Cover Page - Everyday Algebra Curriculum

Content Area: **Mathematics**
Course(s):
Time Period:
Length: **Sample Length**
Status: **Not Published**

Course Overview

Everyday Algebra topics include recognizing and developing patterns using tables, graphs and equations. Mathematical modeling is stressed as a methodology for approaching the solution to problems. Students will explore operations on algebraic expressions and apply mathematical properties to algebraic equations. Students will problem solve using equations, graphs and tables and investigate linear relationships, including comparing and contrasting options and decision-making using algebraic models. Reinforcement of topics from two-dimensional Geometry is integrated into this curriculum. This includes applications from the areas of area and perimeter, the Pythagorean Theorem and its applications, as well as geometric proportion. Finally, students will also study and utilize trigonometric functions to solve for unknowns and implement data analysis and displays to reinforce use of fractions and numerical modeling. Technology will be used to introduce and expand upon the areas of study listed above.

In order to demonstrate a cohesive and complete implementation plan the following general suggestions are provided:

- The use of various formative assessments is encouraged in order to provide an ongoing method of determining the current level of understanding the students have of the material presented.
- Homework, when assigned should be relevant and reflective of the current teaching taking place in the classroom.
- Organizational strategies should be in place that allow the students the ability to take the information gained in the classroom and put in in terms that are relevant to them.
- Instruction should be differentiated to allow students the best opportunity to learn.
- Assessments should be varied and assess topics of instruction delivered in class.
- Modifications to the curriculum should be included that address students with Individualized Educational Plans (IEP), English Language Learners (ELL), and those requiring other modifications (504 plans).

Course Name, Length, Date of Revision and Curriculum Writer

Everyday Algebra

Full Year

June 2024

Lauren Buonpane

Table of Contents

Unit 1: Linear Expressions, Equations, and Inequalities

Content Area: **Mathematics**
Course(s):
Time Period: **1st Marking Period**
Length: **40 Days**
Status: **Published**

Summary of the Unit

In this unit students will solve and graph linear equations and inequalities. Students will use literal equations to solve real-world examples. Students will differentiate between the three common techniques for solving systems of equations which include graphing, substitution, and elimination. Students will then utilize these techniques to solve systems of equations in two and three variables that result in either one solution, no solution, or infinitely many solutions.

Enduring Understandings

- Creating, solving, and analyzing expressions and equations involving arithmetic operations is an essential skill necessary in order to apply mathematics to the real-world.
- The study of linear equations and inequalities allows for identifying and interpreting the relationship between two dependent variables.
- Relationships between two or more functions exists throughout the real-world.

Essential Questions

- How can you use simple and multi-step equations/inequalities to solve real-life problems?
- Given the graph of a linear function, how can you write an equation of the line?
- Can you use linear equations/inequalities to solve real-life problems?
- How can you use substitution/elimination to solve a system of linear equations?
- How can you discover the number of solutions to a linear system?

Summative Assessment and/or Summative Criteria

Summative Assessment and/ or Summative Criteria to demonstrate mastery of the Unit.

- Homework: To be given on each introduced topic/content area
- Class Discussion: Students will be expected to be prepared for class, participate in class activities and actively engage in class discussion.
- Exit Tickets, Writing Prompts, Communicating Your Answers Questions, 3-2-1 Reflection Sheets, Point of Most Significance Questions, Phone Message Activities, etc.: To be given daily on each

introduced topic/content area.
- Teacher Observation: To be done on each introduced topic/content area.
- Students will demonstrate mastery through various assessment criteria within the unit per teacher discretion.

Formative Assessment: To be administered at the close of each topic.

- Quizzes, Projects, Tests and/or Quarterlies: Assessments on the mathematical content of the Everyday Algebra Curriculum
- Students will demonstrate mastery through various assessment criteria within the unit per teacher discretion.

