyze real life situations in a mathematical way
- T4. Become proficient in daily skills involving mathematics

Meaning		
Understandings	Essential Questions	
Students will understand that	Students will keep considering	
U1. Equations can describe, explain, and predict various aspects of the real world.	Q1. What kinds of relationships can proportions represent? Q 2. Can equations that appear to be different be equivalent? Q3. How can you solve equations?	
Acquisition		
Knowledge Students will know	Skills Students will be able	
K1. Solving one-step equations K2. Solving two-step equation K3. Solving multi-step equations K4. Solving equations with variables on both sides K5. Literal equations and formulas	 S1. To solve one-step equations in one variable S2. To solve two-step equations in one variable S3. To solve multi-step equations in one variable S4. To solve equations with variables on both sides S5. To identify equations that are identities or have no solution S6. To rewrite and use literal equations and formulas 	

Evidence (Stage 2)		
Checks for Alignment	Evaluation Criteria Performance is judged in terms of	Assessment Evidence
T1-T4 U1 Q1-Q3	BLOOMS TAXONOMY RUBRIC	Transfer Task(s) Formative Book problems, Worksheets, Cooperative Activities, Problem Solving Activities, Do-Now, Closure Activities. Summative
		Used at the end of identified topics to assess learning Quizzes, Tests, Projects, Presentations
K1-K5 S1-S6	BLOOMS TAXONOMY RUBRIC	Other Evidence Formative Essays Journals Rubrics Reports Other Assessments
		Summative Pre-assessments Journal entries Informal observations Other

Algebra 1 Grade 8

Curriculum Guide

Learning Plan (Stage 3)			
Checks for alignmen and best practice	hent Summary of Key Learning Events and Instruction The teaching and learning needed to achieve the unit goals.		
	Required Activities	Required Resources	
	Student groups will be formed to examine the Challenge problems in the text.	Text: Algebra 1 Pearson	
	Suggested Activities	Suggested Resources	
	Think about a plan 2-1 PPSW Game 2-1: "Algebra 1-Step" OTRC	Text: Algebra 1: Pearson	
	Think about a plan 2-2 PPSW Enrichment 2-2: "Solving two-step Equations" AIORO	Text: Algebra 1: Pearson	
	Think about a plan 2-3 PPSW Concept Byte 2-3: "Modeling Equations With Variables on Both Sides" (Pg. 101)	Text: Algebra 1: Pearson	
	Think about a plan 2-4 PPSW Puzzle 2-4: "Breaking the Code" OTRC	Text: Algebra 1: Pearson	
	Think about a plan 2-5 PPSW Concept Byte 2-5: "Finding Perimeter, Area, and Volume" (Pg. 115)	Text: Algebra 1: Pearson	
	Think about a plan 2-10 PPSW Puzzle 2-10: "Mental-Math Rounds" OTRC	Text: Algebra 1: Pearson	

Strategies for Differentiation		
Students Below Target	Students Meeting or Exceeding Target	
Paired/Group Activity	Role Play	
Guided Practice	SQ3R	
Learning Buddies	Cooperative Learning	
Varied Rubrics	Choice Boards/Menus	
Provide use of choice boards, which contain a variety of skill activities	Independent Study	
Cooperative Learning	Interest Based Mini Lessons	
Small Group Instruction	Skill-Based Mini Lessons	
Visual Cues Found On Worksheets	Tiered Products Activities	
Tier graphic organizers	Projects	
Advance Notice of Assignments	Enrichments worksheets	
Review With Study Skills And Strategies Training	Virtual Classroom	
Test Modifications/Time Extensions	Use Compacting strategy to account for prior student mastery of objectives	
Pretest Students to Assess Key Pre-skills and Background Knowledge	Pretest Students to Assess Key Pre-skills and Background Knowledge	
Provide grouping by difficulty level	Provide grouping by difficulty level	
Provide different demonstrations or models		
Offer choice of response, verbal using numerical representations		
Use story mapping for understanding of word problems		
Use computer software to review and reinforce skills taught		
Assign homework targeted to student need at key points		
Use multiple modes of teacher presentation		
Use think-pair-share groups		
Manipulatives		
Use flash-cards, number line, graph paper		

Title of Unit	Solving Inequalities	Grade Level	8
Curriculum Area	Mathematics	Time Frame	
Developed By	M. Kessler		

Desired Results (Stage 1)

Established Goals

Established Goals (G): Common Core State Standards/Technology Standards

Algebra: A-REI-3: Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.

Primary Interdisciplinary Connections

8.1.12.A.3: Participate in online courses, learning communities, social networks, or virtual worlds and recognize them as resources for lifelong learning. **8.1.12.F.2:** Analyze the capabilities and limitations of current and emerging technology resources and assess their potential to address educational, career, personal, and social needs.

9.1.12.A.1: Apply critical thinking and problem-solving strategies during structured learning experiences.

9.1.12.A.2: Participate in online strategy and planning sessions for course-based, school-based, or outside projects.

9.1.12.B.1: Present resources and data in a format that effectively communicates the meaning of the data and its implications for solving problems, using multiple perspectives.

9.1.12.C.4: Demonstrate leadership and collaborative skills when participating in online learning communities and structured learning experiences.

9.1.12.C.5: Assume a leadership position by guiding the thinking of peers in a direction that leads to successful completion of a challenging task or project. **9.1.12.F.2:** Demonstrate a positive work ethic in various settings, including the classroom and during structured learning experiences.

21st Century Interdisciplinary Themes:

___X__ Global Awareness _____ Civic Literacy __X__ Financial, economic, business, and entrepreneurial literacy _____ Health Literacy

Transfer

Students will be able to independently use their learning to...

- T1. Communicate about ideas in Algebra in a standard and understandable manner T2. Relate the topics learned in Algebra to things that they do in their everyday lives
- T3. Analyze real life situations in a mathematical way
- T4. Become proficient in daily skills involving mathematics

Meaning		
Understandings	Essential Questions	
Students will understand that	Students will keep considering	
U1. An inequality is a mathematical sentence that uses an inequality symbol to compare the values of two expressions. Inequalities can be represented with symbols. Their solutions can be represented on a number line.U2. Properties of inequality can be used to solve inequalities (including multistep and compound inequalities).U3. An equivalent pair of linear equations or inequalities can be used to solve absolute value equations and inequalities.	Q1. How do you represent relationships between quantities that are not equal?Q2. Can inequalities that appear to be different be equivalent?Q3. How can you solve inequalities?Q4. What are real life applications of inequalities?	
Acquisition		
Knowledge Students will know	Skills Students will be able	
 K1. Inequalities and their graphs K2. Solving inequalities using addition or subtraction K3. Solving inequalities using multiplication or division K4. Solving multi-step inequalities K5. Working with sets K6. Compound inequalities K7. Absolute value equations and inequalities K8. Union and intersections of sets 	 S1. To write, graph, and identify solutions of inequalities S2. To use addition or subtraction to solve inequalities S3. To use multiplication or division to solve inequalities S4. To solve multi-step inequalities S5. To write sets and identify subsets S6. To find the complement of a set S7. To solve and graph inequalities containing the word <i>and</i> S8. To solve equations and inequalities involving absolute value S10. To find the union and intersections of sets 	

Evidence (Stage 2)		
Checks for Alignment	Evaluation Criteria Performance is judged in terms of	Assessment Evidence
T1-T4 U1-U3 Q1-Q4	BLOOMS TAXONOMY RUBRIC	Transfer Task(s) Formative Book problems, Worksheets, Cooperative Activities, Problem Solving Activities, Do-Now, Closure Activities. Summative Used at the end of identified topics to assess learning
K1-K8 S1-S10	BLOOMS TAXONOMY RUBRIC	Osed at the end of identified topics to assess learning Quizzes, Tests, Projects, Presentations Other Evidence Formative Essays Journals Rubrics Reports Other Assessments Summative Pre-assessments Journal entries
		Other

Algebra 1 Grade 8

Curriculum Guide

Learning Plan (Stage 3)		
Checks for alignme	nt Summary of Key Learn	ing Events and Instruction
	Required Activities	Required Resources
	Student groups will be formed to examine the Challenge problems in the text.	Text: Algebra 1 Pearson
	Suggested Activities	Suggested Resources
	Think about a plan 3-1 PPSW Game 3-1: "Tic-Stack-Toe" OTRC	Text: Algebra 1: Pearson
	Think about a plan 3-2 PPSW Activity 3-2: "Which Number Am I?" OTRC	Text: Algebra 1: Pearson
	Think about a plan 3-3 PPSW Concept Byte 3-3: "More Algebraic Properties" (Pg. 184)	Text: Algebra 1: Pearson
	Think about a plan 3-4 PPSW Concept Byte 3-4: "Modeling Multi-step Inequalities" (p185)	Text: Algebra 1: Pearson
	Think about a plan 3-6 PPSW Activity 3-6: "Having a Ball" OTRC	Text: Algebra 1: Pearson
	Think about a plan 3-7 PPSW Puzzle 3-7: "Inequalities With a Twist" OTRC	Text: Algebra 1: Pearson

Strategies for Differentiation		
Students Below Target	Students Meeting or Exceeding Target	
Paired/Group Activity	Role Play	
Guided Practice	SQ3R	
Learning Buddies	Cooperative Learning	
Varied Rubrics	Choice Boards/Menus	
Provide use of choice boards, which contain a variety of skill activities	Independent Study	
Cooperative Learning	Interest Based Mini Lessons	
Small Group Instruction	Skill-Based Mini Lessons	
Visual Cues Found On Worksheets	Tiered Products Activities	
Tier graphic organizers	Projects	
Advance Notice of Assignments	Enrichments worksheets	
Review With Study Skills And Strategies Training	Virtual Classroom	
Test Modifications/Time Extensions	Use Compacting strategy to account for prior student mastery of objectives	
Pretest Students to Assess Key Pre-skills and Background Knowledge	Pretest Students to Assess Key Pre-skills and Background Knowledge	
Provide grouping by difficulty level	Provide grouping by difficulty level	
Provide different demonstrations or models		
Offer choice of response, verbal using numerical representations		
Use story mapping for understanding of word problems		
Use computer software to review and reinforce skills taught		
Assign homework targeted to student need at key points		
Use multiple modes of teacher presentation		
Use think-pair-share groups		
Manipulatives		
Use flash-cards, number line, graph paper		

Title of Unit	Introduction to Functions	Grade Level	8
Curriculum Area	Mathematics	Time Frame	
Developed By	M. Kessler		
Desired Results (Stage 1)			
Established Goals			

Established Goals (G): Common Core State Standards/Technology Standards

Functions: F-IF-1. Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If *f* is a function and *x* is an element of its domain, then f(x) denotes the output of *f* corresponding to the input *x*. The graph of *f* is the graph of the equation y = f(x).

F-IF-2. Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context. F-IF-3. Recognize that sequences are functions, sometimes defined recursively, whose domain is a subset of the integers. For example, the Fibonacci sequence is defined recursively by f(0) = f(1) = 1, f(n+1) = f(n) + f(n-1) for $n \in 1$.

