



**Plainfield Public Schools
Mathematics
Unit Planning Organizer**

Grade/Course	Algebra 1
Unit of Study	Unit 1: Representing Relationships Mathematically: Linear Equations and Inequalities
Pacing	9 Weeks
Dates	September - November, 2016

Standards for Mathematical Practice

CCSSM Mathematical Practices

- MP1. Make sense of problems and persevere in solving them.
- MP2. Reason abstractly and quantitatively.
- MP3. Construct viable arguments and critique the reasoning of others.
- MP4. Model with mathematics.
- MP5. Use appropriate tools strategically.
- MP6. Attend to precision.
- MP7. Look for and make use of structure.
- MP8. Look for and express regularity in repeated reasoning.

I. Unit Vocabulary

UNIT STANDARDS

HSA.SSE.A.1 Interpret expressions that represent a quantity in terms of its context.*

HSA.SSE.A.1.A Interpret parts of an expression, such as terms, factors, and coefficients

HSA.CED.A.1 Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions.

HSA.CED.A.2 Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.

HSA.CED.A.3 Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context.

HSA.CED.A.4 Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. For example, rearrange Ohm's law $V = IR$ to highlight resistance R

A.REI.A.1 Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.

A.REI.B.3 Solve linear equations in one variable, including equations with coefficients represented by letters.

S.ID.C.7 Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.

S.ID.C.8 Compute (using technology) and interpret the correlation coefficient of a linear fit.

S.ID.C.9 Distinguish between correlation and causation.

Supporting Standards:

HSN.Q.A.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.

HSN.Q.A.2 Define appropriate quantities for the purpose of descriptive modeling.

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“Unwrapped” Skills (students need to be able to do)	“Unwrapped” Concepts (students need to know)	DOK Levels
FOCUS STANDARD		
HSA.SSE.A.1 Interpret expressions that represent a quantity in terms of its context.*		
Interpret	Expression,	2

“Unwrapped” Skills (students need to be able to do)	“Unwrapped” Concepts (students need to know)	DOK Levels
FOCUS STANDARD		
HSA.CED.A.1 Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions.		
Create	Equation (linear)	4

“Unwrapped” Skills (students need to be able to do)	“Unwrapped” Concepts (students need to know)	DOK Levels
FOCUS STANDARD		
HSA.CED.A.2 Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.		
Create	Equations	4

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“Unwrapped” Skills (students need to be able to do)	“Unwrapped” Concepts (students need to know)	DOK Levels
FOCUS STANDARD		
HSA.CED.A.3 Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context.		
Represent	Equations	3

“Unwrapped” Skills (students need to be able to do)	“Unwrapped” Concepts (students need to know)	DOK Levels
FOCUS STANDARD		
HSA.CED.A.4 Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. For example, rearrange Ohm's law $V = IR$ to highlight resistance R		
Rearrange	Equations	3

“Unwrapped” Skills (students need to be able to do)	“Unwrapped” Concepts (students need to know)	DOK Levels
FOCUS STANDARD		
A.REI.B.3 Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.		
Solve	Linear equations	2

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“Unwrapped” Skills (students need to be able to do)	“Unwrapped” Concepts (students need to know)	DOK Levels
FOCUS STANDARD		
HSA.REI.D.10 Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line)		
Understand	Graph of an equation	1

“Unwrapped” Skills (students need to be able to do)	“Unwrapped” Concepts (students need to know)	DOK Levels
FOCUS STANDARD		
S.ID.C.7 Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.		
Interpret	Slope Constant	3

“Unwrapped” Skills (students need to be able to do)	“Unwrapped” Concepts (students need to know)	DOK Levels
FOCUS STANDARD		
S.ID.C.8 Compute (using technology) and interpret the correlation coefficient of a linear fit.		
Compute	Coefficient of a linear fit	2

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“Unwrapped” Skills (students need to be able to do)	“Unwrapped” Concepts (students need to know)	DOK Levels
FOCUS STANDARD		
S.ID.C.9 Distinguish between correlation and causation.		
Distinguish	Correlation causation	2

“Unwrapped” Skills (students need to be able to do)	“Unwrapped” Concepts (students need to know)	DOK Levels
SUPPORTING STANDARD:		
HSN.Q.A.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 display		
Use Choose Interpret	Unit Graphs	2 1 3

