Readington Township Public Schools

Algebra 1
(Honors 7th and Advanced 8th)

Authored by: Megan Grocholske, Colleen Ogden and Kristi Dauernheim

Reviewed by: Sarah Pauch
Supervisor of Math, Science, and Technology

Approval Date:

Readington Township Public Schools
Whitehouse Station, NJ 08889
www.readington.k12.nj.us

Algebra I Mathematics

Overview

This full-year Algebra 1 course is designed to provide Advanced 8th grade and Honors 7th grade students with the opportunity to be introduced to algebra skills in the areas of linear, exponential, and quadratic functions, while extending their content base and knowledge to include solving, writing and graphing inequalities, solving systems of equations and inequalities, solving exponential equations, simplifying and factoring higher-degree polynomial functions, graphing and solving quadratic equations, simplifying and solving rational exponents and radical functions, calculating probability, and interpreting data analysis and statistics.

In addition to these topics, and in keeping with the New Jersey Student Learning Standards, students will experience the course content as an integrated, useful, and coherent whole, continually refining their abilities to model with mathematics, reason abstractly and quantitatively while attending to precision both in calculations and vocabulary, and to make sense of problem situations as an essential part of the solution process.

STUDENT OUTCOMES

(Linked to New Jersey Student Learning Standards for Mathematics 2016)

Seeing Structure in Expressions **A-SSE**

A. Interpret the structure of expressions

1. Interpret expressions that represent a quantity in terms of its context.
   a. Interpret parts of an expression, such as terms, factors, and coefficients.
   b. Interpret complicated expressions by viewing one or more of their parts as a single entity. For example, interpret P(1+r) n as the product of P and a factor not depending on P 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).

B. Write expressions in equivalent forms to solve problems

3. Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.
   a. Factor a quadratic expression to reveal the zeros of the function it defines.
   b. Complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines.
   c. Use the properties of exponents to transform expressions for exponential functions. For example the expression 1.15t can be rewritten as (1.151/12) 12t ≈1.01212t to reveal the approximate equivalent monthly interest rate if the annual rate is 15%.
4. Derive and/or explain the formula for the sum of a finite geometric series (when the common ratio is not 1), and use the formula to solve problems. For example, calculate mortgage payments.

Arithmetic with Polynomials and Rational Expressions **A -A**

A. Perform arithmetic operations on polynomials

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.

B. Understand the relationship between zeros and factors of polynomials

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).
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.

C. Use polynomial identities to solve problems

4. Prove polynomial identities and use them to describe numerical relationships. For example, the difference of two squares; the sum and difference of two cubes; the polynomial identity (x2 + y2)2 = (x2 – y2)2 + (2xy)2 can be used to generate Pythagorean triples.
5. (+) Know and apply the Binomial Theorem for the expansion of (x + y)n in powers of x and y for a positive integer n, where x and y are any numbers, with coefficients determined for example by Pascal's Triangle.

D. Rewrite rational expressions

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.
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.

Creating Equations **A -CED**

A. Create equations that describe numbers or relationships

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.
2. Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.
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. For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.
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.

Reasoning with Equations and Inequalities **A -REI**

A. Understand solving equations as a process of reasoning and explain the reasoning

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

B. Solve equations and inequalities in one variable

3. Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.
4. Solve quadratic equations in one variable.
    a. Use the method of completing the square to transform any quadratic equation in x into an equation of the form (x – p)2 = q that has the same solutions. Derive the quadratic formula from this form.
    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 ± bi for real numbers a and b.

C. Solve systems of equations

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.
6. Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.
7. Solve a simple system consisting of a linear equation and a quadratic equation in two variables algebraically and graphically. For example, find the points of intersection between the line y = –3x and the circle x2 + y2 = 3.
8. (+) Represent a system of linear equations as a single matrix equation in a vector variable.
9. (+) Find the inverse of a matrix if it exists and use it to solve systems of linear equations (using technology for matrices of dimension 3 × 3 or greater).

D. Represent and solve equations and inequalities graphically

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).
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.
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 the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes.

