Orange Public Schools

Office of Curriculum & Instruction
2019-2020 Mathematics Curriculum Guide

Algebra I

Unit 2: Systems of Equation, Inequality and Systems of inequality

November 14, 2019 – January 30, 2020

Revised 12/19/19

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Contents

A Story of Units

A STORY OF UNITS (Yearly Pacing Guide)				
Marking Period	Unit 1 (9/9/19 – 11/13/19)	Unit 2 (11/14/19- 1/30/20)	Unit 3 (1/31/20-4/30/20)	Unit 4 **(5/4-20-6/22/20)**
Unit Topic	Linear Functions and Equations	System of Linear Equations/Inequalities	Quadratic Functions & Polynomials	Exponential Functions
Description	Identify types of function; create linear functions and equations to model situation given and solve the problems	Creating system of equations/Inequalities to model real-life situations and solve the problems Identify types of functions with tables and graphs	Identify quadratic functions; find key features for the graphs. Solve quadratic equations by using tables, graphing, and algebraically. Identify types of polynomial and work on the operation of polynomials	Create exponential functions and equations to model real life situation and solve the problems.

Algebra 1 Unit 2 – Tier 1

Unit Overview

Unit 2: Linear Functions, Systems, and Inequalities

Essential Questions

- How can we use different tools and representations to solve problems?
- How can the same linear relationship be represented in multiple ways?
- When do we use systems of equations and inequalities to model real world problems?
- What are the different types of solutions that a system of equations can have?
- What is the best way to represent solutions to systems of inequalities?

Enduring Understandings

- Units can be used to describe and explain steps and solutions of problems that model a real world scenario.
- A linear function and a system of linear functions can be represented in multiple ways and can be used to model and solve problems in a real world context.
- A linear inequality and a system of linear equalities can be used to model and solve problems in a real world context.
- Solutions to inequalities and systems of inequalities are best represented graphically.

Interdisciplinary Connection:

Presentation of Knowledge and Ideas:

ELA.LITERACY.SL.9-10.4: Present information, findings, and supporting evidence clearly, concisely, and logically such that listeners can follow the line o reasoning and the organization, development, substance, and style are appropriate to purpose, audience, and task.

HSN.Q.A.1: Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays. (HS>PS1-7)

Technology

8.1: Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.

NJSLS

1) A.REI.5: Prove that, given a system of two equations in two variables, replacing one equation by the sum of that equation and a multiple of the other produces a system with the same solutions.
2) A.REI.6: Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.
3) A.REI.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).
4) A.REI.11: Explain why the x-coordinates of the points where the graphs of the equations $y = f(x)$ and $y = g(x)$ intersect are the solutions of the equation $f(x) = g(x)$; find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where $f(x)$ and/or $g(x)$ are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.
5) A.REI.12: Graph the solutions to a linear inequality in two variables as a half-plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes.
6) A.CED.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*.

7) A.CED.2: Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.
8) A.CED.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*.
9) A.CED.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*.
10) N.Q.1: Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.
11) N.Q.2: Define appropriate quantities for the purpose of descriptive modeling.
12) F.IF.2: Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.
13) F.IF.4: For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. *Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity*.
14) F.IF.5: Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. *For example, if the function h(n) gives the number of person-hours it takes to assemble n engines in a factory, then the positive integers would be an appropriate domain for the function.*[*]
15) F.IF.7a: Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.* Graph linear and quadratic functions and show intercepts, maxima, and minima.
16) F.BF.1a: Write a function that describes a relationship between two quantities. Determine an explicit expression, a recursive process, or steps for calculation from a context.
17) F.LE.5: Interpret the parameters in a linear or exponential function in terms of a context.
18) A.SSE.1: Interpret expressions that represent a quantity in terms of its context.
19) S.ID.6a: Fit a function to the data; use functions fitted to data to solve problems in the context of the data. Use given functions or choose a function suggested by the context. Emphasize linear, quadratic, and exponential models.
20) S.ID.6b: Fit a linear function for a scatter plot that suggests a linear association.
21) S.ID.7: Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.
22) S.ID.8: Compute (using technology) and interpret the correlation coefficient of a linear fit.

