






Marking Period	Unit Title	Recommended Instructional Days
2	Solving Equations and Systems of Equations	22 - 27
Domain		
<p>Strand:</p> <p> 8.EE.C.7 Solve linear equations in one variable.</p> <p>a. Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form $x = a$, $a = a$, or $a = b$ results (where a and b are different numbers).</p> <p>b. Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.</p> <p> 8.EE.C.8 Analyze and solve pairs of simultaneous linear equations.</p> <p>a. Understand that solutions to a system of two linear equations in two variables correspond to points of intersection of their graphs, because points of intersection satisfy both equations simultaneously.</p> <p>b. Solve systems of two linear equations in two variables algebraically, and estimate solutions by graphing the equations. Solve simple cases by inspection. For example, $3x + 2y = 5$ and $3x + 2y = 6$ have no solution because $3x + 2y$ cannot simultaneously be 5 and 6.</p> <p>c. Solve real-world and mathematical problems leading to two linear equations in two variables. For example, given coordinates for two pairs of points, determine whether the line through the first pair of points intersects the line through the second pair.</p> <p>Key:</p> <p> Major Cluster  Supporting Cluster  Additional Cluster</p>		
<p>Progress Indicator: ◊ Tests ◊ Homework / Classwork ◊ Projects ◊ Formative assessments ◊ Summative assessments</p>		
Mathematical Practices:		
<p>1. Make sense of problems and persevere in solving them.</p> <p>2. Reason abstractly and quantitatively.</p>		

3. Construct viable arguments and critique the reason 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.

Recommended Activities, Investigations, Interdisciplinary Connections, and/or Student Experiences to Explore NJSL-CLKS within Unit

Essential Questions:

Module 7:

What determines if terms are considered “like terms”?

How can you represent and solve equations with the variable on both sides?

How can you solve equations with rational number coefficients and constants?

How can you expand an expression using the distributive property?

How do you use the Distributive Property to solve equations?

Will a one-variable equation always have only one solution?

How can you give examples of equations with a given number of solutions?

How can you distinguish an equation with “no solution” from an equation with “infinitely many solutions”?

Module 8:

What is meant by the “solution” to a system of equations?

How can you solve a system of equations by graphing?

How do you use substitution to solve a system of linear equations?

When is it easier or more beneficial to solve a system of equations by substitution?

How do you solve a system of linear equations by adding or subtracting?

How do you solve a system of linear equations by multiplying?

How are slopes and y-intercepts related to the number of solutions of a system of linear equations?

How do you solve a system with no solutions or infinitely many solutions?

Essential Understandings:

Module 7:

Expressions can be expanded by using the distributive property and simplified by combining like terms.

Equations can be solved to find a missing variable.

Linear equations may have one, none or infinitely many solutions.

Module 8:

Systems of equations can be solved using various methods.

Systems of equations can be used to solve both real-world and mathematical problems.

Systems of equations can have one, none or infinitely many solutions.

Vocabulary:

- system of equations
- solution of a system of equations
- substitution method
- elimination method

**Encourage students to practice using the unit vocabulary as they talk and write about mathematics. Understanding vocabulary will aid their understanding of the concepts.*

Suggested Activity Descriptions:

- To review one- and two-step equations, consider partnering students and showing an equation on the board. Have one student instruct the other on how to solve as the student listening writes each step and solution. Then, show a new equation and have students switch roles. This gives students a chance to teach and reinforce what they remember about one and two-step equations.
- After students have had time to practice multi-step equations, have “Board Races.” Two students will come up to the board and race to solve an equation shown on the board. The person who solves it correctly first stays up at the board for the next equation with a new competitor. Have the students who aren’t at the board working the equations on notebook paper to help check the solutions.
- Search the Illuminations website for “Geology Rocks Equations” for a great visual as well as a great lesson where students use tactile representations to solve for missing values.
- Give students a chance to write their own equations with special cases to demonstrate their understanding. It may be helpful to pose a question with “blanks” to fill in. For example, ask students to write an equation with no solution by filling in each blank with a number 0-9:
 $9x - 4x + 2 + x = \underline{\quad}x + \underline{\quad}$
- Search the Illuminations website and search “Talk or Text” for an example where students compare costs of two cell phone plans, write equations and graph their equations to find the solution to the system. This example helps by connecting the material to a real-world situation.
- Put an equation on the board and have students write a second equation with either no solution or infinitely many solutions.
- GoMATH Activity 7.4 Mathy Plants (TB page 220A - 220B)
- GoMATH Unit 3 Review Project: WHICH CAR COSTS LESS?

Suggested Sample Task:

Activity Description: Climate Change

Interdisciplinary Connections: Science

Between 1970 and 2010, the average global temperature has increased by $+1.1^\circ$ Fahrenheit ($+0.6^\circ$ Celsius), or a rate of $+0.028^\circ\text{F}/\text{year}$. In 1970, the average global temperature was 57.2°F ($+14.0^\circ\text{C}$). Write a linear equation in the point-slope form that models the Fahrenheit temperature change from 1970 to 2012. What do you predict the temperature will be in 2020?

KEY:

Point-slope: Coordinates of the point are (1970, $+57.2^\circ\text{F}$) the slope $m = +0.028$. So $F - 57.2 = +0.028(Y - 1970)$. In 2020, the predicted temperature will be $F - 57.2 = +0.028(2020 - 1970)$, so $F = +58.6^\circ$ Fahrenheit.