“Unwrapped” Skills (students need to be able to do)	“Unwrapped” Concepts (students need to know)	DOK Levels
SUPPORTING STANDARD:		
HSN.Q.A.2 Define appropriate quantities for the purpose of descriptive modeling.		
Define	Descriptive Modeling	1

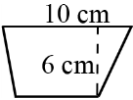
II. Common Core Standards for Mathematics: Explanation and Examples

Number and Quantity: Quantities ★ (N-Q) Reason qualitatively and use units to solve problems.		
<u>Standards</u> <i>Students are expected to:</i>	<u>Mathematical Practices</u>	<u>Explanations and Examples</u>
HS.N-Q.A.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.	<i>HS.MP.4.</i> Model with mathematics. <i>HS.MP.5.</i> Use appropriate tools strategically. <i>HS.MP.6.</i> Attend to precision.	Include word problems where quantities are given in different units, which must be converted to make sense of the problem. For example, a problem might have an object moving 12 feet per second and another at 5 miles per hour. To compare speeds, students convert 12 feet per second to miles per hour: $\frac{12 \text{ ft}}{\text{sec}} \cdot \frac{60 \text{ sec}}{\text{min}} \cdot \frac{60 \text{ min}}{\text{hr}} \cdot \frac{1 \text{ mi}}{5280 \text{ ft}} \approx \frac{8.182 \text{ mi}}{\text{hr}}$ which is more than 5 miles per hour. Graphical representations and data displays include, but are not limited to: line graphs, circle graphs, histograms, multi-line graphs, scatterplots, and multi-bar graphs.
HS.N-Q.A.2 Define appropriate quantities for the purpose of descriptive modeling.	<i>HS.MP.4.</i> Model with mathematics. <i>HS.MP.6.</i> Attend to precision.	Examples: <ul style="list-style-type: none"> ● What type of measurements would one use to determine their income and expenses for one month? ● How could one express the number of accidents in Arizona?

Algebra: Seeing Structure in Expressions (A-SSE)

Interpret the structure of expressions.

<p>HS.A-SSE.A.1 Interpret expressions that represent a quantity in terms of its context.</p>	<p><i>HS.MP.1.</i> Make sense of problems and persevere in solving them.</p>	<p>Students should understand the vocabulary for the parts that make up the whole expression and be able to identify those parts and interpret their meaning in terms of a context.</p>
<p>a. Interpret parts of an expression, such as terms, factors, and coefficients.</p>	<p><i>HS.MP.2.</i> Reason abstractly and quantitatively. <i>HS.MP.4.</i> Model with mathematics. <i>HS.MP.7.</i> Look for and make use of structure.</p>	

Algebra: Creating Equations ★ (A-CED) Create equations that describe numbers or relationships.		
<u>Standards</u> <i>Students are expected to:</i>	<u>Mathematical Practices</u>	<u>Explanations and Examples</u>
<p>HS.A-CED.A.1 Create equations and inequalities in one variable and use them to solve problems. <i>Include equations arising from linear and quadratic functions, and simple rational and exponential functions.</i></p>	<p><i>HS.MP.2.</i> Reason abstractly and quantitatively. <i>HS.MP.4.</i> Model with mathematics. <i>HS.MP.5.</i> Use appropriate tools strategically.</p>	<p>Equations can represent real world and mathematical problems. Include equations and inequalities that arise when comparing the values of two different functions, such as one describing linear growth and one describing exponential growth.</p> <p>Examples:</p> <ul style="list-style-type: none"> Given that the following trapezoid has area 54 cm^2, set up an equation to find the length of the base, and solve the equation. <div style="text-align: center; margin: 10px 0;">  </div> <ul style="list-style-type: none"> Lava coming from the eruption of a volcano follows a parabolic path. The height h in feet of a piece of lava t seconds after it is ejected from the volcano is given by $h(t) = -t^2 + 16t + 936$. After how many seconds does the lava reach its maximum height of 1000 feet?
<p>HS.A-CED.A.2 Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.</p>	<p><i>HS.MP.2.</i> Reason abstractly and quantitatively. <i>HS.MP.4.</i> Model with mathematics. <i>HS.MP.5.</i> Use appropriate tools strategically.</p>	