Resources

References:

- Big Ideas Math High School Algebra 1 (2015)
- Big Ideas Math High School Algebra 2 (2015)
- Big Ideas Math High School Geometry (2015)
- New Jersey Student Learning Standards (2023)

Unit Plan

Topic/ Selection	Suggested Timeline per topic	General Objectives	Instructional Activities	Suggested Benchmarks/ Assessments
Solving Simple Equations	2 days	Students will solve simple linear equations using addition, subtraction, multiplication, and division and use these equations to solve real-life problems.	Review all terminology related to solving equations. Have students identify inverse operations. Model example problems. Climate Change Example: Students may create equations and/or inequalities to represent the economic impact of climate change.	Observation Use of technology to support instruction Use of manipulatives to support instruction
Solving	2 days	Students will solve	Review all	Observation

Multi-Step Equations		multi-step linear equations using inverse operations. Students will use multi-step linear equations to solve real-life problems. Students will solve real-world problems.	terminology related to solving equations. Have students identify inverse operations. Model example problems. Climate Change Example: Students may create equations and/or inequalities to represent the economic impact of climate change.	Use of technology to support instruction Use of manipulatives to support instruction Performance Assessment	MA.A MA.A
Solving Equations with Variables on Both Sides	2 days	Students will solve linear equations that have variables on both sides and use linear equations to solve real-life problems. Students will identify special solutions of linear equations.	Review all terminology related to solving equations with variables on both sides of the equation. Model example problems. Climate Change Example: Students may create equations and/or inequalities to represent the economic impact of climate change. Climate Change Example: Students may use units to guide the solution of multi-step problems about how variations in the flow of energy into and out of the Earth's systems result in climate change. Note: Changes in climate are limited to changes in surface temperatures, precipitation patterns, glacial ice volumes, sea levels, and biosphere distribution.	Observation Use of technology to support instruction Use of manipulatives to support instruction	MA.A MA.A

Rewriting Equations and Formulas	2 days	Students will rewrite literal equations.	Review all terminology related to rewriting equations. Model example problems. Climate Change Example: Students may rearrange formulas related to the economic impact of climate change to highlight a quantity of interest, using the same reasoning as in solving equations.	Observation Use of technology to support instruction Use of manipulatives to support instruction Performance Assessment	MA.A
Solving Simple Inequalities	2 days	Students will write, solve, and graph inequalities that involve addition, subtraction, multiplication, and division.	Review all terminology related to solving simple inequalities. Remind students of rules for solving equations. Model example problems. Climate Change Example: Students may create equations and/or inequalities to represent the economic impact of climate change.	Observation Use of technology to support instruction Use of manipulatives to support instruction	MA.A MA.A
Solving Multi-Step Inequalities	2 days	Students will solve multi-step inequalities that involve addition, subtraction, multiplication, and division.	Review all terminology related to solving multi-step inequalities. Remind students of rules for solving multi-step equations. Model example problems. Climate Change	Observation Use of technology to support instruction Performance Assessment	MA.A MA.A

			Example: Students may create equations and/or inequalities to represent the economic impact of climate change.		
Writing and Graphing Linear Equations	5 days	Students will find the slope of a line given two coordinates using the slope equation and from a graph. Students will identify the y-intercept from an equation in slope-intercept form and from a graph. Students will write equations in slope-intercept form given a graph. Students will graph a line given an equation. Students will solve real-world problems.	Review all terminology related to writing and graphing linear equations. Model example problems. Provide or have student discover necessary formulas (slope formula, slope-intercept form).	Written Assessment	MA.A F-IF.B MA.F- MA.F-
Writing and Graphing Linear Inequalities	3 days	Students will graph linear inequalities in two variables. Students will check solutions to linear inequalities. Students will solve real-world problems.	Review all terminology related to writing and graphing linear equations. Refer to/ review rewriting equations in slope-intercept form and graphing linear equations. Model example problems. Climate Change Example: Students may represent constraints describing the economic impact of climate change by equations, inequalities, and/or by systems of	Written Assessment	MA.A MA.A

			inequalities, and interpret solutions as viable or nonviable options.		
Solving Systems of Linear Equations by Graphing	5 days	Students will solve systems of linear equations by graphing. Students will check solutions of systems of linear equations. Students will use systems of linear equations to solve real-life problems.	Review all terminology related to solving systems of linear equations by graphing. Model example problems. Have students discover ways to determine if a system of equations has one solution, no solution, or infinitely many solutions through graphing using teacher chosen/created materials.	Use of technology to support instruction Use of manipulatives to support instruction Performance Assessment	MA. F MA.A
Solving Systems of Linear Equations by Substitution	5 days	Students will solve systems of linear equations by substitution. Students will check solutions of systems of linear equations. Students will use systems of linear equations to solve real-life problems.	Review all terminology related to solving systems of linear equations by substitution. Model example problems. Have students discover ways to determine if a system of equations has one solution, no solution, or infinitely many solutions through substitution using teacher chosen/created materials. Climate Change Example: Students may represent constraints describing the economic impact of climate change by equations,	Use of technology to support instruction Performance Assessment	MA.A MA.A