F-IF-4. For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. *Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.*

F-IF-5. Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. For example, if the function h(n) gives the number of person-hours it takes to assemble n engines in a factory, then the positive integers would be an appropriate domain for the function. F-IF-6. Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.

Primary Interdisciplinary Connections

8.1.12.A.3: Participate in online courses, learning communities, social networks, or virtual worlds and recognize them as resources for lifelong learning. **8.1.12.F.2:** Analyze the capabilities and limitations of current and emerging technology resources and assess their potential to address educational, career, personal, and social needs.

9.1.12.A.1: Apply critical thinking and problem-solving strategies during structured learning experiences.

9.1.12.A.2: Participate in online strategy and planning sessions for course-based, school-based, or outside projects.

9.1.12.B.1: Present resources and data in a format that effectively communicates the meaning of the data and its implications for solving problems, using multiple perspectives.

9.1.12.C.4: Demonstrate leadership and collaborative skills when participating in online learning communities and structured learning experiences.

9.1.12.C.5: Assume a leadership position by guiding the thinking of peers in a direction that leads to successful completion of a challenging task or project. **9.1.12.F.2:** Demonstrate a positive work ethic in various settings, including the classroom and during structured learning experiences.

21 st Century Interdisciplinary Themes:		
X Global Awareness	X_	
Civic Literacy		

X	_ Financial, economic, business, and entrepreneurial literacy	
	_ Health Literacy	

Transfer

Students will be able to independently use their learning to...

- T1. Communicate about ideas in Algebra in a standard and understandable manner T2. Relate the topics learned in Algebra to things that they do in their everyday lives
- T3. Analyze real life situations in a mathematical way
- T4. Become proficient in daily skills involving mathematics

Meaning		
Understandings	Essential Questions	
Students will understand that	Students will keep considering	
 U1. Relationships may be represented using words, tables, equations, sets of ordered pairs, and graphs U2. Functions (linear and nonlinear) are a special type of relation where each value in the domain is paired with exactly one value in the range. U3. Many real-world functional relationships can be represented by equations. U4. Equations can be used to find the solutions of given real-world problems. U5. Some sequences have function rules that can be used to find any term of the sequence. 	Q1. How can you represent and describe functions?Q2. How can functions describe real-world situations?Q3. What do different representations of functions (words, tables, equations, ordered pairs, and graphs) tell us about the relationships?	
Acquis	ition	
Knowledge	Skills	
Students will know	Students will be able	
 K1. Using graphs to relate two quantities K2. Patterns and linear functions K3. Patterns and nonlinear functions K4. Graphing a function rule K5. Writing a function rule K6. Formalizing relations and functions K7. Sequences and functions 	 S1. To represent mathematical relationships using graphs S2. To identify and represent patterns that describe linear functions S3. To identify and represent patterns that describe nonlinear functions S4. To graph equations that represent functions S5. To write questions that represent functions S6. To determine whether a relation is a function. To find domain and range and use function notation S7. To identify and extend patterns and sequences. To represent arithmetic sequences using function notation 	

Evidence (Stage 2)		
Checks for Alignment	Evaluation Criteria Performance is judged in terms of	Assessment Evidence
T1-T4 U1-U5 Q1-Q3	BLOOMS TAXONOMY RUBRIC	Transfer Task(s) Formative Book problems, Worksheets, Cooperative Activities, Problem Solving Activities, Do-Now, Closure Activities.
		Used at the end of identified topics to assess learning Quizzes, Tests, Projects, Presentations
K1-K7 S1-S7	BLOOMS TAXONOMY RUBRIC	Other Evidence Formative Essays Journals Rubrics Reports Other Assessments
		Summative Pre-assessments Journal entries Informal observations Other

Algebra 1 Grade 8

Curriculum Guide

Learning Plan (Stage 3)			
Checks for alignmen and best practice	Checks for alignment Summary of Key Learning Events and Instruction and best practice The teaching and learning needed to achieve the unit goals.		
	Required Activities	Required Resources	
	Student groups will be formed to examine the Challenge problems in the text.	Text: Algebra 1 Pearson	
	Suggested Activities	Suggested Resources	
	Enrichment 4-2 AIORO Think about a plan 4-2 PPSW Activity 4-2: "Common Themes" OTRC	Text: Algebra 1: Pearson	
	Think about a plan 4-3 PPSW Puzzle 4-3: "The Quadratic Code" OTRC	Text: Algebra 1: Pearson	
	Think about a plan 4-4 PPSW Concept byte 4-4: "Graphing Functions and Solving Equations" (Pg.260)	Text: Algebra 1: Pearson	
	Think about a plan 4-5 PPSW Puzzle 4-5: "Chasing Down the Clues" OTRC	Text: Algebra 1: Pearson	
	Think about a plan 4-6 PPSW Game 4-6: "Home on the Range" OTRC	Text: Algebra 1: Pearson	
	Think about a plan 4-7 PPSW Game 4-7: "Walking the Walk" OTRC	Text: Algebra 1: Pearson	

Strategies for Differentiation		
Students Below Target	Students Meeting or Exceeding Target	
Paired/Group Activity	Role Play	
Guided Practice	SQ3R	
Learning Buddies	Cooperative Learning	
Varied Rubrics	Choice Boards/Menus	
Provide use of choice boards, which contain a variety of skill activities	Independent Study	
Cooperative Learning	Interest Based Mini Lessons	
Small Group Instruction	Skill-Based Mini Lessons	
Visual Cues Found On Worksheets	Tiered Products Activities	
Tier graphic organizers	Projects	
Advance Notice of Assignments	Enrichments worksheets	
Review With Study Skills And Strategies Training	Virtual Classroom	
Test Modifications/Time Extensions	Use Compacting strategy to account for prior student mastery of objectives	
Pretest Students to Assess Key Pre-skills and Background Knowledge	Pretest Students to Assess Key Pre-skills and Background Knowledge	
Provide grouping by difficulty level	Provide grouping by difficulty level	
Provide different demonstrations or models		
Offer choice of response, verbal using numerical representations		
Use story mapping for understanding of word problems		
Use computer software to review and reinforce skills taught		
Assign homework targeted to student need at key points		
Use multiple modes of teacher presentation		
Use think-pair-share groups		
Manipulatives		
Use flash-cards, number line, graph paper		

Title of Unit	Linear Functions	Grade Level	8
Curriculum Area	Mathematics	Time Frame	
Developed By	M. Kessler		
	Desired Resul	ts (Stage 1)	
	Establishe	ed Goals	
Established Goals (G): Common Core State Standards/Technology Standards Functions : F-IF-6. Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph. F-IF-7a. Graph linear and quadratic functions and show intercepts, maxima, and minima. F-IF-7b. Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions. Geometry: G-GPE- 5. Prove the slope criteria for parallel and perpendicular lines and use them to solve geometric problems (e.g., find the equation of a line parallel or perpendicular to a given line that passes through a given point). Statistics: S-ID-6 c. Fit a linear function for a scatter plot that suggests a linear association. S-ID-7 Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data			
Primary Interdisciplinary Connections			
 8.1.12.A.3: Participate in online courses, learning communities, social networks, or virtual worlds and recognize them as resources for lifelong learning. 8.1.12.F.2: Analyze the capabilities and limitations of current and emerging technology resources and assess their potential to address educational, career, personal, and social needs. 9.1.12.A.1: Apply critical thinking and problem-solving strategies during structured learning experiences. 9.1.12.B.1: Present resources and data in a format that effectively communicates the meaning of the data and its implications for solving problems, using multiple perspectives. 9.1.12.C.4: Demonstrate leadership and collaborative skills when participating in online learning communities and structured learning experiences. 9.1.12.C.5: Assume a leadership position by guiding the thinking of peers in a direction that leads to successful completion of a challenging task or project. 9.1.12.F.2: Demonstrate a positive work ethic in various settings, including the classroom and during structured learning experiences. 			
21 st Century Interdisciplinary Themes:			
X Global AwarenessX Financial, economic, business, and entrepreneurial literacy			

_____ Health Literacy

____ Civic Literacy

Transfer

- Students will be able to independently use their learning to...T1. Communicate about ideas in Algebra in a standard and understandable mannerT2. Relate the topics learned in Algebra to things that they do in their everyday lives
- T3. Analyze real life situations in a mathematical wayT4. Become proficient in daily skills involving mathematics

Meaning		
Understandings	Essential Questions	
Students will understand that	Students will keep considering	
 U1. Ratios can be used to show a relationship between changing quantities, such as vertical and horizontal change. U2. Different forms of a linear equation can reveal or obscure aspects of the linear relationship. (Forms of linear equations include the Slope-Intercept, Point-Slope, and Standard). U3. Two sets of numerical data can be graphed as ordered pairs. If the two sets of data are related, a line on the graph can be used to estimate or predict values. 	Q1. What does the slope of a line indicate about the line?Q2. What information does the equation of a line give you?Q3. How can you make predictions based on a scatter plot?Q4. What are characteristics of real life situations that can be modeled using linear relationships?	
Acquis	ition	
Knowledge Students will know	Skills Students will be able	
 K1. Rate of Change and Slope K2. Direct Variation K3. Slope-Intercept Form K4. Point-Slope Form K5. Standard Form K6. Parallel and Perpendicular Lines K7. Scatter Plots and Trend Lines K8. Graphing Absolute Value Functions 	 S1. To find rates of change from tables. S2. To find slope. S3. To write and graph an equation of a direct variation. S4. To write linear equations using slope-intercept form. S5. To graph linear equations in slope-intercept form. S6. To write and graph linear equations using point-slope form. S7. To graph linear equations in standard form. S9. To determine whether lines are parallel, perpendicular, or neither. S10. To write an equation of a trend line and of a line of best fit. S12. To use a trend line and a line of best fit to make predictions. S13. To graph an absolute value function. 	