Mathematical Practices

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

Strategies

- Teacher presentation
- Teacher read-aloud
- Group discussion
- Small Group instruction
- Group presentations
- Interactive Smartboard Lessons
- Partner work
- Museum walks
- Math talk (students explain their thinking)
- Small Group Work
- Daily 5 Math
- Centers/ stations

Accommodations

Accommodations and Modification Addendum

Assessments

Formative	Summative

• Independent student work • Ready Classroom Lesson Quizzes • Teacher Observations • Class Participation • Class Discussions • Class Assignments • Homework Assignments • Notebooks • Anecdotal Records	• Mid-Unit Test • Unit Test
Benchmark	**Alternative**
• I-Ready Diagnostic • Performance Assessments	• Live Online Assessment Tools (Kahoot, Brainpop) • Student Projects • Student Presentations • Self-Assessments
Resources	
Required/Primary	**Supplemental**
• *McDougal Littell Algebra 1.* Larson, R., Boswell, L., Kanold, T.D., & Stiff, L. Copyright 2004 by McDougal Littell, a Houghton Mifflin Company, Evanston, IL.	• Brain Pop • IXL • Reflex Math • Online Tutorials (Learnzillion, Khan Academy, Math Antics) • Online Math Games (Math is Fun, Funbrain, Cool Math Games, Math Playground) • Illustrative Mathematics (www.illustratviemathematics.org) • Explore Learning Gizmos • Estimation 180

Essential Questions And Content

Reasoning With Equations and Inequalities

What can we do with a system of equations/inequalities that we cannot do with a single equation/inequality?

- 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.
- Solve simple rational and radical equations in one variable, and give examples showing how extraneous solutions may arise.
- Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.
- Solve quadratic equations in one variable.
- 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.
- Solve systems of linear equations exactly and approximately, focusing on pairs of linear equations in two variables.
- Solve a simple system consisting of a linear equation and a quadratic equation in two variables algebraically and graphically.
- Represent a system of linear equations as a single matrix equation in a vector variable.
- Find the inverse of a matrix if it exists and use it to solve systems of linear equations.
- 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.
- Explain why the x-coordinates of the points where the graphs of two equations intersect are the solutions of the equation when both are set equal.
- Graph the solutions to a linear inequality in two variables as a half-plane and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes.

Creating Equations

How do we create equations to represent what we see in the real world?

- Create equations and inequalities in one variable and use them to solve problems.
- Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.
- Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in modeling context.
- Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations.

Seeing Structure in Expressions and Writing Equivalent Forms

Why do we need to use exponential notation to model situations?

Why should we factor?

How does the graph of a quadratic function relate to its algebraic equation?

- Interpret and understand the parts of an expression, such as the terms, factors, and coefficients.
- Interpret complicated expressions by viewing one or more of their parts as a single entity. (i.e. P(1+r) as the product of P and a factor not depending on P).
- Using the structure of an expression and properties of operations to rewrite the expression in a different form.
- Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.
- Factor a quadratic expression to reveal the zeros of the function it defines.
- Complete the square in a quadratic expression to reveal the max or min value of the function it defines.
- Use the properties of exponents to transform expressions for exponential functions.
- Derive the formula for the sum of a finite geometric

Arithmetic with Polynomial, Rational, and Radical Expressions

How are rational and irrational numbers the same and different?

Why should we solve rational equations?

- Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication.
- 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).
- Identify zeros of polynomials when suitable factorizations are available, and use the zeroes to construct a rough graph of the function defined by the polynomial.
- Prove polynomial identities and use them to describe numerical relationships.
- Know and apply the Binomial Theorem for the expansion of (x+y) ^n in powers of x and y for a positive integer n, where x and y are any numbers, with coefficients determined for example by Pascal's Triangle.
- Rewrite simple rational expressions in different forms using inspection, long division, or, for the more complicated examples, a computer algebra system.
- Understand that rational expressions form a system analogous to the rational numbers, closed under addition, subtraction, multiplication, and division by a nonzero rational expression.

Pacing and Interdisciplinary Connections

A. Expressions, Equations, and Functions (5 days)

1. Apply Order of Operations
2. Write Expressions
3. Represent Functions as Rules and Tables
4. Represent Functions as Graphs

Interdisciplinary Connections:

NJSLSA.W4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

Activity: Students will create a written summary of key topics and details in this unit, which can be used by other students to learn the material at another time. Students will include practice problems and answer keys. Organization, clear description, proper voice will be important details on which to focus.

B. Properties of Real Numbers (5 days)

1. Use Integers and Rational Numbers
2. Add, Subtract, Multiply, and Divide Real Numbers
3. Apply the Distributive Property
4. Find Square Roots and Compare Real Numbers

Interdisciplinary Connections:

Social Studies

6.3.8.EconET.1: Using quantitative data, evaluate the opportunity cost of a proposed economic action, and take a position and support it (e.g., healthcare, education, transportation).

Activity: Students will consider an improvement they'd like to see at the Middle School and plan a budget. Will consider various stakeholders and develop a proposal which best meets the needs of the parties.