			inequalities, and/or by systems of inequalities, and interpret solutions as viable or nonviable options.		
Solving Systems of Linear Equations by Elimination	5 days	Students will solve systems of linear equations by elimination. Students will check solutions of systems of linear equations. Students will use systems of linear equations to solve real-life problems.	Review all terminology related to solving systems of linear equations by elimination. Model example problems. Have students discover ways to determine if a system of equations has one solution, no solution, or infinitely many solutions through elimination using teacher chosen/created materials. Climate Change Example: Students may represent constraints describing the economic impact of climate change by equations, inequalities, and/or by systems of inequalities, and interpret solutions as viable or nonviable options.	Observation Use of manipulatives to support instruction Written Assessment	MA.A MA.A MA.A
Solving Linear Systems in 3 Variables	5 days	Students will visualize solutions of systems of linear equations in three variables. Solve systems of linear equations in three variables algebraically. Students will solve real-life problems.	Students will use previous knowledge to match solutions to given systems. Apply substitution and elimination methods where appropriate to solve 3x3 systems. Express given word	Observation Use of technology to support instruction Performance Assessment	MA.N MA.N MA.N

			problems as systems of equations and solve.		

Standards

NJ Student Learning Standards (NJSLS)
MA.A-CED.A.1
MA.A-CED.A.2
MA.A-CED. A.3
MA.A-CED.A.4
MA.A-REI.A.1
MA.A-REI.B.3
MA.A-REI.C.5+
MA.A-REI.C.6+
MA.A-REI.D.12
MA F-IF.B.4
MA.F-IF.C.7a
MA.F-LE.B.5
MA.N-Q.A.1
MA.N-CN.A.1
MA.N-CN.A.2
MA.N-CN.C.7

MATH.9-12.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.
MATH.9-12.N.CN.A.1	Know there is a complex number i such that $i^2 = -1$, and every complex number has the form $a + bi$ with a and b real.
MATH.9-12.N.CN.A.2	Use the relation $i^2 = -1$ and the commutative, associative, and distributive properties to add, subtract, and multiply complex numbers.
MATH.9-12.A.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.
MATH.9-12.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.
MATH.9-12.A.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.
MATH.9-12.A.CED.A.4	Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations.
MATH.9-12.N.CN.C.7	Solve quadratic equations with real coefficients that have complex solutions.
MATH.9-12.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.
MATH.9-12.F.IF.B.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.
MATH.9-12.A.REI.B.3	Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.
MATH.9-12.A.REI.C.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.
MATH.9-12.F.IF.C.7.a	Graph linear and quadratic functions and show intercepts, maxima, and minima.
MATH.9-12.A.REI.C.6	Solve systems of linear equations algebraically (include using the elimination method) and graphically, focusing on pairs of linear equations in two variables.
MATH.9-12.A.REI.D.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.
MATH.9-12.F.LE.B.5	Interpret the parameters in a linear or exponential function in terms of a context.

Suggested Modifications for Special Education, ELL and Gifted Students

- Consistent with individual plans, when appropriate.
- Below-level learners can be provided with graphic organizers, vocabulary cards, study guides, printed notes, and leveled readers. Projects can be modified or leveled as needed.
- Restructure lesson using UDL principals (http://www.cast.org/our-work/about-udl.html#.VXmoXcfD_UA); Structure lessons around questions that are authentic, relate to students' interests, social/family background and knowledge of their community.
- Provide students with multiple choices for how they can represent their understandings (e.g. multisensory techniques-auditory/visual aids; pictures, illustrations, graphs, charts, data tables, multimedia, modeling).
- Provide opportunities for students to connect with people of similar backgrounds (e.g. conversations via digital tool such as SKYPE, experts from the community helping with a project, journal articles, and biographies).
- Provide multiple grouping opportunities for students to share their ideas and to encourage work among various backgrounds and cultures (e.g. multiple representation and multimodal experiences).
- Engage students with a variety of Science and Engineering practices to provide students with multiple entry points and multiple ways to demonstrate their understandings.
- Use project-based science learning to connect science with observable phenomena; Structure the learning around explaining or solving a social or community-based issue.
- Provide ELL students with multiple literacy strategies including websites with various language options.
- Collaborate with after-school programs or clubs to extend learning opportunities.