Evidence (Stage 2)		
Checks for Alignment	Evaluation Criteria Performance is judged in terms of	Assessment Evidence
T1-T4 U1-U3 Q1-Q4	BLOOMS TAXONOMY RUBRIC	Transfer Task(s) Formative Book problems, Worksheets, Cooperative Activities, Problem Solving Activities, Do-Now, Closure Activities.
		Used at the end of identified topics to assess learning Quizzes, Tests, Projects, Presentations
K1-K8 S1-S14	BLOOMS TAXONOMY RUBRIC	Other Evidence Formative Essays Journals Rubrics Reports Other Assessments
		Summative Pre-assessments Journal entries Informal observations Other

Algebra 1 Grade 8

Curriculum Guide

Learning Plan (Stage 3)			
Checks for alignment Summary of Key Learning Events and Instruction and best practice The teaching and learning needed to achieve the unit goals.			
•	Required Activities	Required Resources	
	Student groups will be formed to examine the Challenge problems in the text.	Text: Algebra 1 Pearson	
	Suggested Activities	Suggested Resources	
	Think About a Plan 5-2 PPSW Enrichment 5-2 AIORO	Text: Algebra 1: Pearson	
	Concept Byte: "Investigating y = mx + b" (Pg. 305) Game 5-3: "It's Your Turn"	Text: Algebra 1: Pearson	
	Puzzle 5-4: "Slippery Slope" OTRC	Text: Algebra 1: Pearson	
	Enrichment 5-5 AIORO Game 5-5: "It's Downhill from Here" OTRC	Text: Algebra 1: Pearson	
	Think About a Plan (5-6) PPSW Game 5-6: "Dot Plot" OTRC	Text: Algebra 1: Pearson	
	Think About a Plan 5-7 PPSW Enrichment 5-7 AlORO	Text: Algebra 1: Pearson	
	Concept Byte: "Characteristics of Absolute Value Graphs" (p347) Think About a Plan 5-8 Puzzle 5-8: "Rowing Exercise" OTRC	Text: Algebra 1: Pearson	

Strategies for Differentiation		
Students Below Target	Students Meeting or Exceeding Target	
Paired/Group Activity	Role Play	
Guided Practice	SQ3R	
Learning Buddies	Cooperative Learning	
Varied Rubrics	Choice Boards/Menus	
Provide use of choice boards, which contain a variety of skill activities	Independent Study	
Cooperative Learning	Interest Based Mini Lessons	
Small Group Instruction	Skill-Based Mini Lessons	
Visual Cues Found On Worksheets	Tiered Products Activities	
Tier graphic organizers	Projects	
Advance Notice of Assignments	Enrichments worksheets	
Review With Study Skills And Strategies Training	Virtual Classroom	
Test Modifications/Time Extensions	Use Compacting strategy to account for prior student mastery of objectives	
Pretest Students to Assess Key Pre-skills and Background Knowledge	Pretest Students to Assess Key Pre-skills and Background Knowledge	
Provide grouping by difficulty level	Provide grouping by difficulty level	
Provide different demonstrations or models		
Offer choice of response, verbal using numerical representations		
Use story mapping for understanding of word problems		
Use computer software to review and reinforce skills taught		
Assign homework targeted to student need at key points		
Use multiple modes of teacher presentation		
Use think-pair-share groups		
Manipulatives		
Use flash-cards, number line, graph paper		

Title of Unit	Systems of Equations and Inequalities	Grade Level	8
Curriculum Area	Mathematics	Time Frame	
Developed By	M. Kessler		
	Desired Res	sults (Stage 1)	
	Establis	hed Goals	
Established Goals (G): Common Core State Standards/Technology Standards Algebra: A-REI- 5. Prove that, given a system of two equations in two variables, replacing one equation by the sum of that equation and a multiple of the other produces a system with the same solutions. A-REI- 6. Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables. A-REI- 12. Graph the solutions to a linear inequality in two variables as a half-plane (excluding the boundary in the case of a strict inequality), and graph			
	Primary Interdisc	iplinary Conne	ections
 8.1.12.A.3: Participate in online courses, learning communities, social networks, or virtual worlds and recognize them as resources for lifelong learning. 8.1.12.F.2: Analyze the capabilities and limitations of current and emerging technology resources and assess their potential to address educational, career, personal, and social needs. 9.1.12.A.1: Apply critical thinking and problem-solving strategies during structured learning experiences. 9.1.12.A.2: Participate in online strategy and planning sessions for course-based, school-based, or outside projects. 9.1.12.B.1: Present resources and data in a format that effectively communicates the meaning of the data and its implications for solving problems, using multiple perspectives. 9.1.12.C.4: Demonstrate leadership and collaborative skills when participating in online learning communities and structured learning experiences. 9.1.12.C.5: Assume a leadership position by guiding the thinking of peers in a direction that leads to successful completion of a challenging task or project. 9.1.12.F.2: Demonstrate a positive work ethic in various settings, including the classroom and during structured learning experiences. 			
21 st Century Interdisciplinary Themes: XGlobal Awareness XFinancial, economic, business, and entrepreneurial literacy Civic Literacy Health Literacy			

Transfer

Students will be able to independently use their learning to...

- T1. Communicate about ideas in Algebra in a standard and understandable manner T2. Relate the topics learned in Algebra to things that they do in their everyday lives
- T3. Analyze real life situations in a mathematical way
- T4. Become proficient in daily skills involving mathematics

Meaning		
Understandings	Essential Questions	
Students will understand that	Students will keep considering	
U1. Systems of linear equations can be used to model problems.U2. Systems of equations can be solved using a variety of different techniques.U3. The solutions of a system of linear inequalities can be represented by the region where the graphs of the individual inequalities overlap.	 Q1. How can you solve a system of equations or inequalities? Q2. How do systems of equations model real-world situations? Q3. What are different methods of solving systems of equations and what are the advantages and disadvantages of each? Q4. How might you determine which technique for solving a system of equations is appropriate? 	
Acquisition		
Knowledge Students will know	Skills Students will be able	
 K1. Solving Systems by Graphing K2. Solving Systems using Substitution K3. Solving Systems using Elimination K4. Applications of Linear Systems K5. Linear Inequalities K6. Systems of Linear Inequalities 	 S1. To solve systems of equations by graphing. S2. To analyze special systems. S3. To solve systems of equations using substitution. S4. To solve systems by adding or subtracting to eliminate a variable. S5. To choose the best method for solving a system of linear equations. S6. To graph linear inequalities in two variables. S7. To use linear inequalities when modeling real-world situations. S8. To model real-world situations using systems of linear inequalities. 	

Evidence (Stage 2)		
Checks for Alignment	Evaluation Criteria Performance is judged in terms of	Assessment Evidence
T1-T4 U1-U3 Q1-Q4	BLOOMS TAXONOMY RUBRIC	Transfer Task(s) Formative Book problems, Worksheets, Cooperative Activities, Problem Solving Activities, Do-Now, Closure Activities. Summative Used at the end of identified topics to assess learning Quizzes, Tests, Projects, Presentations
K1-K6 S1-S8	BLOOMS TAXONOMY RUBRIC	Other Evidence Formative Essays Journals Rubrics Reports Other Assessments Summative Pre-assessments Journal entries Informal observations Other

Algebra 1 Grade 8

Curriculum Guide

Learning Plan (Stage 3)				
Checks for alignmen and best practice	Checks for alignment Summary of Key Learning Events and Instruction and best practice The teaching and learning needed to achieve the unit goals.			
	Required Activities	Required Resources		
	Student groups will be formed to examine the Challenge problems in the text.	Text: Algebra 1 Pearson		
	Suggested Activities	Suggested Resources		
	Concept Byte: "Solving Systems Using Tables and Graphs" (Pg. 366) Think about a Plan 6-1 PPSW	Text: Algebra 1: Pearson		
	Think About a Plan 6-2 PPSW Puzzle 6-2: "The Shortest Path" OTRC	Text: Algebra 1: Pearson		
	Think About a Plan 6-3 PPSW	Text: Algebra 1: Pearson		
	Think About a Plan 6-4 PPSW Activity 6-4: "A Real World Application" OTRC	Text: Algebra 1: Pearson		
	Think About a Plan 6-5 PPSW Enrichment 6-5 AlORO	Text: Algebra 1: Pearson		
	Concept Byte: "Graphing Linear Inequalities" (Pg. 402) Think About a Plan 6-6 Puzzle: 6-6: "Figure Me Out" OTRC	Text: Algebra 1: Pearson		

Strategies for Differentiation		
Students Below Target	Students Meeting or Exceeding Target	
Paired/Group Activity	Role Play	
Guided Practice	SQ3R	
Learning Buddies	Cooperative Learning	
Varied Rubrics	Choice Boards/Menus	
Provide use of choice boards, which contain a variety of skill activities	Independent Study	
Cooperative Learning	Interest Based Mini Lessons	
Small Group Instruction	Skill-Based Mini Lessons	
Visual Cues Found On Worksheets	Tiered Products Activities	
Tier graphic organizers	Projects	
Advance Notice of Assignments	Enrichments worksheets	
Review With Study Skills And Strategies Training	Virtual Classroom	
Test Modifications/Time Extensions	Use Compacting strategy to account for prior student mastery of objectives	
Pretest Students to Assess Key Pre-skills and Background Knowledge	Pretest Students to Assess Key Pre-skills and Background Knowledge	
Provide grouping by difficulty level	Provide grouping by difficulty level	
Provide different demonstrations or models		
Offer choice of response, verbal using numerical representations		
Use story mapping for understanding of word problems		
Use computer software to review and reinforce skills taught		
Assign homework targeted to student need at key points		
Use multiple modes of teacher presentation		
Use think-pair-share groups		
Manipulatives		
Use flash-cards, number line, graph paper		

Title of Unit	Exponents and Exponential Eurotions	Grade Level	8
	Mathematics	Time Frame	
Developed By	M. Kessler		
	Desired	Results (Stane 1)	
	Desiled	Results (Stage 1)	
	Esta	ablished Goals	
Established Coals (C): C	ommon Coro Stato Standards/Tochnology	Standards	
Number and Quantity:	Shimon core State Standards/ rechnology	Standards	
N-RN- 2. Rewrite express	ions involving radicals and rational expone	ents using the properties of expon	ents.
N-Q-1. Use units as a wa	ay to understand problems and to guide the	e solution of multi-step problems;	choose and interpret units consistently in formulas;
choose and interpret the	scale and the origin in graphs and		
data displays.			
Functions: F-IF-/ e. Gra	on exponential and logarithmic functions, s	howing intercepts and end behav	ior, and trigonometric functions, showing period,
F-IF-8 b Lise the properti	as of avalants to interpret avarassions fo	r exponential functions For even	note identify percent rate of change in functions such
$a_{\rm S} v = (1.02)t v = (0.97)t$	$v = (1 \ 01)12t$ $v = (1 \ 2)t/10$ and classify the	em as representing exponential of	prowth or decay
	Primary Inter	disciplinary Coppo	ctions
	Filliary filler	disciplinal y conne	
 8.1.12.A.3: Participate in online courses, learning communities, social networks, or virtual worlds and recognize them as resources for lifelong learning. 8.1.12.F.2: Analyze the capabilities and limitations of current and emerging technology resources and assess their potential to address educational, 			
9112 A 1. Apply critical	thinking and problem-solving strategies du	ring structured learning experience	2es
9.1.12.A.2: Participate in	online strategy and planning sessions for	course-based, school-based, or o	utside projects.
9.1.12.B.1: Present resources and data in a format that effectively communicates the meaning of the data and its implications for solving problems, using multiple perspectives			
9.1.12.C.4: Demonstrate leadership and collaborative skills when participating in online learning communities and structured learning experiences.			
9.1.12.C.5: Assume a leadership position by guiding the thinking of peers in a direction that leads to successful completion of a challenging task or project.			
9.1.12.F.2: Demonstrate a positive work ethic in various settings, including the classroom and during structured learning experiences.			
21 st Century Interdisciplinary Themes:			
X (lobal Awareness	X Financial economic	business, and entrepreneurial literacy
	ivic Literacy	Health Literacy	

Transfer

Students will be able to independently use their learning to...