C. Solving Linear Equations (15 days)

1. Solve One-Step Equations
2. Solve Two-Step Equations
3. Solve Multi-Step Equations
4. Solve Equations with Variables on Both Sides
5. Write Ratios and Proportions
6. Solve Proportions Using Cross Products
7. Solve Percent Problems
8. Rewrite Equations and Formulas

Interdisciplinary Connections:

6.3.8.EconET.1: Using quantitative data, evaluate the opportunity cost of a proposed economic action, and take a position and support it (e.g., healthcare, education, transportation).

Activity: Students will use ratios and proportions to analyze the number of people in the district that would meet certain conditions if our school district were representative of the country at large.

D. Graphing Linear Equations and Functions (15 days)

1. Graph Linear Equations
2. Graph Using Intercepts
3. Find Slope and Rate of Change
4. Graph Using Slope-Intercept Form
5. Model Direct Variation
6. Graph Linear Functions

Interdisciplinary Connections:

NJSLS.MATH.CONTENT.HSA.REI.D.10

MSESS2-1 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).

Explanations of stability and change in natural or designed systems can be constructed by examining the changes over time and processes at different scales, including the atomic scale.

Activity: During the course of the problems assigned in this unit, students will meet these interdisciplinary standards. Algebra 1 Chapter 4.

E. Writing Linear Equations (15 days)

1. Write Linear Equations in Slope-Intercept Form
2. Use Linear Equations in Slope-Intercept Form
3. Write Linear Equations in Point-Slope Form
4. Write Linear Equations in Standard Form
5. Write Equations of Parallel and Perpendicular Lines
6. Fit a Line to Data
7. Predict with Linear Models

Interdisciplinary Connections:

Science MS-ETS1 Analyze and interpret data to determine similarities and differences in findings.

Activity: During the course of graphing and writing equations, students will compare/contrast slope, y-intercepts, and their relationships with parallel lines and perpendicular lines. Students will use linear models to make

predictions, based on publicly available data. Chapter 5, with emphasis on Section 5.7 Investigation Algebra Activity & Internet Activity.

F. Solving and Graphing Linear Inequalities (16 days)
1. Solve Inequalities Using Addition and Subtraction
2. Solve Inequalities Using Multiplication and Division
3. Solve Multi-Step Inequalities
4. Solve Compound Inequalities
5. Solve Absolute Value Equations
6. Solve Absolute Value Inequalities
7. Graph Linear Inequalities in Two Variables

Interdisciplinary Connections:
Science MS-ESS-1. Develop and use a model to describe phenomena. (MS-ESS1-1),(MS-ESS1-2)
6.EE.B.6 Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set. (MS-ESS1-2),(MS-ESS1-4) 7.EE.B.4 Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities. (MS-ESS1-2),(MS-ESS1-4)
Activity: During the course of this unit, students will use variables, equations and inequalities to represent real world situations. They will model using graphs and equations. Algebra 1 Chapter 6, with emphasis on Investigating Algebra Activity, page 404.

G. Systems of Equations and Inequalities (15 days)
1. Solve Linear Systems by Graphing
2. Solve Linear Systems by Substitution
3. Solve Linear Systems by Adding or Subtracting
4. Solve Linear Systems by Multiplying First
5. Solve Special Types of Linear Systems
6. Solve Systems of Linear Inequalities

Interdisciplinary Connections:
Science (MS-PS2-1),(MS-PS2-4). Models can be used to represent systems and their interactions—such as inputs, processes and outputs. MP.2 Reason abstractly and quantitatively. (MS-PS2-1),(MS-PS2-2),(MS-PS2-3)
Activity: Use systems of equations to solve problems about traveling with and against a current in a kayak. Algebra 1, page 425.

H. Exponents and Exponential Functions (17 days)
1. Apply Exponent Properties Involving Products
2. Apply Exponent Properties Involving Quotients
3. Define and Use Zero and Negative Exponents
4. Use Scientific Notation
5. Write and Graph Exponential Growth Functions
6. Write and Graph Exponential Decay Functions

Interdisciplinary Connections:
Science (MS-PS1-1) Use numbers expressed in the form of a single digit times an integer power of 10 to estimate very large or very small quantities, and to express how many times as much one is than the other.
Activity: Algebra 1, Section 8.4 problem solving, and Graphing Calculator Activity, Using Scientific Notation, page 519.