Suggested Technological Innovations/Use

Bigideasmath.com
Graphing Calculator Investigations

Cross Curricular/Career Readiness, Life Literacies and Key Skills Practice

9.1 21st Century Life and Career Skills: All students will demonstrate the creative, critical thinking, collaboration, and problem-solving skills needed to function successfully as both global citizens and workers in diverse ethnic and organizational cultures.

9.2 21st Century Life and Career Skills: Personal Financial Literacy: All students will develop skills and strategies that promote personal and financial responsibility related to financial planning, savings, investment, and charitable giving in the global economy.

9.3 21st Century Life and Career Skills: Career Awareness, Exploration, and Preparation: All students will apply knowledge about and engage in the process of career awareness, exploration, and preparation in order to navigate the globally competitive work environment of the information age.

Unit 1: Linear Expressions, Equations, and Inequalities

Content Area: **Mathematics**
Course(s):
Time Period: **1st Marking Period**
Length: **40 Days**
Status: **Published**

Summary of the Unit

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Enduring Understandings

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Essential Questions

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- Given the graph of a linear function, how can you write an equation of the line?
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- How can you use substitution/elimination to solve a system of linear equations?
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Summative Assessment and/ or Summative Criteria to demonstrate mastery of the Unit.

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introduced topic/content area.
- Teacher Observation: To be done on each introduced topic/content area.
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Formative Assessment: To be administered at the close of each topic.

- Quizzes, Projects, Tests and/or Quarterlies: Assessments on the mathematical content of the Everyday Algebra Curriculum
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Resources

References:

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- New Jersey Student Learning Standards (2023)

Unit Plan

Topic/ Selection	Suggested Timeline per topic	General Objectives	Instructional Activities	Suggested Benchmarks/ Assessments
Solving Simple Equations	2 days	Students will solve simple linear equations using addition, subtraction, multiplication, and division and use these equations to solve real-life problems.	Review all terminology related to solving equations. Have students identify inverse operations. Model example problems. Climate Change Example: Students may create equations and/or inequalities to represent the economic impact of climate change.	Observation Use of technology to support instruction Use of manipulatives to support instruction
Solving	2 days	Students will solve	Review all	Observation

Multi-Step Equations		multi-step linear equations using inverse operations. Students will use multi-step linear equations to solve real-life problems. Students will solve real-world problems.	terminology related to solving equations. Have students identify inverse operations. Model example problems. Climate Change Example: Students may create equations and/or inequalities to represent the economic impact of climate change.	Use of technology to support instruction Use of manipulatives to support instruction Performance Assessment	MA.A MA.A
Solving Equations with Variables on Both Sides	2 days	Students will solve linear equations that have variables on both sides and use linear equations to solve real-life problems. Students will identify special solutions of linear equations.	Review all terminology related to solving equations with variables on both sides of the equation. Model example problems. Climate Change Example: Students may create equations and/or inequalities to represent the economic impact of climate change. Climate Change Example: Students may use units to guide the solution of multi-step problems about how variations in the flow of energy into and out of the Earth's systems result in climate change. Note: Changes in climate are limited to changes in surface temperatures, precipitation patterns, glacial ice volumes, sea levels, and biosphere distribution.	Observation Use of technology to support instruction Use of manipulatives to support instruction	MA.A MA.A

Rewriting Equations and Formulas	2 days	Students will rewrite literal equations.	Review all terminology related to rewriting equations. Model example problems. Climate Change Example: Students may rearrange formulas related to the economic impact of climate change to highlight a quantity of interest, using the same reasoning as in solving equations.	Observation Use of technology to support instruction Use of manipulatives to support instruction Performance Assessment	MA.A
Solving Simple Inequalities	2 days	Students will write, solve, and graph inequalities that involve addition, subtraction, multiplication, and division.	Review all terminology related to solving simple inequalities. Remind students of rules for solving equations. Model example problems. Climate Change Example: Students may create equations and/or inequalities to represent the economic impact of climate change.	Observation Use of technology to support instruction Use of manipulatives to support instruction	MA.A MA.A
Solving Multi-Step Inequalities	2 days	Students will solve multi-step inequalities that involve addition, subtraction, multiplication, and division.	Review all terminology related to solving multi-step inequalities. Remind students of rules for solving multi-step equations. Model example problems. Climate Change	Observation Use of technology to support instruction Performance Assessment	MA.A MA.A