- T1. Communicate about ideas in Algebra in a standard and understandable manner T2. Relate the topics learned in Algebra to things that they do in their everyday lives
- T3. Analyze real life situations in a mathematical way
- T4. Become proficient in daily skills involving mathematics

Meaning		
Understandings	Essential Questions	
Students will understand that	Students will keep considering	
 U1. Exponential relationships can be represented algebraically, in words, as a table of values, as an ordered pair, and graphically. U2. Scientific notation is a shorthand way to write numbers using powers of 10. U3. Properties of exponents make it easier to simplify products or quotients of powers with the same base or powers raised to a power or products raised to a power. U4. The exponential family of functions can model growth or decay of an initial amount. 	 Q1. How does scientific notation aid in the representation of very large and very small numbers? Q2. How can you simplify expressions involving exponents? Q3. What are the characteristics of exponential functions? Q4. What are the characteristics of real life relationships that can be modeled with exponential functions 	
Acquisition		
Knowledge Students will know	Skills Students will be able	
 K1. Zero and Negative Exponents K2. Scientific Notation K3. Multiplying Powers With the Same Base K4. More Multiplication Properties of Exponents K5. Division Properties of Exponents K6. Exponential Functions K7. Exponential Growth and Decay 	 S1. To simplify expressions involving zero and negative exponents. S2. To write numbers in scientific and standard notation. S3. To compare and order numbers using scientific notation. S4. To multiply powers with the same base. S5. To raise a power to a power. S6. To raise a product to a power. S7. To divide powers with the same base. S8. To raise a quotient to a power. S9. To evaluate and graph exponential functions. S10. To model exponential growth and decay. 	
Evidence (Stage 2)		
-------------------------	---	---
Checks for Alignment	Evaluation Criteria Performance is judged in terms of	Assessment Evidence
T1-T4 U1-U4 Q1-Q4	BLOOMS TAXONOMY RUBRIC	Transfer Task(s) Formative Book problems, Worksheets, Cooperative Activities, Problem Solving Activities, Do-Now, Closure Activities. Summative Used at the end of identified topics to assess learning Quizzes, Tests, Projects, Presentations
K1-K7 S1-S10	BLOOMS TAXONOMY RUBRIC	Other Evidence Formative Essays Journals Rubrics Reports Other Assessments Summative Pre-assessments Journal entries Informal observations Other

Algebra 1 Grade 8

Curriculum Guide

Learning Plan (Stage 3)				
Checks for alignme and best practice	Checks for alignment Summary of Key Learning Events and Instruction and best practice The teaching and learning needed to achieve the unit goals.			
	Required Activities	Required Resources		
	Student groups will be formed to examine the Challenge problems in the text.	Text: Algebra 1 Pearson		
	Suggested Activities	Suggested Resources		
	Think About a Plan 7-4 PPSW Activity 7-4: "Playing with Properties" OTRC	Text: Algebra 1: Pearson		
	Think About a Plan 7-5 PPSW Puzzle 7-5: "Frontward and Backward" OTRC	Text: Algebra 1: Pearson		
	Concept Byte: "Geometric Sequences" (Pg. 453) Think About a Plan 7-6 PPSW	Text: Algebra 1: Pearson		
	Think About a Plan 7-7 PPSW Game 7-7: "Getting Larger or Getting Smaller?" OTRC	Text: Algebra 1: Pearson		

Strategies for Differentiation		
Students Below Target	Students Meeting or Exceeding Target	
Paired/Group Activity	Role Play	
Guided Practice	SQ3R	
Learning Buddies	Cooperative Learning	
Varied Rubrics	Choice Boards/Menus	
Provide use of choice boards, which contain a variety of skill activities	Independent Study	
Cooperative Learning	Interest Based Mini Lessons	
Small Group Instruction	Skill-Based Mini Lessons	
Visual Cues Found On Worksheets	Tiered Products Activities	
Tier graphic organizers	Projects	
Advance Notice of Assignments	Enrichments worksheets	
Review With Study Skills And Strategies Training	Virtual Classroom	
Test Modifications/Time Extensions	Use Compacting strategy to account for prior student mastery of objectives	
Pretest Students to Assess Key Pre-skills and Background Knowledge	Pretest Students to Assess Key Pre-skills and Background Knowledge	
Provide grouping by difficulty level	Provide grouping by difficulty level	
Provide different demonstrations or models		
Offer choice of response, verbal using numerical representations		
Use story mapping for understanding of word problems		
Use computer software to review and reinforce skills taught		
Assign homework targeted to student need at key points		
Use multiple modes of teacher presentation		
Use think-pair-share groups		
Manipulatives		
Use flash-cards, number line, graph paper		

Title of Unit	Polynomials and Factoring	Grade Level	8
Curriculum Area	Mathematics	Time Frame	
Developed By	M. Kessler		
	Desired Resul	ts (Stage 1)	
	Establishe	d Goals	
Established Goals (G): Common Core State Standards/Technology Standards Algebra: A-APR- 1. Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials. A-APR-B-2 Know and apply the Remainder Theorem: For a polynomial $p(x)$ and a number a, the remainder on division by $x - a$ is $p(a)$, so $p(a) = 0$ if and only if $(x - a)$ is a factor of $p(x)$. A-APR-B-3 Identify zeros of polynomials when suitable factorizations are available, and use the zeros to construct a rough graph of the function defined by the polynomial. A-SSE-3 a. Factor a quadratic expression to reveal the zeros of the function it defines. A-SSE-2 Use the structure of an expression to identify ways to rewrite it. For example, see $x4 - y4$ as $(x2)2 - (y2)2$, thus recognizing it as a difference of squares that can be factored as $(x2 - y2)(x2 + y2)$. Functions: F-IF-8 a. Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context			
Primary Interdisciplinary Connections			
 8.1.12.A.3: Participate in online courses, learning communities, social networks, or virtual worlds and recognize them as resources for lifelong learning. 8.1.12.F.2: Analyze the capabilities and limitations of current and emerging technology resources and assess their potential to address educational, career, personal, and social needs. 9.1.12.A.1: Apply critical thinking and problem-solving strategies during structured learning experiences. 9.1.12.A.2: Participate in online strategy and planning sessions for course-based, school-based, or outside projects. 9.1.12.B.1: Present resources and data in a format that effectively communicates the meaning of the data and its implications for solving problems, using multiple perspectives. 9.1.12.C.4: Demonstrate leadership and collaborative skills when participating in online learning communities and structured learning experiences. 9.1.12.C.5: Assume a leadership position by guiding the thinking of peers in a direction that leads to successful completion of a challenging task or project. 9.1.12.F.2: Demonstrate a positive work ethic in various settings, including the classroom and during structured learning experiences. 			
21st Century Interdisciplinary Themes: XGlobal Awareness XFinancial, economic, business, and entrepreneurial literacy Civic Literacy Health Literacy			

Transfer

Students will be able to independently use their learning to...

- T1. Communicate about ideas in Algebra in a standard and understandable manner
- T2. Relate the topics learned in Algebra to things that they do in their everyday lives
- T3. Analyze real life situations in a mathematical way
- T4. Become proficient in daily skills involving mathematics

Meaning		
Understandings	Essential Questions	
Students will understand that	Students will keep considering	
 U1. Monomials can be used to form larger expressions called polynomials. U2. Polynomials can be added and subtracted. U3. There are several ways to find the product of two binomials, including models, algebra, and tables. U4. The properties of real numbers (including multiplication and factoring) can be used to transform monomial and polynomial expressions. 	 Q1. How can two algebraic expressions that appear to be different be equivalent? Q2. How are the properties of real numbers related to polynomials? Q3. What patterns and characteristics can you observe in expressions when multiplying / factoring? 	
Acquis	ition	
Knowledge Students will know	Skills Students will be able	
K1. Adding and Subtracting Polynomials K2. Multiplying and Factoring K3. Multiplying Binomials K4. Multiplying Special Cases K5. Factoring $x^2 + bx + c$ K6. Factoring $ax^2 + bx + c$ K7. Factoring Special Cases K8. Factoring by Grouping	S1. To classify, add, and subtract polynomials. S2. To multiply a monomial by a polynomial. S3. To factor a monomial from a polynomial. S4. To multiply two binomials or a binomial by a trinomial. S5. To find the square of a binomial and to find the product of a sum and difference. S6. To factor trinomials of the form $x^2 + bx + c$. S7. To factor trinomials of the form $ax^2 + bx + c$. S8. To factor perfect-square trinomials and the differences of two squares. S9. To factor higher-degree polynomials by grouping.	

Evidence (Stage 2)		
Checks for Alignment	Evaluation Criteria Performance is judged in terms of	Assessment Evidence
T1-T4 U1-U4 Q1-Q3	BLOOMS TAXONOMY RUBRIC	Transfer Task(s) Formative Book problems, Worksheets, Cooperative Activities, Problem Solving Activities, Do-Now, Closure Activities. Summative Used at the end of identified topics to assess learning Quizzes, Tests, Projects, Presentations
K1-K8 S1-S9	BLOOMS TAXONOMY RUBRIC	Other Evidence Formative Essays Journals Rubrics Reports Other Assessments Summative Pre-assessments Journal entries Informal observations Other

Algebra 1 Grade 8

Curriculum Guide

Learning Plan (Stage 3)		
Checks for alignme	nt Summary of Key Learr	ning Events and Instruction
and best practice	The teaching and learnin	g needed to achieve the unit goals.
	Required Activities	Required Resources
	Student groups will be formed to examine the Challenge problems in the text.	Text: Algebra 1 Pearson
	Suggested Activities	Suggested Resources
	Think About a Plan 8-1 PPSW Puzzle 8-1; "Polynomial Search" OTRC	Text: Algebra 1: Pearson
	Enrichment 8-2 AIORO Think About a Plan 8-2 PPSW	Text: Algebra 1: Pearson
	Concept Byte: "Using Models to Multiply" (Pg.485) Think About a Plan 8-3 Puzzle 8-3: "The Binomial Code" OTRC	Text: Algebra 1: Pearson
	Enrichment 8-4 AIORO Think About a Plan 8-4 PPSW	Text: Algebra 1: Pearson
	Concept Byte 8-5: "Using Models to Factor" (Pg. 499) Think About a Plan 8-5 PPSW Game 8-5: "Factoring" OTRC	Text: Algebra 1: Pearson
	Think About a Plan 8-6 PPSW Game 8-6: "One From Column A, One From Column B" OTRC	Text: Algebra 1: Pearson
	Think About a Plan 8-7 PPSW	Text: Algebra 1: Pearson

Strategies for Differentiation		
Students Below Target	Students Meeting or Exceeding Target	
Deirod/Croup Activity	Dala Dlav	
Guided Practice	SQ3R	
Learning Buddies	Cooperative Learning	
Varied Rubrics	Choice Boards/Menus	
Provide use of choice boards, which contain a variety of skill activities	Independent Study	
Cooperative Learning	Interest Based Mini Lessons	
Small Group Instruction	Skill-Based Mini Lessons	
Visual Cues Found On Worksheets	Tiered Products Activities	
Tier graphic organizers	Projects	
Advance Notice of Assignments	Enrichments worksheets	
Review With Study Skills And Strategies Training	Virtual Classroom	
Test Modifications/Time Extensions	Use Compacting strategy to account for prior student mastery of objectives	
Pretest Students to Assess Key Pre-skills and Background Knowledge	Pretest Students to Assess Key Pre-skills and Background Knowledge	
Provide grouping by difficulty level	Provide grouping by difficulty level	
Provide different demonstrations or models		
Offer choice of response, verbal using numerical representations		
Use story mapping for understanding of word problems		
Use computer software to review and reinforce skills taught		
Assign homework targeted to student need at key points		
Use multiple modes of teacher presentation		
Use think-pair-share groups		
Manipulatives		
Use flash-cards, number line, graph paper		