I. Polynomials and Factoring (18 days)
1. Add and Subtract Polynomials
2. Multiply Polynomials
3. Find Special Products of Polynomials
4. Solve Polynomial Equations in Factored Form
5. Factor x^2+bx+c
6. Factor ax^2+bx+c
7. Factor Special Products
8. Factor Polynomials Completely

Interdisciplinary Connections:
Science (MS-PS2-3, MS-PS2- 5). Cause and effect relationships may be used to predict phenomena in natural or

designed systems.
Activity: Students will use a polynomial function to model the height of a jumping animal as a function of time. Students can answer the question, "How does changing the initial vertical velocity of an African cat affect its jumping height?" Algebra 1 Page 553.

J. Quadratic Equations and Functions (18 days)
1. Graph $y=ax^2+c$
2. Graph $y=ax^2+bx+c$
3. Solve Quadratic Equations by Graphing
4. Use Square Roots to Solve Quadratic Equations
5. Solve Quadratic Equations by Completing the Square
6. Solve Quadratic Equations by the Quadratic Formula
7. Interpret the Discriminant
8. Compare Linear, Exponential, and Quadratic Models

Interdisciplinary Connections:
Science (MS-PS3-1*)* Construct and interpret graphical displays of data to identify linear and nonlinear relationships. (MS-PS3-1)
Activity: During the course of this unit, students will regularly create and interpret graphs, including features that make them linear or nonlinear relationships. Algebra 1 Section 10.8.

K. Radicals and Geometry Connections (10 days)
1. Graph Square Root Functions
2. Simplify Radical Expressions
3. Solve Radical Equations
4. Apply the Pythagorean Theorem and Its Converse
5. Apply the Distance and Midpoint Formulas

Interdisciplinary Connections:
Social Studies Skill Table - Presentational Skills**:** Present information in a logical manner using evidence and reasoning while demonstrating presentation skills.
Science. (MS-PS2-3, MS-PS2- 5). Cause and effect relationships may be used to predict phenomena in natural or designed systems.
Activity: Students will use radical equations to solve real-world problems and present their solutions to the class, e.g., calculate the length of a sailboat's waterline for a given hull speed. (Page 731).

L. Rational Equations and Functions (14 days)
1. Model Inverse Variation
2. Graph Rational Functions
3. Divide Polynomials
4. Simplify Rational Expressions
5. Multiply and Divide Rational Expressions
6. Add and Subtract Rational Expressions
7. Solve Rational Equations

Interdisciplinary Connections:
Science MS-LS4-2. Apply scientific ideas to construct an explanation for the anatomical similarities and differences among modern organisms and between modern and fossil organisms to infer evolutionary relationships.
Activity: Use graphs of rational functions to describe how a microorganism's efficiency at performing metabolic tasks changes as its dimension change. (Page 763).

M. Probability and Data Analysis (13 days)
1. Find Probabilities and Odds
2. Find Probabilities Using Permutations
3. Find Probabilities Using Combinations
4. Find Probabilities of Compound Events
5. Analyze Surveys and Samples
6. Use Measures of Central Tendency and Dispersion
7. Interpret Stem-and-Leaf Plots and Histograms
8. Interpret Box-and-Whisker Plots

Interdisciplinary Connections:
NJSLSA.W7. Conduct short as well as more sustained research projects, utilizing an inquiry-based research process, based on focused questions, demonstrating understanding of the subject under investigation.
NJSLSA.W8. Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism.
NJSLSA.W9. Draw evidence from literary or informational texts to support analysis, reflection, and research.
Activity*:* Students pick a topic of interest and research. Can be a mathematician or a topic of interest which would lend itself to surveys and the creation of charts and tables to display the results.

Career, Computer Science, and Key Skills

Seeing Structure in Expressions

- **Career Ready Practices**
  - Utilize critical thinking to make sense of problems and persevere in solving them.
    Activity: Problem Solving Workshop, Lesson 1.5. Using Alternative Methods

- **9.2 Career Awareness, Exploration, and Preparation**
  - **9.2.8.CAP.6:** Compare the costs of postsecondary education with the potential increase in income from a career of choice.
    Activity: Graphing Calculator Activity Lesson 1.6 Make a Table.

- **9.4 Life Literacies and Key Skills**
  - **9.4.8.CT.2:** Develop multiple solutions to a problem and evaluate short- and long-term effects to determine the most plausible option.
    Activity: Problem Solving Workshop, Lesson 1.5. Using Alternative Methods

- **Computer Science**
  - **8.1.8.DA.1:** Organize and transform data collected using computational tools to make it usable for a specific purpose.
    Activity: https://im.kendallhunt.com/HS/teachers/1/1/11/preparation.html Comparing and Contrasting Data Displays. Students can use provided data or research public database for live data.