			Example: Students may create equations and/or inequalities to represent the economic impact of climate change.		
Writing and Graphing Linear Equations	5 days	Students will find the slope of a line given two coordinates using the slope equation and from a graph. Students will identify the y-intercept from an equation in slope-intercept form and from a graph. Students will write equations in slope-intercept form given a graph. Students will graph a line given an equation. Students will solve real-world problems.	Review all terminology related to writing and graphing linear equations. Model example problems. Provide or have student discover necessary formulas (slope formula, slope-intercept form).	Written Assessment	MA.A F-IF.B MA.F- MA.F-
Writing and Graphing Linear Inequalities	3 days	Students will graph linear inequalities in two variables. Students will check solutions to linear inequalities. Students will solve real-world problems.	Review all terminology related to writing and graphing linear equations. Refer to/ review rewriting equations in slope-intercept form and graphing linear equations. Model example problems. Climate Change Example: Students may represent constraints describing the economic impact of climate change by equations, inequalities, and/or by systems of	Written Assessment	MA.A MA.A

			inequalities, and interpret solutions as viable or nonviable options.		
Solving Systems of Linear Equations by Graphing	5 days	Students will solve systems of linear equations by graphing. Students will check solutions of systems of linear equations. Students will use systems of linear equations to solve real-life problems.	Review all terminology related to solving systems of linear equations by graphing. Model example problems. Have students discover ways to determine if a system of equations has one solution, no solution, or infinitely many solutions through graphing using teacher chosen/created materials.	Use of technology to support instruction Use of manipulatives to support instruction Performance Assessment	MA. F MA.A
Solving Systems of Linear Equations by Substitution	5 days	Students will solve systems of linear equations by substitution. Students will check solutions of systems of linear equations. Students will use systems of linear equations to solve real-life problems.	Review all terminology related to solving systems of linear equations by substitution. Model example problems. Have students discover ways to determine if a system of equations has one solution, no solution, or infinitely many solutions through substitution using teacher chosen/created materials. Climate Change Example: Students may represent constraints describing the economic impact of climate change by equations,	Use of technology to support instruction Performance Assessment	MA.A MA.A

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Solving Linear Systems in 3 Variables	5 days	Students will visualize solutions of systems of linear equations in three variables. Solve systems of linear equations in three variables algebraically. Students will solve real-life problems.	Students will use previous knowledge to match solutions to given systems. Apply substitution and elimination methods where appropriate to solve 3x3 systems. Express given word	Observation Use of technology to support instruction Performance Assessment	MA.N MA.N MA.N

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MA.A-REI.C.6+
MA.A-REI.D.12
MA F-IF.B.4
MA.F-IF.C.7a
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- Homework: To be given on each introduced topic/content area
- Class Discussion: Students will be expected to be prepared for class, participate in class activities and actively engage in class discussion.
- Exit Tickets, Writing Prompts, Communicating Your Answers Questions, 3-2-1 Reflection Sheets, Point of Most Significance Questions, Phone Message Activities, etc.: To be given daily on each

introduced topic/content area.
- Teacher Observation: To be done on each introduced topic/content area.
- Students will demonstrate mastery through various assessment criteria within the unit per teacher discretion.

Formative Assessment: To be administered at the close of each topic.

- Quizzes, Projects, Tests and/or Quarterlies: Assessments on the mathematical content of the Everyday Algebra Curriculum
- Students will demonstrate mastery through various assessment criteria within the unit per teacher discretion.

Resources

References:

- Big Ideas Math High School Algebra 1 (2015)
- Big Ideas Math High School Algebra 2 (2015)
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Unit Plan

Topic/ Selection	Suggested Timeline per topic	General Objectives	Instructional Activities	Suggested Benchmarks/ Assessments
Solving Simple Equations	2 days	Students will solve simple linear equations using addition, subtraction, multiplication, and division and use these equations to solve real-life problems.	Review all terminology related to solving equations. Have students identify inverse operations. Model example problems. Climate Change Example: Students may create equations and/or inequalities to represent the economic impact of climate change.	Observation Use of technology to support instruction Use of manipulatives to support instruction
Solving	2 days	Students will solve	Review all	Observation