Title of Unit	Quadratic Functions and Equations	Grade Level	8
Curriculum Area	Mathematics	Time Frame	
Developed By	M. Kessler		
	Desired Result	ts (Stage 1)	
	Establishe	d Goals	
Established Goals (G): Common Core State Standards/Technology Standards Functions: F-IF-7 a. Graph linear and quadratic functions and show intercepts, maxima, and minima. F-IF-7 d. Graph rational functions, identifying zeros and asymptotes when suitable factorizations are available, and showing end behavior. F-IF-8 a. Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context. F-LE-1 Distinguish between situations that can be modeled with linear functions and with exponential functions. Algebra: A-REI- 4-b. Solve quadratic equations by inspection (e.g., for $x2 = 49$), taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions and write them as $a \pm bi$ for real numbers <i>a</i> and <i>b</i> . A-REI- 6. Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables. A-REI-11 Explain why the <i>x</i> -coordinates of the points where the graphs of the equations $y = f(x)$ and $y = g(x)$ intersect are the solutions of the equation $f(x) = g(x)$; find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where $f(x)$ and/or $g(x)$ are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.			
Primary Interdisciplinary Connections			
 8.1.12.A.3: Participate in online courses, learning communities, social networks, or virtual worlds and recognize them as resources for lifelong learning. 8.1.12.F.2: Analyze the capabilities and limitations of current and emerging technology resources and assess their potential to address educational, career, personal, and social needs. 9.1.12.A.1: Apply critical thinking and problem-solving strategies during structured learning experiences. 9.1.12.A.2: Participate in online strategy and planning sessions for course-based, school-based, or outside projects. 9.1.12.B.1: Present resources and data in a format that effectively communicates the meaning of the data and its implications for solving problems, using multiple perspectives. 9.1.12.C.4: Demonstrate leadership and collaborative skills when participating in online learning communities and structured learning experiences. 9.1.12.C.5: Assume a leadership position by guiding the thinking of peers in a direction that leads to successful completion of a challenging task or project. 9.1.12.F.2: Demonstrate a positive work ethic in various settings, including the classroom and during structured learning experiences. 			

21st Century Interdisciplinary Themes:

___X__ Global Awareness _____ Civic Literacy ____X___ Financial, economic, business, and entrepreneurial literacy ______ Health Literacy

Transfer

Students will be able to independently use their learning to...

- T1. Communicate about ideas in Algebra in a standard and understandable manner
- T2. Relate the topics learned in Algebra to things that they do in their everyday lives
- T3. Analyze real life situations in a mathematical way
- T4. Become proficient in daily skills involving mathematics

Meaning		
Understandings	Essential Questions	
Students will understand that	Students will keep considering	
 U1. Quadratic equations can be solved by a variety of methods, including graphing, quadratic equation, factoring, and finding square roots. U2. You can use linear, quadratic, or exponential functions you have studied to model some sets of data. U3. You can solve systems of linear and quadratic equations graphically and algebraically. This type of system can have two solutions, one solution, or no solutions. 	Q1. What are the characteristics of quadratic functions?Q2. How can you solve a quadratic equation?Q3. Why might you select one method of solving a quadratic function over another?Q4. How can you use functions to model real-world situations?	
Acquis	ition	
Knowledge Students will know	Skills Students will be able	
 K1. Quadratic Graphs and Their Properties K2. Quadratic Functions K3. Solving Quadratic Equations K4. Factoring to Solve Quadratic Equations K5. Completing the Square K6. The Quadratic Formula and the Discriminant K7. Linear, Quadratic, and Exponential Models K8. Systems of Linear and Quadratic Equations 	 S1. To graph quadratic functions of the form y=ax^2 and y=ax^2+c S2. To graph quadratic functions of the form y=ax^2+bx+c S3. To solve quadratic equations by graphing and using square roots S4. To solve quadratic equations by factoring S5. To solve quadratic equations by completing the square S6. To solve quadratic equations by using the quadratic formula. To find the number of solutions of a quadratic, or exponential model for data S8. To solve systems of linear and quadratic equations 	

Evidence (Stage 2)		
Checks for Alignment	Evaluation Criteria Performance is judged in terms of	Assessment Evidence
T1-T4 U1-U3 Q1-Q4	BLOOMS TAXONOMY RUBRIC	Transfer Task(s) Formative Book problems, Worksheets, Cooperative Activities, Problem Solving Activities, Do-Now, Closure Activities.
		Summative Used at the end of identified topics to assess learning Quizzes, Tests, Projects, Presentations
K1-K8 S1-S8	BLOOMS TAXONOMY RUBRIC	Other Evidence Formative Essays Journals Rubrics Reports Other Assessments
		Summative Pre-assessments Journal entries Informal observations Other

Algebra 1 Grade 8

Curriculum Guide

Learning Plan (Stage 3)			
Checks for alignmer and best practice	Checks for alignment Summary of Key Learning Events and Instruction The teaching and learning needed to achieve the unit goals.		
	Required Activities	Required Resources	
	Student groups will be formed to examine the Challenge problems in the text.	Text: Algebra 1 Pearson	
	Suggested Activities	Suggested Resources	
	Think About a Plan 9-1 PPSW Puzzle 9-1; "Add 'em Up" OTRC	Text: Algebra 1: Pearson	
	Enrichment 9-2 AIORO Think About a Plan 9-2 PPSW	Text: Algebra 1: Pearson	
	Concept Byte: "Finding Roots" (Pg.554) Think About a Plan 9-3 Activity 9-3: "Which is Which?" OTRC	Text: Algebra 1: Pearson	
	Enrichment 9-4 AIORO Think About a Plan 9-4 PPSW	Text: Algebra 1: Pearson	
	Think About a Plan 9-5 PPSW Activity 9-5: "Square Patterns" OTRC	Text: Algebra 1: Pearson	
	Think About a Plan 9-6 PPSW Game 9-6: "Start your Engines!" OTRC	Text: Algebra 1: Pearson	
	Think About a Plan 9-7 PPSW	Text: Algebra 1: Pearson	
	Think About a Plan 9-8 PPSW Puzzle 9-8: "Get the Point?" OTRC	Text: Algebra 1: Pearson	

Strategies for Differentiation		
Students Below Target	Students Meeting or Exceeding Target	
Paired/Group Activity	Role Play	
Guided Practice	SQ3R	
Learning Buddies	Cooperative Learning	
Varied Rubrics	Choice Boards/Menus	
Provide use of choice boards, which contain a variety of skill activities	Independent Study	
Cooperative Learning	Interest Based Mini Lessons	
Small Group Instruction	Skill-Based Mini Lessons	
Visual Cues Found On Worksheets	Tiered Products Activities	
Tier graphic organizers	Projects	
Advance Notice of Assignments	Enrichments worksheets	
Review With Study Skills And Strategies Training	Virtual Classroom	
Test Modifications/Time Extensions	Use Compacting strategy to account for prior student mastery of objectives	
Pretest Students to Assess Key Pre-skills and Background Knowledge	Pretest Students to Assess Key Pre-skills and Background Knowledge	
Provide grouping by difficulty level	Provide grouping by difficulty level	
Provide different demonstrations or models		
Offer choice of response, verbal using numerical representations		
Use story mapping for understanding of word problems		
Use computer software to review and reinforce skills taught		
Assign homework targeted to student need at key points		
Use multiple modes of teacher presentation		
Use think-pair-share groups		
Manipulatives		
Use flash-cards, number line, graph paper		

Title of Unit	Radical Expressions and Equations	Grade Level	8
Curriculum Area	Mathematics	Time Frame	
Developed By	M. Kessler		
Desired Results (Stage 1)			
Established Goals			

Established Goals (G): Common Core State Standards/Technology Standards

Algebra: A-REI-2. Solve simple rational and radical equations in one variable, and give examples showing how extraneous solutions may arise.

Geometry: G-SRT- 7. Explain and use the relationship between the sine and cosine of complementary angles.

G-SRT-8. Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems.

Number and Quantity: N-RN- 2. Rewrite expressions involving radicals and rational exponents using the properties of exponents.

Functions: F-IF-7b. Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions.

Primary Interdisciplinary Connections

8.1.12.A.3: Participate in online courses, learning communities, social networks, or virtual worlds and recognize them as resources for lifelong learning. **8.1.12.F.2:** Analyze the capabilities and limitations of current and emerging technology resources and assess their potential to address educational, career, personal, and social needs.

9.1.12.A.1: Apply critical thinking and problem-solving strategies during structured learning experiences.

9.1.12.A.2: Participate in online strategy and planning sessions for course-based, school-based, or outside projects.

9.1.12.B.1: Present resources and data in a format that effectively communicates the meaning of the data and its implications for solving problems, using multiple perspectives.

9.1.12.C.4: Demonstrate leadership and collaborative skills when participating in online learning communities and structured learning experiences.

9.1.12.C.5: Assume a leadership position by guiding the thinking of peers in a direction that leads to successful completion of a challenging task or project.

9.1.12.F.2: Demonstrate a positive work ethic in various settings, including the classroom and during structured learning experiences.

21st Century Interdisciplinary Themes: ____X__ Global Awareness _____ Civic Literacy

__X__ Financial, economic, business, and entrepreneurial literacy _____ Health Literacy

Transfer

Students will be able to independently use their learning to...