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<p>HS.A-CED.A.3 Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or non-viable options in a modeling context. <i>For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.</i></p>	<p><i>HS.MP.2.</i> Reason abstractly and quantitatively.</p> <p><i>HS.MP.4.</i> Model with mathematics.</p> <p><i>HS.MP.5.</i> Use appropriate tools strategically.</p>	<p>Example:</p> <ul style="list-style-type: none"> ● A club is selling hats and jackets as a fundraiser. Their budget is \$1500 and they want to order at least 250 items. They must buy at least as many hats as they buy jackets. Each hat costs \$5 and each jacket costs \$8. <ul style="list-style-type: none"> ○ Write a system of inequalities to represent the situation. ○ Graph the inequalities. ○ If the club buys 150 hats and 100 jackets, will the conditions be satisfied? ○ What is the maximum number of jackets they can buy and still meet the conditions?
<p>HS.A-CED.A.4 Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. <i>For example, rearrange Ohm's law $V = IR$ to highlight resistance R.</i></p>	<p><i>HS.MP.2.</i> Reason abstractly and quantitatively.</p> <p><i>HS.MP.4.</i> Model with mathematics.</p> <p><i>HS.MP.5.</i> Use appropriate tools strategically.</p> <p><i>HS.MP.7.</i> Look for and make use of structure.</p>	<p>Examples: The Pythagorean Theorem expresses the relation between the legs a and b of a right triangle and its hypotenuse c with the equation $a^2 + b^2 = c^2$.</p> <ul style="list-style-type: none"> ○ Why might the theorem need to be solved for c? ○ Solve the equation for c and write a problem situation where this form of the equation might be useful. ○ Solve $V = \frac{4}{3}\pi r^3$ for radius r. <ul style="list-style-type: none"> ○ Motion can be described by the formula below, where t = time elapsed, u=initial velocity, a = acceleration, and s = distance traveled <p>$s = ut + \frac{1}{2}at^2$</p> <ul style="list-style-type: none"> ○ Why might the equation need to be rewritten in terms of a? ○ Rewrite the equation in terms of a

Algebra: Reasoning with Equations and Inequalities ★ (A-REI) Represent and solve equations and inequalities graphically.		
<u>Standards</u> <i>Students are expected to:</i>	<u>Mathematical Practices</u>	<u>Explanations and Examples</u>
HS.A-REI.B.3 Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.	<i>HS.MP.2.</i> Reason abstractly and quantitatively. <i>HS.MP.7.</i> Look for and make use of structure. <i>HS.MP.8.</i> Look for and express regularity in repeated reasoning.	Examples: <ul style="list-style-type: none"> • $-\frac{7}{3}y - 8 = 111$ • $3x > 9$ • $ax + 7 = 12$ • $\frac{3+x}{7} = \frac{x-9}{4}$ • Solve for x: $2/3x + 9 < 18$
HS.A-REI.D.10 Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).	<i>HS.MP.2.</i> Reason abstractly and quantitatively. <i>HS.MP.4.</i> Model with mathematics.	Example: <ul style="list-style-type: none"> • Which of the following points is on the circle with equation $(x - 1)^2 + (y + 2)^2 = 5(x - 1)^2 + (y + 2)^2 = 5$? <p>(a) (1, -2) (b) (2, 2) (c) (3, -1) (d) (3, 4)</p>

Statistics and Probability: Interpreting Categorical and Quantitative Data ★(S-ID) Interpret linear models.		
<u>Standards</u> <i>Students are expected to:</i>	<u>Mathematical Practices</u>	<u>Explanations and Examples</u>
HS.S-ID.C.7. Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.	<p><i>HS.MP.1.</i> Make sense of problems and persevere in solving them.</p> <p><i>HS.MP.2.</i> Reason abstractly and quantitatively.</p> <p><i>HS.MP.4.</i> Model with mathematics.</p> <p><i>HS.MP.5.</i> Use appropriate tools strategically.</p> <p><i>HS.MP.6.</i> Attend to precision.</p>	<p>Students may use spreadsheets or graphing calculators to create representations of data sets and create linear models.</p> <p>Example:</p> <ul style="list-style-type: none"> Lisa lights a candle and records its height in inches every hour. The results recorded as (time, height) are (0, 20), (1, 18.3), (2, 16.6), (3, 14.9), (4, 13.2), (5, 11.5), (7, 8.1), (9, 4.7), and (10, 3). Express the candle's height (h) as a function of time (t) and state the meaning of the slope and the intercept in terms of the burning candle. <p>Solution:</p> $h = -1.7t + 20$ <p>Slope: The candle's height decreases by 1.7 inches for each hour it is burning.</p> <p>Intercept: Before the candle begins to burn, its height is 20 inches.</p>