Multi-Step Equations		multi-step linear equations using inverse operations. Students will use multi-step linear equations to solve real-life problems. Students will solve real-world problems.	terminology related to solving equations. Have students identify inverse operations. Model example problems. Climate Change Example: Students may create equations and/or inequalities to represent the economic impact of climate change.	Use of technology to support instruction Use of manipulatives to support instruction Performance Assessment	MA.A MA.A
Solving Equations with Variables on Both Sides	2 days	Students will solve linear equations that have variables on both sides and use linear equations to solve real-life problems. Students will identify special solutions of linear equations.	Review all terminology related to solving equations with variables on both sides of the equation. Model example problems. Climate Change Example: Students may create equations and/or inequalities to represent the economic impact of climate change. Climate Change Example: Students may use units to guide the solution of multi-step problems about how variations in the flow of energy into and out of the Earth's systems result in climate change. Note: Changes in climate are limited to changes in surface temperatures, precipitation patterns, glacial ice volumes, sea levels, and biosphere distribution.	Observation Use of technology to support instruction Use of manipulatives to support instruction	MA.A MA.A

Rewriting Equations and Formulas	2 days	Students will rewrite literal equations.	Review all terminology related to rewriting equations. Model example problems. Climate Change Example: Students may rearrange formulas related to the economic impact of climate change to highlight a quantity of interest, using the same reasoning as in solving equations.	Observation Use of technology to support instruction Use of manipulatives to support instruction Performance Assessment	MA.A
Solving Simple Inequalities	2 days	Students will write, solve, and graph inequalities that involve addition, subtraction, multiplication, and division.	Review all terminology related to solving simple inequalities. Remind students of rules for solving equations. Model example problems. Climate Change Example: Students may create equations and/or inequalities to represent the economic impact of climate change.	Observation Use of technology to support instruction Use of manipulatives to support instruction	MA.A MA.A
Solving Multi-Step Inequalities	2 days	Students will solve multi-step inequalities that involve addition, subtraction, multiplication, and division.	Review all terminology related to solving multi-step inequalities. Remind students of rules for solving multi-step equations. Model example problems. Climate Change	Observation Use of technology to support instruction Performance Assessment	MA.A MA.A

			Example: Students may create equations and/or inequalities to represent the economic impact of climate change.		
Writing and Graphing Linear Equations	5 days	Students will find the slope of a line given two coordinates using the slope equation and from a graph. Students will identify the y-intercept from an equation in slope-intercept form and from a graph. Students will write equations in slope-intercept form given a graph. Students will graph a line given an equation. Students will solve real-world problems.	Review all terminology related to writing and graphing linear equations. Model example problems. Provide or have student discover necessary formulas (slope formula, slope-intercept form).	Written Assessment	MA.A F-IF.B MA.F MA.F
Writing and Graphing Linear Inequalities	3 days	Students will graph linear inequalities in two variables. Students will check solutions to linear inequalities. Students will solve real-world problems.	Review all terminology related to writing and graphing linear equations. Refer to/ review rewriting equations in slope-intercept form and graphing linear equations. Model example problems. Climate Change Example: Students may represent constraints describing the economic impact of climate change by equations, inequalities, and/or by systems of	Written Assessment	MA.A MA.A

			inequalities, and interpret solutions as viable or nonviable options.		
Solving Systems of Linear Equations by Graphing	5 days	Students will solve systems of linear equations by graphing. Students will check solutions of systems of linear equations. Students will use systems of linear equations to solve real-life problems.	Review all terminology related to solving systems of linear equations by graphing. Model example problems. Have students discover ways to determine if a system of equations has one solution, no solution, or infinitely many solutions through graphing using teacher chosen/created materials.	Use of technology to support instruction Use of manipulatives to support instruction Performance Assessment	MA. F MA.A
Solving Systems of Linear Equations by Substitution	5 days	Students will solve systems of linear equations by substitution. Students will check solutions of systems of linear equations. Students will use systems of linear equations to solve real-life problems.	Review all terminology related to solving systems of linear equations by substitution. Model example problems. Have students discover ways to determine if a system of equations has one solution, no solution, or infinitely many solutions through substitution using teacher chosen/created materials. Climate Change Example: Students may represent constraints describing the economic impact of climate change by equations,	Use of technology to support instruction Performance Assessment	MA.A MA.A

			inequalities, and/or by systems of inequalities, and interpret solutions as viable or nonviable options.		
Solving Systems of Linear Equations by Elimination	5 days	Students will solve systems of linear equations by elimination. Students will check solutions of systems of linear equations. Students will use systems of linear equations to solve real-life problems.	Review all terminology related to solving systems of linear equations by elimination. Model example problems. Have students discover ways to determine if a system of equations has one solution, no solution, or infinitely many solutions through elimination using teacher chosen/created materials. Climate Change Example: Students may represent constraints describing the economic impact of climate change by equations, inequalities, and/or by systems of inequalities, and interpret solutions as viable or nonviable options.	Observation Use of manipulatives to support instruction Written Assessment	MA.A MA.A MA.A
Solving Linear Systems in 3 Variables	5 days	Students will visualize solutions of systems of linear equations in three variables. Solve systems of linear equations in three variables algebraically. Students will solve real-life problems.	Students will use previous knowledge to match solutions to given systems. Apply substitution and elimination methods where appropriate to solve 3x3 systems. Express given word	Observation Use of technology to support instruction Performance Assessment	MA.N MA.N MA.N

			problems as systems of equations and solve.		