- T1. Communicate about ideas in Algebra in a standard and understandable manner T2. Relate the topics learned in Algebra to things that they do in their everyday lives
- T3. Analyze real life situations in a mathematical way
- T4. Become proficient in daily skills involving mathematics

Meaning		
Understandings	Essential Questions	
Students will understand that	Students will keep considering	
U1. The lengths of the sides of a right triangle have a special relationship.U2. You can use properties of real numbers to perform operations with radical expressions and solve equations.U3. You can use the sine, cosine, and tangent ratios to find the measurements of sides and angles of right triangles.	Q1. How are radical expressions represented?Q2. What are the characteristics of square root functions?Q3. How can you solve a radical equation?Q4. How a trig functions related to the sides of a right triangle?	
Acquisition		
Knowledge Students will know	Skills Students will be able	
K1. The Pythagorean Theorem K2. Simplifying Radicals K3. Operations With Radical Expressions K4. Solving Radical Equations K5. Graphing Square Root Functions K6. Trigonometric Ratios	 S1. To solve problems using the Pythagorean Theorem. To identify right triangles S2. To simplify radicals involving products and quotients S3. To simplify sums and differences of radical expressions. To simplify products and quotients of radical expressions S4. To solve equations containing radicals. To identify extraneous solutions S5. To graph square root functions. To translate graphs of square root functions S6. To find and use trigonometric ratios 	

Evidence (Stage 2)		
Checks for Alignment	Evaluation Criteria Performance is judged in terms of	Assessment Evidence
T1-T4 U1-U3 Q1-Q4	BLOOMS TAXONOMY RUBRIC	Transfer Task(s) Formative Book problems, Worksheets, Cooperative Activities, Problem Solving Activities, Do-Now, Closure Activities. Summative Used at the end of identified topics to assess learning Quizzes, Tests, Projects, Presentations
K1-K6 S1-S6	BLOOMS TAXONOMY RUBRIC	Other Evidence Formative Essays Journals Rubrics Reports Other Assessments Summative Pre-assessments Journal entries Informal observations Other

Algebra 1 Grade 8

Curriculum Guide

Learning Plan (Stage 3)			
Checks for alignmen and best practice	Checks for alignment Summary of Key Learning Events and Instruction and best practice The teaching and learning needed to achieve the unit goals.		
	Required Activities	Required Resources	
	Student groups will be formed to examine the Challenge problems in the text.	Text: Algebra 1 Pearson	
	Suggested Activities	Suggested Resources	
	Think About a Plan 10-1 PPSW Puzzle 10-1; "Mysterious Triples" OTRC	Text: Algebra 1: Pearson	
	Enrichment 10-2 AIORO Think About a Plan 10-2 PPSW	Text: Algebra 1: Pearson	
	Think About a Plan 10-3 Puzzle 10-3: "Find the Buried Treasure" OTRC	Text: Algebra 1: Pearson	
	Enrichment 10-4 AIORO Think About a Plan 10-4 PPSW	Text: Algebra 1: Pearson	
	Think About a Plan 10-6 PPSW Game 10-6: "Name That Ratio" OTRC	Text: Algebra 1: Pearson	

Strategies for Differentiation		
Students Below Target	Students Meeting or Exceeding Target	
Paired/Group Activity	Role Play	
Guided Practice	SQ3R	
Learning Buddies	Cooperative Learning	
Varied Rubrics	Choice Boards/Menus	
Provide use of choice boards, which contain a variety of skill activities	Independent Study	
Cooperative Learning	Interest Based Mini Lessons	
Small Group Instruction	Skill-Based Mini Lessons	
Visual Cues Found On Worksheets	Tiered Products Activities	
Tier graphic organizers	Projects	
Advance Notice of Assignments	Enrichments worksheets	
Review With Study Skills And Strategies Training	Virtual Classroom	
Test Modifications/Time Extensions	Use Compacting strategy to account for prior student mastery of objectives	
Pretest Students to Assess Key Pre-skills and Background Knowledge	Pretest Students to Assess Key Pre-skills and Background Knowledge	
Provide grouping by difficulty level	Provide grouping by difficulty level	
Provide different demonstrations or models		
Offer choice of response, verbal using numerical representations		
Use story mapping for understanding of word problems		
Use computer software to review and reinforce skills taught		
Assign homework targeted to student need at key points		
Use multiple modes of teacher presentation		
Use think-pair-share groups		
Manipulatives		
Use flash-cards, number line, graph paper		

Title of Unit	Rational Expressions and Functions	Grade Level	9
Curriculum Area	Mathematics	Time Frame	
Developed By	M. Kessler		
Desired Results (Stage 1)			
Established Goals			
Established Goals (G): Common Core State Standards/Technology Standards Algebra: A-REI-2. Solve simple rational and radical equations in one variable, and give examples showing how extraneous solutions may arise. A-APR- 1. Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials. A-APR-B-2 Know and apply the Remainder Theorem: For a polynomial $p(x)$ and a number a, the remainder on division by $x - a$ is $p(a)$, so $p(a) = 0$ if and only if $(x - a)$ is a factor of $p(x)$. A-APR- 6. Rewrite simple rational expressions in different forms; write $a(x)/b(x)$ in the form $q(x) + r(x)/b(x)$, where $a(x)$, $b(x)$, $q(x)$, and $r(x)$ are polynomials with the degree of $r(x)$ less than the degree of $b(x)$, using inspection, long division, or for the more complicated examples, a computer algebra system			

A-APR-7. (+) Understand that rational expressions form a system analogous to the rational numbers, closed under addition, subtraction, multiplication, and division by a nonzero rational expression; add, subtract, multiply, and divide rational expressions.

A-REI-11 Explain why the *x*-coordinates of the points where the graphs of the equations y = f(x) and y = g(x) intersect are the solutions of the equation f(x) = g(x); find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where f(x) and/or g(x) are linear, polynomial, rational, absolute value, exponential, and logarithmic functions. **Functions:** F-IF- a. Graph linear and quadratic functions and show intercepts, maxima, and minima.

F-IF- d. (+) Graph rational functions, identifying zeros and asymptotes when suitable factorizations are available, and showing end behavior.

F-IF-4. For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. *Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.*

Primary Interdisciplinary Connections

8.1.12.A.3: Participate in online courses, learning communities, social networks, or virtual worlds and recognize them as resources for lifelong learning. **8.1.12.F.2:** Analyze the capabilities and limitations of current and emerging technology resources and assess their potential to address educational, career, personal, and social needs.

9.1.12.A.1: Apply critical thinking and problem-solving strategies during structured learning experiences.

9.1.12.A.2: Participate in online strategy and planning sessions for course-based, school-based, or outside projects.

9.1.12.B.1: Present resources and data in a format that effectively communicates the meaning of the data and its implications for solving problems, using multiple perspectives.

9.1.12.C.4: Demonstrate leadership and collaborative skills when participating in online learning communities and structured learning experiences.

9.1.12.C.5: Assume a leadership position by guiding the thinking of peers in a direction that leads to successful completion of a challenging task or project.

9.1.12.F.2: Demonstrate a positive work ethic in various settings, including the classroom and during structured learning experiences.

21 st Century Interdisciplinary Themes: X Global Awareness	X Financial, economic, business, and entrepreneurial literacy
Civic Literacy	Health Literacy

Transfer

Students will be able to independently use their learning to...
T1. Communicate about ideas in Algebra in a standard and understandable manner
T2. Relate the topics learned in Algebra to things that they do in their everyday lives
T3. Analyze real life situations in a mathematical way
T4. Become proficient in daily skills involving mathematics

Meaning		
Understandings	Essential Questions	
Students will understand that	Students will keep considering	
U1. The simplified form of a rational expression is similar to the simplified form of a numerical fraction. U2. Techniques learned with numerical fractions, often apply to rational expressions. U3. Relationships between two variables can sometimes be described as direct or inverse. U4. To graph a rational function $f(x)$, you need to understand the graph's behavior near values of x where the function is undefined.	Q1. How are rational expressions represented?Q2. What are the characteristics of rational functions?Q3. How can you solve a rational equation?Q4. How are rational expressions similar to numerical fractions and in what ways do they differ?	
Acquis	ition	
Knowledge Students will know	Skills Students will be able	
K1. Simplifying Rational Expressions K2. Multiplying and Dividing Rational Expressions K3. Dividing Polynomials K4. Adding and Subtracting Rational Expressions K5. Solving Rational Equations K6. Inverse Variation K7. Graphing Rational Functions	 S1. To simplify rational expressions S2. To multiply and divide rational expressions S3. To divide polynomials S4. To add and subtract rational expressions S5. To solve rational equations and proportions S6. To write and graph equations for inverse variations. S7. To compare direct and inverse variations S8. To graph rational functions S9. To simplify complex fractions 	

Evidence (Stage 2)		
Checks for Alignment	Evaluation Criteria Performance is judged in terms of	Assessment Evidence
T1-T4 U1-U4 Q1-Q4	BLOOMS TAXONOMY RUBRIC	Transfer Task(s) Formative Book problems, Worksheets, Cooperative Activities, Problem Solving Activities, Do-Now, Closure Activities. Summative
		Used at the end of identified topics to assess learning Quizzes, Tests, Projects, Presentations
K1-K7 S1-S9	BLOOMS TAXONOMY RUBRIC	Other Evidence Formative Essays Journals Rubrics Reports Other Assessments
		Summative Pre-assessments Journal entries Informal observations Other

Algebra 1 Grade 8

Curriculum Guide

Learning Plan (Stage 3)			
Checks for alignme and best practice	Checks for alignment Summary of Key Learning Events and Instruction and best practice The teaching and learning needed to achieve the unit goals.		
	Required Activities	Required Resources	
	Student groups will be formed to examine the Challenge problems in the text.	Text: Algebra 1 Pearson	
	Suggested Activities	Suggested Resources	
	Enrichment 11-2 AIORO Think About a Plan 11-2 PPSW	Text: Algebra 1: Pearson	
	Think About a Plan 11-3 Activity 11-3: "Division Square-Off" OTRC	Text: Algebra 1: Pearson	
	Enrichment 11-4 AIORO Think About a Plan 11-4 PPSW	Text: Algebra 1: Pearson	
	Think About a Plan 11-5 PPSW Activity 11-5: "Together or Alone?" OTRC	Text: Algebra 1: Pearson	
	Think About a Plan 11-6 PPSW Game 11-6: "You've Met Your Match!" OTRC	Text: Algebra 1: Pearson	
	Think About a Plan 11-7 PPSW Puzzle 11-7: "Circular Reasoning" OTRC	Text: Algebra 1: Pearson	

Strategies for Differentiation		
Students Below Target	Students Meeting or Exceeding Target	
Paired/Group Activity	Role Play	
Guided Practice	SQ3R	
Learning Buddies	Cooperative Learning	
Varied Rubrics	Choice Boards/Menus	
Provide use of choice boards, which contain a variety of skill activities	Independent Study	
Cooperative Learning	Interest Based Mini Lessons	
Small Group Instruction	Skill-Based Mini Lessons	
Visual Cues Found On Worksheets	Tiered Products Activities	
Tier graphic organizers	Projects	
Advance Notice of Assignments	Enrichments worksheets	
Review With Study Skills And Strategies Training	Virtual Classroom	
Test Modifications/Time Extensions	Use Compacting strategy to account for prior student mastery of objectives	
Pretest Students to Assess Key Pre-skills and Background Knowledge	Pretest Students to Assess Key Pre-skills and Background Knowledge	
Provide grouping by difficulty level	Provide grouping by difficulty level	
Provide different demonstrations or models		
Offer choice of response, verbal using numerical representations		
Use story mapping for understanding of word problems		
Use computer software to review and reinforce skills taught		
Assign homework targeted to student need at key points		
Use multiple modes of teacher presentation		
Use think-pair-share groups		
Manipulatives		
Use flash-cards, number line, graph paper		