Source: NASA SpaceMath

Interdisciplinary Connections:

Science:

1. The formula $F = 1.8C + 32$ gives the temperature in degrees Fahrenheit for a given temperature in degrees Celsius. There is one temperature for which the number of degrees Fahrenheit is equal to the number of degrees Celsius. Write an equation you can solve to find that temperature and then use it to find the temperature.
2. Textbook pg. 214 #17

Language Arts:

1. Vocabulary Preview Activity on GoMATH pg. 192
2. Reading Startup Activities on GoMATH pages 195 and 225.

Spot Light On: Ron Buckmire

Social and Emotional Learning: Competencies	Social and Emotional Learning: Sub-Competencies
SEL Competencies: <ul style="list-style-type: none"> • Self-Awareness • Social Awareness • Self-Management • Relationship Skills • Responsible Decision-Making 	<ul style="list-style-type: none"> • Recognizing the importance of self-confidence in handling daily tasks and challenges. • Demonstrate an awareness of the expectations for social interactions in a variety of ways. • Demonstrate an understanding of the need for mutual respect when viewpoints differ. • Identify and apply ways to persevere through alternative methods to achieve goals.

Grade 8 Mathematics
Unit 3: Solving Equations and Systems of Equations

September
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		<ul style="list-style-type: none"> • Utilize positive communication and social skills to interact effectively with others. • Develop, implement, and model effective problem solving and critical thinking skills. 	
Assessments (Formative) <i>To show evidence of meeting the standard/s, students will successfully engage within:</i>		Assessments (Summative) <i>To show evidence of meeting the standard/s, students will successfully complete:</i>	
Formative Assessments: <ul style="list-style-type: none"> • Teacher Observations • Exit Tickets • Quizzes • Self Assessments • Math Journals • Homework/Classwork • Teacher created assessments 		Benchmarks & Summative Assessments: <ul style="list-style-type: none"> • Chapter/Unit Assessments • Standardized Tests • District Assessments • Project-based Assessments 	
Differentiated Student Access to Content: Teaching and Learning <i>Resources/Materials</i>			
Core Resources	Alternate Core Resources <i>IEP/504/At-Risk/ESL</i>	ELL Core Resources	Gifted & Talented Core Resources
Go Math Workbook, IXL, Personal Math Trainer, Math on the Spot Videos, My HRW, Khan Academy, Illustrative Mathematics, Learn360, TeacherTube, BrainPOP, Freckle, LearnZillion, MobyMax, 60 minutes of weekly ST Math, Edulastic, Achieve the Core, Desmos	Reteaching worksheets, Skill building workbook, Math manipulatives, Leveled practice worksheets	Dictionary for native language, Video tutorial in native language, Success for English Learners worksheets, GoMATH Leveled Strategies for English Learners, GoMATH Linguistic Support	ST Math Challenge Objectives, G&T tasks, Enrichment worksheets, Art of Problem Solving, Leveled assessments, GoMATH Teaching for Depth, GoMATH Extend-the-Math Activity, Math Olympiad
Supplemental Resources			
Technology: <ul style="list-style-type: none"> • Chromebooks • Scientific/Graphing Calculators (upper grades only) • Online math manipulatives Other: <ul style="list-style-type: none"> • Google Classroom, Google Meets, Schoology, Interactive Workbooks • Illustrative Mathematics • insidemathematics.org • National Library of Virtual Manipulatives 			

Differentiated Student Access to Content: Recommended <i>Strategies & Techniques</i>			
Core Resources	Alternate Core Resources <i>IEP/504/At-Risk/ESL</i>	ELL Core Resources	Gifted & Talented Core
Deliver instruction utilizing varied learning styles including audio, visual, and tactile/kinesthetic, provide individual instruction as needed, modify assessments and/or rubrics.	Utilize a multi-sensory (VAKT) approach during instruction, provide alternate presentations of skills by varying the method (repetition, simple explanations, additional examples, modeling, etc.), modify test content and/or format, allow students to retake test for additional credit, provide additional times and preferential seating as needed, review, restate and repeat directions, provide study guides, and/or break assignments into segments of shorter tasks.	Extend time requirements, preferred seating, positive reinforcement, check often for understanding/review, oral/visual directions/prompts when necessary, supplemental materials including use of an online bilingual dictionary, and modified assessment and/or rubric.	Create an enhanced set of introductory activities, integrate active teaching/learning opportunities, incorporate authentic components, propose interest-based extension activities, and connect student to related content.

NJSLS CAREER READINESS, LIFE LITERACIES & KEY SKILLS	Disciplinary Concept(s): Critical Thinking and Problem Solving		
	Core Ideas:	The ability to solve problems effectively begins with gathering data, seeking resources, and applying critical thinking skills.	
	Performance Expectation/s:	9.4.5.CT.4: Apply critical thinking and problem-solving strategies to different types of problems such as personal, academic, community and global.	
	Career Readiness, Life Literacies, & Key Skills Practices		
	Act as a responsible and contributing community member and employee. Attend to financial well-being.		

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	<p>Consider the environmental, social and economic impacts of decisions. Demonstrate creativity and innovation. Utilize critical thinking to make sense of problems and persevere in solving them. Model integrity, ethical leadership and effective management. Plan education and career paths aligned to personal goals. Use technology to enhance productivity, increase collaboration and communicate effectively. Work productively in teams while using cultural/global competence.</p>
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New Jersey Legislative Statutes and Administrative Code (place an "X" before each law/statute if/when present within the curriculum map)									
X	Amistad Law: <i>N.J.S.A. 18A 52:16A-88</i>			X	LGBT and Disabilities Law: <i>N.J.S.A. 18A:35-4.35</i>	X	Diversity & Inclusion: <i>N.J.S.A. 18A:35-4.36a</i>	X	Standards in Action: <i>Climate Change</i>