Standards

NJ Student Learning Standards (NJSLS)
MA.A-CED.A.1
MA.A-CED.A.2
MA.A-CED. A.3
MA.A-CED.A.4
MA.A-REI.A.1
MA.A-REI.B.3
MA.A-REI.C.5+
MA.A-REI.C.6+
MA.A-REI.D.12
MA F-IF.B.4
MA.F-IF.C.7a
MA.F-LE.B.5
MA.N-Q.A.1
MA.N-CN.A.1
MA.N-CN.A.2
MA.N-CN.C.7

MATH.9-12.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.
MATH.9-12.N.CN.A.1	Know there is a complex number i such that $i^2 = –1$, and every complex number has the form $a + bi$ with a and b real.
MATH.9-12.N.CN.A.2	Use the relation $i^2 = –1$ and the commutative, associative, and distributive properties to add, subtract, and multiply complex numbers.
MATH.9-12.A.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.
MATH.9-12.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.
MATH.9-12.A.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.
MATH.9-12.A.CED.A.4	Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations.
MATH.9-12.N.CN.C.7	Solve quadratic equations with real coefficients that have complex solutions.
MATH.9-12.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.
MATH.9-12.F.IF.B.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.
MATH.9-12.A.REI.B.3	Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.
MATH.9-12.A.REI.C.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.
MATH.9-12.F.IF.C.7.a	Graph linear and quadratic functions and show intercepts, maxima, and minima.
MATH.9-12.A.REI.C.6	Solve systems of linear equations algebraically (include using the elimination method) and graphically, focusing on pairs of linear equations in two variables.
MATH.9-12.A.REI.D.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.
MATH.9-12.F.LE.B.5	Interpret the parameters in a linear or exponential function in terms of a context.

Suggested Modifications for Special Education, ELL and Gifted Students

- Consistent with individual plans, when appropriate.
- Below-level learners can be provided with graphic organizers, vocabulary cards, study guides, printed notes, and leveled readers. Projects can be modified or leveled as needed.
- Restructure lesson using UDL principals (http://www.cast.org/our-work/about-udl.html#.VXmoXcfD_UA); Structure lessons around questions that are authentic, relate to students' interests, social/family background and knowledge of their community.
- Provide students with multiple choices for how they can represent their understandings (e.g. multisensory techniques-auditory/visual aids; pictures, illustrations, graphs, charts, data tables, multimedia, modeling).
- Provide opportunities for students to connect with people of similar backgrounds (e.g. conversations via digital tool such as SKYPE, experts from the community helping with a project, journal articles, and biographies).
- Provide multiple grouping opportunities for students to share their ideas and to encourage work among various backgrounds and cultures (e.g. multiple representation and multimodal experiences).
- Engage students with a variety of Science and Engineering practices to provide students with multiple entry points and multiple ways to demonstrate their understandings.
- Use project-based science learning to connect science with observable phenomena; Structure the learning around explaining or solving a social or community-based issue.
- Provide ELL students with multiple literacy strategies including websites with various language options.
- Collaborate with after-school programs or clubs to extend learning opportunities.

Suggested Technological Innovations/Use

Bigideasmath.com
Graphing Calculator Investigations

Cross Curricular/Career Readiness, Life Literacies and Key Skills Practice

9.1 21st Century Life and Career Skills: All students will demonstrate the creative, critical thinking, collaboration, and problem-solving skills needed to function successfully as both global citizens and workers in diverse ethnic and organizational cultures.

9.2 21st Century Life and Career Skills: Personal Financial Literacy: All students will develop skills and strategies that promote personal and financial responsibility related to financial planning, savings, investment, and charitable giving in the global economy.

9.3 21st Century Life and Career Skills: Career Awareness, Exploration, and Preparation: All students will apply knowledge about and engage in the process of career awareness, exploration, and preparation in order to navigate the globally competitive work environment of the information age.