Title of Unit	Data Analysis and Probability	Grade Level	8	
Curriculum Area	Mathematics	Time Frame		
Developed By	M. Kessler			
	Desired Resul	ts (Stage 1)		
	Establishe	ed Goals		
Established Goals (G): Common Core State Standards/Technology Standards Statistics and Probability: S-ID- 1. Represent data with plots on the real number line (dot plots, histograms, and box plots). S-ID-2. Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets. S-SC- 4. Use data from a sample survey to estimate a population mean or proportion; develop a margin of error through the use of simulation models for random sampling. S-CP- 6. Find the conditional probability of <i>A</i> given <i>B</i> as the fraction of <i>B</i> 's outcomes that also belong to <i>A</i> , and interpret the answer in terms of the model. S-CP-9. (+) Use permutations and combinations to compute probabilities of compound events and solve problems. S-MD- 4. (+) Develop a probability distribution for a random variable defined for a sample space in which probabilities are assigned empirically; find the expected value. For example, find a current data distribution on the number of TV sets per household in the United States, and calculate the expected number of sets per household. How many TV sets would you expect to find in 100 randomly selected households?				
Primary Interdisciplinary Connections				
 8.1.12.A.3: Participate in online courses, learning communities, social networks, or virtual worlds and recognize them as resources for lifelong learning. 8.1.12.F.2: Analyze the capabilities and limitations of current and emerging technology resources and assess their potential to address educational, career, personal, and social needs. 9.1.12.A.1: Apply critical thinking and problem-solving strategies during structured learning experiences. 9.1.12.A.2: Participate in online strategy and planning sessions for course-based, school-based, or outside projects. 9.1.12.B.1: Present resources and data in a format that effectively communicates the meaning of the data and its implications for solving problems, using multiple perspectives. 9.1.12.C.4: Demonstrate leadership and collaborative skills when participating in online learning communities and structured learning experiences. 9.1.12.C.5: Assume a leadership position by guiding the thinking of peers in a direction that leads to successful completion of a challenging task or project. 9.1.12.F.2: Demonstrate a positive work ethic in various settings, including the classroom and during structured learning experiences. 				
21 st Century Interdisciplinary Themes: X Global AwarenessX Financial, economic, business, and entrepreneurial literacy Civic Literacy Health Literacy				

Transfer

Students will be able to independently use their learning to...

- T1. Communicate about ideas in Algebra in a standard and understandable manner T2. Relate the topics learned in Algebra to things that they do in their everyday lives
- T3. Analyze real life situations in a mathematical way
- T4. Become proficient in daily skills involving mathematics

Meaning			
Understandings	Essential Questions		
Students will understand that	Students will keep considering		
 U1. You can use different measures to interpret and compare sets of data. U2. Separating data into subsets is a useful way to summarize and compare data sets. U3. When collecting data to solve a problem, you need to make sure that your methods are fair and that you accurately represent the results. U4. The probability of an event, or <i>P</i>(event), tells you how likely it is that the event will occur. U5. You can find probabilities by reasoning mathematically or by using data collected from an experiment. U6. You can write the probability of a compound event as an expression involving probabilities of simpler events. 	Q1. How can collecting and analyzing data help you make decisions or predictions?Q2. How can you make and interpret different representations of data?Q3. How is probability related to real-world events?		
Acquis	ition		
Knowledge Students will know	Skills Students will be able		
 K1. Frequency and Histograms K2. Measures of Central Tendency and Dispersion K3. Box-and-Whisker Plots K4. Samples and Surveys K5. Permutations and Combinations K6. Theoretical and Experimental Probability K7. Probability of Compound Events 	 S1. To make and interpret frequency tables and histograms S2. To find mean, median, mode, and range S3. To make and interpret box-and-whisker plots. S4. To classify data and analyze samples and surveys S5. To find permutations and combinations S6. To find theoretical and experimental probabilities S7. To find probabilities of mutually exclusive and overlapping events. S8. To find probabilities of independent and dependent events S9.To find quartiles and percentiles 		

Evidence (Stage 2)		
Checks for Alignment	Evaluation Criteria Performance is judged in terms of	Assessment Evidence
T1-T4 U1-U6 Q1-Q3	BLOOMS TAXONOMY RUBRIC	Transfer Task(s) Formative Book problems, Worksheets, Cooperative Activities, Problem Solving Activities, Do-Now, Closure Activities. Summative Used at the end of identified topics to assess learning Quizzes, Tests, Projects, Presentations
K1-K7 S1-S9	BLOOMS TAXONOMY RUBRIC	Other Evidence Formative Essays Journals Rubrics Reports Other Assessments Summative Pre-assessments Journal entries Informal observations Other

Learning Plan (Stage 3)			
Checks for alignmen and best practice	nt Summary of Key Learn The teaching and learnin	ing Events and Instruction g needed to achieve the unit goals.	
	Required Activities	Required Resources	
	Student groups will be formed to examine the Challenge problems in the text.	Text: Algebra 1 Pearson	
	Suggested Activities	Suggested Resources	
	Think About a Plan 12-2 PPSW Puzzle 12-2: "Order in the Court!" OTRC	Text: Algebra 1: Pearson	
	Think About a Plan 12-3 PPSW Concept Byte: "Standard Deviation" (Pg. 733)	Text: Algebra 1: Pearson	
	Think About a Plan 12-4 PPSW Game 12-4: "Show and Tell" OTRC	Text: Algebra 1: Pearson	
	Think About a Plan 12-7 PPSW Activity 12-7: "Probability and Area" OTRC	Text: Algebra 1: Pearson	
	Think About a Plan 12-8 PPSW Puzzle 12-8: "Hide-and-Seek" OTRC	Text: Algebra 1: Pearson	

Strategies for Differentiation			
Students Below Target	Students Meeting or Exceeding Target		
Paired/Group Activity	Role Play		
Guided Practice	SQ3R		
Learning Buddies	Cooperative Learning		
Varied Rubrics	Choice Boards/Menus		
Provide use of choice boards, which contain a variety of skill activities	Independent Study		
Cooperative Learning	Interest Based Mini Lessons		
Small Group Instruction	Skill-Based Mini Lessons		
Visual Cues Found On Worksheets	Tiered Products Activities		
Tier graphic organizers	Projects		
Advance Notice of Assignments	Enrichments worksheets		
Review With Study Skills And Strategies Training	Virtual Classroom		
Test Modifications/Time Extensions	Use Compacting strategy to account for prior student mastery of objectives		
Pretest Students to Assess Key Pre-skills and Background Knowledge	Pretest Students to Assess Key Pre-skills and Background Knowledge		
Provide grouping by difficulty level	Provide grouping by difficulty level		
Provide different demonstrations or models			
Offer choice of response, verbal using numerical representations			
Use story mapping for understanding of word problems			
Use computer software to review and reinforce skills taught			
Assign homework targeted to student need at key points			
Use multiple modes of teacher presentation			
Use think-pair-share groups			
Manipulatives			
Use flash-cards, number line, graph paper			

Summative Assessment Sample Questions by Core Content Standard

Content Benchmarks	Examples
O1.a Use properties of number systems within the set of real numbers to verify or refute conjectures or justify reasoning.	Extended Constructed Response (ECR): Which of the following numbers are rational and which are irrational? Explain. $\sqrt{(10)(40)}$, $\sqrt{4^3}$, $2\sqrt{2}$, $\sqrt{49}$
O1.b Use rates, ratios and proportions to solve problems, including measurement problems.	ECR (Calculator Permitted): There are 223 students in the freshman class, 168 in the sophomore class, 173 in the junior class, and 138 in the senior class. The student council has 30 members, with these seats allocated based on the number of students in each class. How many student council members should each class have? Show or explain your work. (<i>Possible Answer: With 702 students in all, that's one representative for every 23.4 or 10 (9.5) 7 (7.2) 7 (7.4) 6 (5.9)</i>)
O1.B1 Describe and distinguish among the various uses of variables, including:	Performance Assessment Task: Every Saturday you play basketball in the local community youth club. At the end of a season after a club tournament, the players in the club meet at a fast-food restaurant for a party. If hamburgers cost 59 cents each, find a way to determine the total cost of hamburgers when various numbers of players in the club each have a hamburger (NCTM <i>Illuminations</i>).
O1.B2 Use matrices to represent and solve problems.	SCR: Solve for a, b and c: [1 2 3] + 2[a b c] = [7, 8, 9] (<i>Answer: a = 3, b = 3, c = 3</i>)
O1.c & O2.a Apply the laws of exponents to numerical and algebraic expressions with integral exponents to rewrite them in different but equivalent forms or to solve problems.	SCR: Write the expression in simplest form. $(2a^2b^3)^5$
O1.d & O2.d Use the properties of radicals to convert numerical or algebraic expressions containing square roots in different but equivalent forms or to solve problems.	ECR: Rewrite the radicals to determine the sum of $\sqrt{8} + \sqrt{18}$
O2.b Add, subtract and multiply polynomial expressions.	

	ECR: Subtract: $3x^{5}(x-2) - 2x^{4}(x^{2}+2)$
O2.c Factor simple polynomial expressions.	ECR: Factor completely: $6u^5 - 15u^3$
L1.a Recognize, describe and represent linear relationships using words, tables, numerical patterns, graphs and equations.	SCR: Given the sequence: 5, 7, 9, 11, If 5 is considered the first term, what linear expression could generate this pattern?
L1.b Describe, analyze and use key characteristics of linear functions and their graphs.	SCR: Write an equation for a line parallel to the line through (1, -2) and (-3, 5).
L1.c Graph the absolute value of a linear function and determine and analyze its key characteristics.	ECR: Graph each of the following absolute value equations and compare and contrast the graphs with the graph of $p(x) = x $:
	q(x) = - x , r(x) = 2x , s(x) = x+2 , and t(x) = x +2
L1.d Recognize, express and solve problems that can be modeled using linear functions. Interpret solutions in terms of the context of the problem.	SCR: The linear function 40t=d can be used to describe the motion of a certain car, where t represents the time in hours and d represents distance traveled, in miles. What does the coefficient, 40, represent in the equation? Include units with the answer.
L2.a Solve single-variable linear equations and inequalities with rational coefficients.	MC: Which of the following equations has no solution? A. $x + 0 = x$ B. $y + 1 = 2x$ * C. $x + 4 = x$ D. $3x = 9$
L2.b Solve equations involving the absolute value of a linear expression.	Example: <i>Solve:</i> $ x + 3 = 7$
L2.c Graph and analyze the graph of the solution set of a two- variable linear inequality.	SCR: Graph $5x - y \ge 3$
L2.d Solve systems of linear equations in two variables using algebraic and graphic procedures.	ECR: Solve the linear system by the method that you think is best. Show or explain your work. Explain why you chose that method. 7x - 8y = 6 4x + y = 9
L2.e Recognize, express and solve problems that can be modeled using single-variable linear equations; one- or two-	MC (Non-Calculator): A triangle is formed by the

variable inequalities; or two-variable systems of linear equations.	intersections of the x-axis, the y-axis, and the line $2x + 3y = 6$. What is the area of the triangle? A. $\frac{4}{3}$ B. 2 * C. 3 D. 6
 N1.a Recognize, describe, represent and analyze a quadratic function using words, tables, graphs or equations. N1.b Analyze a table, numerical pattern, graph, equation or context to determine whether a linear, quadratic or exponential relationship could be represented. N1.c Recognize and solve problems that can be modeled using a quadratic function. Interpret the solution in terms of the context of the original problem. 	SCR: Determine the vertex of the function $f(x)=4x^2 - 8x-5$ ECR: Given the following increasing numerical pattern, determine the type of relationship that exists (linear, quadratic or exponential) and justify your conclusion. 3, 6, 12, 24, 48, SCR: A hiker accidentally drops a full water bottle off of a bridge. How many seconds will it take to bit the water?
	Assuming the bottle drops from a height of 300 feet, the model for the height of the bottle at time t is $h = -16t^2 + 300$
N2.a Solve equations involving several variables for one variable in terms of the others.	
	SCR: Solve for y: $z = 3x^2 y + 4y$
N2.b Solve single-variable quadratic equations. N2B1. Provide and describe multiple representations of solutions to simple exponential equations using concrete models, tables, graphs, symbolic expressions, and technology.	SCR (Non-Calculator): Solve the following for x: $3x^2 - x - 10 = -8$ ECR: Using a table, graph, and/or symbolic expressions, solve the following equation. Provide more than one representation of the solutions and explain your work.
	$32 = 2^{x}$
D1.a. Interpret and compare linear models for data that exhibit a linear trend in the context of a problem.	ECR: If a linear trend describes population growth in a small town over 5 years, explain why it would not be best to use the same linear trend to predict population in the town after 100
D1.b Use measures of center and spread to compare and analyze data sets.	SCR (Calculator permitted): A student has scores of 78, 82, 91, 84, and 67 on the first five tests in a semester. What score must she earn on the sixth test in order to raise her average to 82? Show or explain your work.
in the media.	Performance Assessment Task: Find a graph in your local newspaper which provides data you expect to use for a social