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<p>HS.S-ID.C.8. Compute (using technology) and interpret the correlation coefficient of a linear fit.</p>	<p><i>HS.MP.4. Model with mathematics.</i></p> <p><i>HS.MP.5. Use appropriate tools strategically.</i></p> <p><i>HS.MP.8. Look for and express regularity in repeated reasoning.</i></p>	<p>Students may use spreadsheets, graphing calculators, and statistical software to represent data, describe how the variables are related, fit functions to data, perform regressions, and calculate residuals and correlation coefficients.</p> <p>Example:</p> <ul style="list-style-type: none">• Collect height, shoe-size, and wrist circumference data for each student. Determine the best way to display the data. Answer the following questions: Is there a correlation between any two of the three indicators? Is there a correlation between all three indicators? What patterns and trends are apparent in the data? What inferences can be made from the data?
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Statistics and Probability: Interpreting Categorical and Quantitative Data ★ (S-ID) Interpret linear models.		
<u>Standards</u> <i>Students are expected to:</i>	<u>Mathematical Practices</u>	<u>Explanations and Examples</u>
<p>HS.S-ID.C.9. Distinguish between correlation and causation.</p> <p>Connection: <i>9-10.RST.9</i></p>	<p><i>HS.MP.3.</i> Construct viable arguments and critique the reasoning of others.</p> <p><i>HS.MP.4.</i> Model with mathematics.</p> <p><i>HS.MP.6.</i> Attend to precision.</p>	<p>Some data leads observers to believe that there is a cause and effect relationship when a strong relationship is observed. Students should be careful not to assume that correlation implies causation. The determination that one thing causes another requires a controlled randomized experiment.</p> <p>Example:</p> <ul style="list-style-type: none"> • Diane did a study for a health class about the effects of a student’s end-of-year math test scores on height. Based on a graph of her data, she found that there was a direct relationship between students’ math scores and height. She concluded that “doing well on your end-of-course math tests makes you tall.” Is this conclusion justified? Explain any flaws in Diane’s reasoning.

III. Essential Questions.....Corresponding Big Ideas

Essential Questions	Corresponding Big Ideas
How can expressions be used to model real-world problems?	The mathematical emphasis modeling problem situations using expressions
How can a reason mathematically?	Expression are powerful tools for exploring, reasoning about representing situations
How are relationships represented mathematically?	Two or more expressions may be equivalent, even when their symbolic forms differ. A relatively small number of symbolic transformations can be applied to expressions to yield equivalent expressions.
How are solutions or solution set mean in the context of the problem situation?	Variables have many different meanings, depending on context and purpose.
	Using variables permits writing expressions whose values are not known or vary under different circumstances.
	Using variables permits representing varying quantities.
How can mathematical properties be correctly applied in order to solve literal equations and formulas for a given variable?	This use of variables is particularly important in studying relationships between varying quantities.

The equals sign can indicate that two expressions are equivalent. It is often important to find the value(s) of a variable for which two expressions represent the same quantity. Finding the value(s) of a variable for which two expressions represent the same quantity is know as solving an equation.

The equals sign can be used in defining or giving a name to an expression or function rule.

Sources:

Lloyd, G., Herbel-Eisenmann, B., & Star, J.R. (2011). Developing essential understanding of expressions, equations, and functions for teaching mathematics in grades 6-8. Reston, VA: The National Council of Teachers of Mathematics, Inc.