Unit 1: Linear Expressions, Equations, and Inequalities

Content Area: **Mathematics**
Course(s):
Time Period: **1st Marking Period**
Length: **40 Days**
Status: **Published**

Summary of the Unit

In this unit students will solve and graph linear equations and inequalities. Students will use literal equations to solve real-world examples. Students will differentiate between the three common techniques for solving systems of equations which include graphing, substitution, and elimination. Students will then utilize these techniques to solve systems of equations in two and three variables that result in either one solution, no solution, or infinitely many solutions.

Enduring Understandings

- Creating, solving, and analyzing expressions and equations involving arithmetic operations is an essential skill necessary in order to apply mathematics to the real-world.
- The study of linear equations and inequalities allows for identifying and interpreting the relationship between two dependent variables.
- Relationships between two or more functions exists throughout the real-world.

Essential Questions

- How can you use simple and multi-step equations/inequalities to solve real-life problems?
- Given the graph of a linear function, how can you write an equation of the line?
- Can you use linear equations/inequalities to solve real-life problems?
- How can you use substitution/elimination to solve a system of linear equations?
- How can you discover the number of solutions to a linear system?

Summative Assessment and/or Summative Criteria

Summative Assessment and/ or Summative Criteria to demonstrate mastery of the Unit.

- Homework: To be given on each introduced topic/content area
- Class Discussion: Students will be expected to be prepared for class, participate in class activities and actively engage in class discussion.
- Exit Tickets, Writing Prompts, Communicating Your Answers Questions, 3-2-1 Reflection Sheets, Point of Most Significance Questions, Phone Message Activities, etc.: To be given daily on each

introduced topic/content area.
- Teacher Observation: To be done on each introduced topic/content area.
- Students will demonstrate mastery through various assessment criteria within the unit per teacher discretion.

Formative Assessment: To be administered at the close of each topic.

- Quizzes, Projects, Tests and/or Quarterlies: Assessments on the mathematical content of the Everyday Algebra Curriculum
- Students will demonstrate mastery through various assessment criteria within the unit per teacher discretion.

Resources

References:

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- New Jersey Student Learning Standards (2023)

Unit Plan

Topic/ Selection	Suggested Timeline per topic	General Objectives	Instructional Activities	Suggested Benchmarks/ Assessments
Solving Simple Equations	2 days	Students will solve simple linear equations using addition, subtraction, multiplication, and division and use these equations to solve real-life problems.	Review all terminology related to solving equations. Have students identify inverse operations. Model example problems. Climate Change Example: Students may create equations and/or inequalities to represent the economic impact of climate change.	Observation Use of technology to support instruction Use of manipulatives to support instruction
Solving	2 days	Students will solve	Review all	Observation

Multi-Step Equations		multi-step linear equations using inverse operations. Students will use multi-step linear equations to solve real-life problems. Students will solve real-world problems.	terminology related to solving equations. Have students identify inverse operations. Model example problems. Climate Change Example: Students may create equations and/or inequalities to represent the economic impact of climate change.	Use of technology to support instruction Use of manipulatives to support instruction Performance Assessment	MA.A MA.A
Solving Equations with Variables on Both Sides	2 days	Students will solve linear equations that have variables on both sides and use linear equations to solve real-life problems. Students will identify special solutions of linear equations.	Review all terminology related to solving equations with variables on both sides of the equation. Model example problems. Climate Change Example: Students may create equations and/or inequalities to represent the economic impact of climate change. Climate Change Example: Students may use units to guide the solution of multi-step problems about how variations in the flow of energy into and out of the Earth's systems result in climate change. Note: Changes in climate are limited to changes in surface temperatures, precipitation patterns, glacial ice volumes, sea levels, and biosphere distribution.	Observation Use of technology to support instruction Use of manipulatives to support instruction	MA.A MA.A

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Solving Multi-Step Inequalities	2 days	Students will solve multi-step inequalities that involve addition, subtraction, multiplication, and division.	Review all terminology related to solving multi-step inequalities. Remind students of rules for solving multi-step equations. Model example problems. Climate Change	Observation Use of technology to support instruction Performance Assessment	MA.A MA.A

			Example: Students may create equations and/or inequalities to represent the economic impact of climate change.		
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MA.A-REI.C.5+
MA.A-REI.C.6+
MA.A-REI.D.12
MA F-IF.B.4
MA.F-IF.C.7a
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