D2.a Use counting principles to determine the number of ways	studies paper. Describe the data presented. Tell whether the graph is misleading or fair and how you know.
an event can occur. Interpret and justify solutions.	ECR (Non-Calculator): Compare the number of ways the
	letters of the words FROG and DEER can be arranged to form unique four-letter sequences (e.g., to form different passwords). Explain your answer.
D2.b Apply probability concepts to determine the likelihood an	
event will occur in practical situations.	SCR: If there are 4 brown, 4 black, and 4 blue socks in a drawer, what is the probability that a matched pair will be selected when drawing out first one and then another, without replacing the first sock or being able to see the socks as they are drawn?

***ECR = Extended Constructed Response ***SCR = Short Constructed Response ***MC = Multiple Choice

Resources

Text(s): Algebra 1, Prentice Hall Pearson, 2011

Films, Supplemental Readings, etc.

Established Goals: New Jersey Core Curriculum Content Standards Common Core State Standards for Mathematics

http://www.state.nj.us/education/cccs/2009/

http://www.corestandards.org/assets/CCSSI_Math%20Standards.pdf

ALGEBRA 1 PACING GUIDE			
UNIT 1 - FOUNDATIONS FOR ALGEBRA	# OF DAYS ALG 1 CP	# OF DAYS APPLIED ALGEBRA 1	# OF DAYS 8™ GRADE ALGEBRA
1-1 Variables and Expressions	NA	4	1/2
1-2 Order of Operations and Evaluating Expressions	NA	4	1/2
1-3 Real Numbers and the Number Line	NA	4	0
1-4 - Properties of Real Numbers	NA	0	0
1-5 Adding and Subtracting Real Numbers	NA	0	0
1-6 Multiplying and Dividing Real Numbers	NA	0	0
1-7 The Distributive Property	NA	4	2
1-8 An Introduction to Equations	NA	6	0
Assessments	NA	3	2
Total Number of Days	NA	25	6
UNIT 2 - SOLVING EQUATIONS	# OF DAYS ALG 1 CP	# OF DAYS APPLIED ALGEBRA 1	# OF DAYS 8 th GRADE ALGEBRA
2-1 Solving One-Step Equations	NA	4	1
2-2 Solving Two-Step Equations	NA	0	1/2
2-3 Solving Multi-Step Equations	NA	3	1/2
2-4 Solving Equations With Variables on Both Sides	NA	6	1
2-5 Literal Equations and Formulas	NA	0	0
2-6 Ratios, Rates, and Conversions	NA	0	0
2-7 Solving Proportions	NA	4	0
2-8 Proportions and Similar Figures	NA	0	0
2.9 Percents	NA	0	0
2-10 Change Expressed as a Percent	NA	9	0
Assessments	NA	5	2
Total Number of Days	NA	31	5

UNIT 3 - SOLVING INEQUALITIES	# OF DAYS ALG 1 CP	# OF DAYS APPLIED ALGEBRA 1	# OF DAYS 8 th GRADE ALGEBRA
3-1 Inequalities and Their Graphs	1	0	1
3-2 Solving Inequalities Using Addition or Subtraction	1	3	1/2
3-3 Solving Inequalities Using Multiplication or Division	1	3	1/2
3-4 Solving Multi-Step Inequalities	2	3	1
3-6 Compound Inequalities	2	8	1
3-7 Absolute Value Equations and Inequalities	3	0	1
Assessments	2	3	2
Total Number of Days	13	20	7

UNIT 12 - DATA ANALYSIS AND PROBABILITY	# OF DAYS ALG 1 CP	# OF DAYS APPLIED ALGEBRA 1	# OF DAYS 8 th GRADE ALGEBRA
12-1 Organizing Data Using Matrices	1	NA	0
12-2 Frequency and Histograms	1	NA	1
12-3 Measures of Central Tendency and Dispersion	2	NA	1
12-4 Box and Whisker Plots	1	NA	1
12-5 Samples and Surveys	1	NA	0
12-6 Permutations and Combinations	2	NA	0
12-7 Theoretical and Experimental Probability	2	NA	1
12-8 Probability of Compound Events	2	NA	1
Assessments	2	NA	2
Total Number of Days	15	NA	7

UNIT 4 - AN INTRODUCTION TO FUNCTIONS	# OF DAYS ALG 1 CP	# OF DAYS APPLIED ALGEBRA 1	# OF DAYS 8 th GRADE ALGEBRA
4-1 Using Graphs to Relate Two Quantities	1	0	0
4-2 Patterns and Linear Functions	1	0	1
4-3 Patterns and Nonlinear Functions	1	0	1
4-4 Graphing a Function Rule	2	0	1
4-5 Writing a Function Rule	1	0	0
4-6 Formalizing Relations and Functions	2	2	1
4-7 Sequences and Functions	2	4	1
Assessments	3	2	2
Total Number of Days	14	8	7
BENCHMARK TEST ADMINISTRATION	2		

UNIT 5 - LINEAR FUNCTIONS	# OF DAYS ALG 1 CP	# OF DAYS APPLIED ALGEBRA 1	# OF DAYS 8 th GRADE ALGEBRA
5-1 Rate of Change and Slope	2	3	0
5-2 Direct Variation	1	0	1/2
5-3 Slope-Intercept Form	3	13	1/2
5-4 Point-Slope Form	3	5	1
5-5 Standard Form	1	0	1
5-6 Parallel and Perpendicular Lines	2	0	1
5-7 Scatter Plots and Trend Lines	2	0	0
5-8 Graphing Absolute Value Functions	2	0	0
Assessments	4	1	2
Total Number of Days	22	22	6
Algebra 1 CP Curriculum Guide

UNIT 6 - SYSTEMS OF EQUATIONS AND INEQUALITIES	# OF DAYS ALG 1 CP	# OF DAYS APPLIED ALGEBRA 1	# OF DAYS 8 th GRADE ALGEBRA
6-1 Solving Systems by Graphing	2	0	1
6-2 Solving Systems Using Substitution	1	0	1
6-3 Solving Systems Using Elimination	3	2	1
6-4 Applications of Linear Systems	2	0	1
6-5 Linear Inequalities	2	0	1
6-6 Systems of Linear Inequalities	2	0	1
Assessments	3	1	2
Total Number of Days	16	3	8
BENCHMARK TEST ADMINISTRATION	2		

# OF DAYS ALG 1 CP	# OF DAYS APPLIED ALGEBRA 1	# OF DAYS 8 th GRADE ALGEBRA
2	3	1
2	5	0
2	0	0
1	0	1/2
2	0	1
2	0	1/2
3	0	1
2	0	1
3	1	2
18	4	7
	# OF DAYS ALG 1 CP 2 2 1 2 2 3 2 3 2 3 18	# OF DAYS ALG 1 CP # OF DAYS APPLIED ALGEBRA 1 2 3 2 0 1 0 2 0 2 0 3 0 2 0 3 1 18 4

Algebra 1 CP Curriculum Guide

UNIT 8 - POLYNOMIALS AND FACTORING	# OF DAYS ALG 1 CP	# OF DAYS APPLIED ALGEBRA 1	# OF DAYS 8 th GRADE ALGEBRA
8-1 Adding and Subtracting Polynomials	2	9	0
8-2 Multiplying and Factoring	2	5	1
8-3 Multiplying Binomials	2	11	1
8-4 Multiplying Special Cases	2	3	0
8-5 Factoring Quadratics When "a" = 1	1	0	1
8-6 Factoring Quadratics With "a" Not Equal	2	0	1
to 1			
8-7 Factoring Special Cases	1	0	1
8-8 Factoring by Grouping	1	0	0
Assessments	3	4	2
Total Number of Days	17	32	7
BENCHMARK TEST ADMINISTRATION	2		

UNIT 9 - QUADRATIC FUNCTIONS AND EQUATIONS	# OF DAYS ALG 1 CP	# OF DAYS APPLIED ALGEBRA 1	# OF DAYS 8 th GRADE ALGEBRA
9-1 Quadratic Graphs and Their Properties	1	NA	1/2
9-2 Quadratic Functions	1	NA	1/2
9-3 Solving Quadratic Equations	2	NA	1/2
9-4 Factoring to Solve Quadratic Equations	1	NA	1/2
9-5 Completing the Square	2	NA	1
9-6 The Quadratic Formula and the Discriminant	2	NA	1
9-7 Linear, Quadratic, and Exponential Models	2	NA	1
9-8 Systems of Linear and Quadratic Equations	2	NA	1
Assessments	3	NA	2
Total Number of Days	17	NA	8

Algebra 1 CP Curriculum Guide

UNIT 10 - RADICAL EXPRESSIONS AND EQUATIONS	# OF DAYS ALG 1 CP	# OF DAYS APPLIED ALGEBRA 1	# OF DAYS 8 th GRADE ALGEBRA
10-1 Pythagorean Theorem	2	NA	0
10-2 Simplifying Radicals	2	NA	1
10-3 Operations With Radical Expressions	3	NA	1/2
10-4 Solving Radical Equations	2	NA	1/2
Assessments	3	NA	2
Total Number of Days	13	NA	4
BENCHMARK TEST ADMINISTRATION	2		
UNIT 11 - RATIONAL EXPRESSIONS AND FUNCTIONS	# OF DAYS ALG 1 CP	# OF DAYS APPLIED ALGEBRA 1	# OF DAYS 8 th GRADE ALGEBRA
11-1 Simplifying Rational Expressions	1	0	0
11-2 Multiplying and Dividing Rational Expressions	2	0	1
11-3 Dividing Monomials	0	4	1
11-4 - Adding and Subtracting Rational Expressions	1	0	1
11-5 - Solving Radical Equations	1	0	1
Assessments	1	1	2
Total Number of Days	6	5	6