IV. Student Learning Objectives

Learning Goals	Skills / Concepts	<u>PARCC Evidence Table</u> <u>Mathematics Test</u> <u>Specifications</u>	Mathematical Practices
<p>Solve multi-step problems, using units to guide the solution, interpreting units consistently in formulas and choosing an appropriate level of accuracy on measurement quantities. Develop descriptive models by defining appropriate quantities. N.Q.A.1, N.Q.A.2, N.Q.A.3</p>	<p>Concept(s):</p> <ul style="list-style-type: none"> • Units are associated with variables in expressions and equations in context. • Quantities may be used to model attributes of real world situations. • Measurement tools have an inherent amount of uncertainty in measurement. <p>Students are able to:</p> <ul style="list-style-type: none"> • Use units to understand real world problems. • Use units to guide the solution of multi-step real world problems (e.g. dimensional analysis). • Choose and interpret units while using formulas to solve problems. • Identify and define appropriate quantities for descriptive modeling. • Choose a level of accuracy when reporting measurement quantities. 		<p>MP. 1 MP. 2 MP. 4 MP. 5</p>

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<p>Interpret terms, factors, coefficients, and other parts of expressions in terms of a context. A.SSE.A.1 A.SSE.A.1a,</p>	<p>Students are able to:</p> <ul style="list-style-type: none"> Identify different parts of an expression, including terms, factors and constants. Explain the meaning of parts of an expression in context. 		
<p>Solve linear equations and inequalities in one variable (including literal equations); justify each step in the process A.REI.B.3, A.REI.A.1. A.CED.A.4.</p>	<p>Concept(s).</p> <ul style="list-style-type: none"> Literal equations can be rearranged using the properties of equality. <p>Students are able to.</p> <ul style="list-style-type: none"> Solve linear equations with coefficients represented by letters in one variable. Use the properties of equality to justify steps in solving linear equations. Solve linear inequalities in one variable. Rearrange linear formulas and literal equations, isolating a specific variable. 	<ul style="list-style-type: none"> Tasks do not include absolute value equations or compound inequalities. <ul style="list-style-type: none"> Tasks have a real-world context. The quantity of interest is linear in nature. 	<p>MP. 2 MP. 6 MP. 7</p>
<p>Create linear equations and inequalities in one variable and use them in contextual situations to solve</p>	<p>Concept(s):</p> <ul style="list-style-type: none"> Equations and inequalities describe relationships. Equations can represent real-world and mathematical problems. <p>Students are able to:</p>	<ul style="list-style-type: none"> Solve multi-step contextual word problems with degree of difficulty appropriate to the course, requiring application of course-level knowledge and skills 	<p>MP. 2 MP. 4 MP. 7</p>

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<p>problems. Justify each step in the process and the solution. A.CED.A.1 A.REI.A.1,</p>	<ul style="list-style-type: none"> • Identify and describe relationships between quantities in word problems. • Create linear equations in one variable. • Create linear inequalities in one variable. • Use equations and inequalities to solve real world problems. • Explain each step in the solution process. 	<p>articulated in A-CED, N-Q, A-SSE.3, AREI.6, A-REI.12, A-REI.11-1, limited to linear equations and exponential equations with integer exponents.</p>	
<p>Represent data on a scatter plot, describe how the variables are related and use technology to fit a function to data.</p> <p>Interpret the slope, intercept, and correlation coefficient of a data set of a linear model; distinguish between correlation and causation. S.ID.C.7,S.ID.C.8,S.ID.C.9</p>	<p>Concept(s):</p> <ul style="list-style-type: none"> • Scatter plots represent the relationship between two variables. • Scatter plots can be used to determine the nature of the association between the variables. • Linear models may be developed by fitting a linear function to approximately linear data. • The correlation coefficient represents the strength of a linear association. <p>Students are able to:</p> <ul style="list-style-type: none"> • Distinguish linear models representing approximately linear data from linear. Equations representing “perfectly” linear relationships. 	<ul style="list-style-type: none"> ▪ Tasks should go beyond 6.SP.4 ▪ For tasks that use bivariate data, limit the use of time series. Instead use data that may have variation in the y-values for given x-values, such as pre and post test scores, height and weight, etc. ▪ Predictions should not extrapolate far beyond the set of data provided. ▪ Line of best fit is always based on the 	<p>MP. 1 MP. 2 MP. 4 MP. 5 MP. 6</p>