Arithmetic with Polynomials and Rational Expressions

- **Career Ready Practices**
  - Utilize critical thinking to make sense of problems and persevere in solving them.
    Activity: Students will be asked to determine the height of a dropped object t seconds after release given the gravity constant for earth versus the gravity constant for moon. (section 9.4 p. 577).

- **9.2 Career Awareness, Exploration, and Preparation**
  - **9.2.8.CAP.18:** Explain how personal behavior, appearance, attitudes, and other choices may impact the job application process.
    Activity: Students will be asked to create a banner that represents themselves and hang it during a school spirit week. Students will be asked to find the width of one banner when given the length of the rectangle. (section 9.5 p. 590)

- **9.4 Life Literacies and Key Skills**
  - **9.4.8.CI.3:** Examine challenges that may exist in the adoption of new ideas.
  - **9.4.8.TL.3**: Select appropriate tools to organize and present information digitally.
    Activity: Students will be given data to show the number of subscribers to the first U.S. digital satellite radio service for various months after its launch and will be asked to use a graphing calculator to model the quadratic regression. (section 10.8 p. 693)

- **Computer Science**
  - **8.1.8.DA.6:** Analyze climate change computational models and propose refinements.
    Activity: Students will be given climate data and will be asked to use a graphing calculator to model the quadratic regression. (section 10.8 p. 693)

Creating Equations

- **Career Ready Practices**
  - Demonstrate creativity and innovation.
    Activity: https://student.desmos.com/activitybuilder/student/5f089f9293b63626765ea3b5

- **9.2 Career Awareness, Exploration, and Preparation**
  - **9.2.8.CAP.11**: Analyze potential career opportunities by considering different types of resources, including occupation databases, and state and national labor market statistics.
  - **Activity:** Students will use occupation data bases and labor market statistics as the data source for creating equations.

- **9.4 Life Literacies and Key Skills**
  - **9.4.8.CI.1**: Assess data gathered on varying perspectives on causes of climate change (e.g., cross cultural, gender-specific, generational), and determine how the data can best be used to design multiple potential solutions
  - **9.4.8.DC.8**: Explain how communities use data and technology to develop measures to respond to effects of climate change (e.g., smart cities).
  - **9.4.8.IML.15**: Explain ways that individuals may experience the same media message differently.
  - **9.4.8.TL.2**: Gather data and digitally represent information to communicate a real-world problem.
    Activity: Students will analyze data gathered on climate change and use it to generate potential solutions.

- **Computer Science**
  - **8.1.8.DA.1**: Organize and transform data collected using computational tools to make it usable for a specific purpose.
    Activity: Students will use a spreadsheet, with formulas, to evaluate an equation with a number of input values. They will be able to graph the result to show how various equations are represented on a graph. (e.g., page 1 and page 42, Algebra 1).

Reasoning with Equations and Inequalities

- **Career Ready Practices**
  - Utilize critical thinking to make sense of problems and persevere in solving them.
    Activity: Through the daily course work required, students will be expected to clearly articulate, using proper mathematical vocabulary, the impact of slope and y-intercept on a graph, as well as what those values mean in relation to the original problem setting. Students will learn to relate phrases and keywords with their accurate representation as inequalities, including compound inequalities.

- **9.2 Career Awareness, Exploration, and Preparation**
  - **9.2.8.CAP.10**: Evaluate how careers have evolved regionally, nationally, and globally.
    Activity: They will understand how compound inequalities reflect many real life situations and will utilize graphs and accurate vocabulary to describe these situations and their graphs.

- **9.4 Life Literacies and Key Skills**
  - **9.4.8.CT.3**: Compare past problem-solving solutions to local, national, or global issues and analyze the factors that led to a positive or negative outcome.
  - **9.4.8.TL.3**: Select appropriate tools to organize and present information digitally.
  - **9.4.8.IML.12**: Use relevant tools to produce, publish, and deliver information supported with evidence for an authentic audience.
  - **9.4.8.DC.7**: Collaborate within a digital community to create a digital artifact using strategies such as crowdsourcing or digital surveys.

    Activity: Algebra 1, page 342, Internet Activity - Model Data from the Internet

- **Computer Science**
  - **8.1.8.DA.6**: Analyze climate change computational models and propose refinements.
    Activity: Algebra 1, page 342, Internet Activity - Model Data from the Internet (climate change).