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	<ul style="list-style-type: none"> • Create a scatter plot and sketch a line of best fit. • Fit a linear function to data using technology. • Solve problems using prediction equations. • Interpret the slope and the intercepts of the linear model in context. • Determine the correlation coefficient for the linear model using technology. • determine the direction and strength of the linear association between two variables 	<p>equation of the least squares regression line either provided or calculated through the use of technology.</p> <ul style="list-style-type: none"> ▪ To investigate associations, students may be asked to evaluate scatter plots that may be provided or created using technology. Evaluation includes shape, direction, strength, presence of outliers, and gaps. ▪ Analysis of residuals may include the identification of a pattern in a residual plot as an indication of a poor fit. 	
<p>Explain why the solutions of the equation $f(x) = g(x)$ are the x-coordinates of the points where the graphs of the</p>	<p>Concept(s):</p> <ul style="list-style-type: none"> • $y = f(x), y = g(x)$ represent a system of equations. • Systems of equations can be solved graphically (8.EE.C.8). <p>Students are able to:</p> <ul style="list-style-type: none"> • explain the relationship between 	<ul style="list-style-type: none"> ▪ Given an equation or system of equations, reason about the number or nature of the solutions 	<p>MP. 1 MP. 3 MP. 5</p>

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<p>linear equations $y=f(x)$ and $y=g(x)$ intersect. ** function notation is not introduced here</p> <p>Find approximate solutions of $f(x) = g(x)$, where $f(x)$ and $g(x)$ are linear functions, by making a table of values, using technology to graph and finding successive approximations.</p> <p>A.REI.D.11</p>	<p>the x-coordinate of a point of intersection and the solution to the equation $f(x) = g(x)$ for linear equations $y = f(x)$ and $y = g(x)$.</p> <ul style="list-style-type: none">• find approximate solutions to the system by making a table of values, graphing, and finding successive approximations.		
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V. Unit Vocabulary

Unit Vocabulary Terms	
Algebraic expression Numerical expression Equivalent expression Evaluate Integers Rational number Irrational number Variable Distributive property Inequality Absolute value' Coefficient Constant Like terms Additive inverse Multiplicative inverse Additive property of equality Division property of equality Formula Identity Inverse operation Multiplication property of equality Subtraction property of equality Equivalent inequalities	Univariate Bivariate Categorical Correlation coefficient Inverse variation Residual Scatterplot Best of line fit Slope Standard deviation Variance Solution of an inequality

VI. Differentiations/Modifications Teaching Strategies

Research Based Effective Teaching Strategies	Modifications (How do I differentiate instruction?)	Special Education	Strategies for English Language Learners
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<p>Task/Activities that solidifies mathematical concepts Use questioning techniques to facilitate learning</p> <p>Reinforcing Effort, Providing Recognition Practice , reinforce and connect to other ideas within mathematics</p> <p>Promotes linguistic and nonlinguistic representations</p> <p>Cooperative Learning Setting Objectives, Providing Feedback</p> <p>Varied opportunities for students to communicate mathematically</p> <p>Use technological and /or physical tools</p>	<p>Modifications Before or after school tutorial program Leveled rubrics Increased intervention Small groups Change in pace Calculators Extended time Alternative assessments Tiered activities/products Color coded notes Use of movements Use any form of technology</p> <p><i>Play a song with a fast tempo (measured in beats per minutes) for 10 second and then for 20 second .Ask students to count the number of beats each time. Help students understand that the n number of beats played is the dependent variable because it is affected by the length of time the song is played. The length of the time is the independent</i></p>	<p>Change in pace Calculators Alternative assessments Accommodations as per IEP Modifications as per IEP Use graphic organizer to clarify mathematical functions for students with processing and organizing difficulties’.</p> <p>Constant review of math concepts to strengthen understanding of prior concepts for difficulties recalling facts.</p> <p>Use self-regulations strategies’ for student to monitor and assess their thinking and performance for difficultly attending to task</p> <p>Cooperative learning (small group, teaming, peer assisted tutoring) to foster communication and strengthen confidence.</p>	<p>Whiteboards Small Group / Triads Word Walls Partially Completed Solution Gestures Native Language Supports Pictures / Photos Partner Work Work Banks Teacher Modeling Math Journals Manipulatives Peer Coach</p> <p>Write the name and examples of each property in unit 1 on the board. Have students who are fluent in languages express properties and their meaning</p>
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<p>21st Century Learning Skills :</p> <p>Teamwork and Collaboration</p> <p>Initiative and Leadership</p> <p>Curiosity and Imagination</p> <p>Innovation and Creativity</p> <p>Critical thinking and Problem Solving</p> <p>Flexibility and Adaptability</p> <p>Effective Oral and Written Communication</p> <p>Accessing and Analyzing Information</p>	<p><i>variable because it is unaffected by the number of beats played</i></p> <p>Extension:</p> <p><i>Have each pair of students draw a side view of one of their sets of stairs. Then have them use a line to represent the slope, connecting the outer edge of each stair. Have them label the rise and run of one stair, and the total rise and run of several stairs. How do the ratios compare? Many communities have constructed ramps so that buildings comply with the Americans with Disabilities Act. Have students research the specs for accessible ramps.</i></p>	<p>Use technology and/or hands on devices to: clarify abstract concepts and process for:</p> <ol style="list-style-type: none"> 1. Difficulty interpreting pictures and diagram. 2. Difficulties with oral communications 3. Difficulty correctly identifying symbols of numeral 4. Difficulty maintaining attentions <p>Simplify and reduces strategies / Goal structure to enhance motivation , foster independence and self-direction for:</p> <ol style="list-style-type: none"> 1. Difficulty attending to task 2. Difficulty with following a sequence of steps to solution. 3. Difficulty processing and organizing <p>Scaffolding math idea/concepts by guided practice and questioning strategies' to clarify and enhance understanding of</p>	
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		<p>math big ideas for:</p> <ol style="list-style-type: none">1. Difficulty with process and organization2. Difficulty with oral and written communication <p>Teacher models strategies' and think out aloud strategies to specify step by step process for:</p> <ol style="list-style-type: none">1. Difficulties processing and organization2. Difficulty attending to tasks. <p>Use bold numbers and/or words to draw students' attention to important information.</p> <p>Provide students with friendly numbers in order to focus on the mathematical concept rather than operations of the problem.</p> <p>Have students note and explain the differences between the use of the symbol (-) for subtraction sentences and for identifying</p>	
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		<p>negative numbers. Help make connections between everyday situations and the use of positive numbers, negative numbers, or zero by making posters depicting different scenarios, example a lemonade stand. Include illustrations and paragraph explaining the situation. Show coins and paper money to illustrate the problem. Represent a loss with (-) and a profit or gain with (+). Then have students solve problems about the scenario.</p>	
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Instructional Resources and Materials	
Formative Assessment	Print
<p>Short constructed responses Extended responses Checks for Understanding Exit tickets Teacher observation Projects Timed Practice Test – Multiple Choice & Open-Ended Questions</p> <p><u>Performance Task</u></p> <p><u>Kitchen Floor Tiles aligned to ASSE.A, ASSE.A1</u></p> <p><u>Coffee and Crime Aligned to Standards S.ID.B6, S.ID.C7, S.ID.C8,S.ID.C9</u></p> <p><u>Summative Assessment:</u></p> <p><u>Algebra 1 End of Unit Assessment</u></p>	<p>Pearson Algebra 1 with Foundation©2011 (middle school) <i>with transitional skills from chapter 1</i></p> <p>Larson Algebra 1 ©2008 (High School)</p> <hr/> <p style="background-color: #cccccc; padding: 2px;">Technology</p> <p><i>*<u>NJ CORE</u></i> <u>Annenberg Learning : Insight into Algebra 1</u> <u>Mathematics Assessment Projects</u> <u>Get the Math</u> <u>Achieve the Core</u> <u>Webmath.com</u> <u>sosmath.com</u> <u>Mathplanet.com</u> <u>Interactive Mathematics.com</u> <u>Illustrative Mathematics</u> <u>Inside Mathmatics.org</u> <u>Asia Pacific Economic Cooperation : :Lesson Study Videos</u> <u>Genderchip.org</u> <u>Interactive Geometry</u> <u>Mathematical Association of America</u> <u>National Council of Teachers of</u></p>

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	<p><u>Mathematics</u> <u>learner.org</u> <u>Math Forum : Teacher Place</u> <u>Shmoop /common core math</u></p>	

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