M : Major Content S: Supporting Content A : Additional Content

Student Learning Material

Carnegie Learning https://www.carnegielearning.com/login/#/
Course: HSMS Algebra I (@2018)
Supplemental resource: Mathia

There are five modules in the text. Each module has 2 to four topics. Unit 2 consist of module 2 Topic 2 and Topic 3

In module 2 Topic 2 students connect what they know about equations to solve linear inequalities.When constraints are put on a scenario, They learn how a negative coefficient on the variable affects the inequality sign and solve more complex inequalities. Finally, students solve compound inequalities and represent their solutions on number lines.

In module 2 topic 3 Students build on their current tools for solving systems of equations. They first use equations in standard form to solve systems of equations using linear combinations. Students analyze the structure of equations to select an efficient method to solve: inspection, graphing, substitution, or linear combinations. Students are introduced to two-variable inequalities. They recognize that just as the solutions to a one-variable inequality are a set of numbers, the solutions to a two-variable inequality are a set of ordered pairs. Students solve systems of linear inequalities graphically. They write systems of equations and inequalities for real-world situations and use function notation to solve linear programming problems

Each lesson starts with a task followed by guided practice and independent practice. See the link below:

https://www.dropbox.com/s/e2ts0uly7gam2nb/Algebra%201Unit%201%20Big%20Rocks.docx?dl=0

Algebra 1 Unit 2 – Tier 1

Modifications

Modifications	
Special Education/ 504:	**English Language Learners:**
-Adhere to all modifications and health concerns stated in each IEP. -Give students a MENU options, allowing students to pick assignments from different levels based on difficulty. -Accommodate Instructional Strategies: reading aloud text, graphic organizers, one-on-one instruction, class website (Google Classroom), handouts, definition list with visuals, extended time -Allow students to demonstrate understanding of a problem by drawing the picture of the answer and then explaining the reasoning orally and/or writing , such as Read-Draw-Write -Provide breaks between tasks, use positive reinforcement, use proximity -Assure students have experiences that are on the Concrete- Pictorial- Abstract spectrum by using manipulatives -Common Core Approach to Differentiate Instruction: Students with Disabilities (pg 17-18) -Strategies for Students with 504 Plans	- Use manipulatives to promote conceptual understanding and enhance vocabulary usage - Provide graphic representations, gestures, drawings, equations, realia, and pictures during all segments of instruction - During ALEKS lessons, click on “Español” to hear specific words in Spanish - Utilize graphic organizers which are concrete, pictorial ways of constructing knowledge and organizing information - Use sentence frames and questioning strategies so that students will explain their thinking/ process of how to solve word problems - Utilize program translations (if available) for L1/ L2 students - Reword questions in simpler language - Make use of the ELL Mathematical Language Routines (click here for additional information) -Scaffolding instruction for ELL Learners -Common Core Approach to Differentiate Instruction: Students with Disabilities (pg 16-17)
Gifted and Talented:	**Students at Risk for Failure:**
- Elevated contextual complexity - Inquiry based or open ended assignments and projects - More time to study concepts with greater depth - Promote the synthesis of concepts and making real world connections - Provide students with enrichment practice that are	- Assure students have experiences that are on the Concrete- Pictorial- Abstract spectrum - Modify Instructional Strategies, reading aloud text, graphic organizers, one-on-one instruction, class website (Google Classroom), inclusion of more visuals and manipulatives, Field Trips, Google Expeditions, Peer Support, one on one instruction

imbedded in the curriculum such as: ● Application / Conceptual Development ● Are you ready for more? - Common Core Approach to Differentiate Instruction: Students with Disabilities (pg. 20) - Provide opportunities for math competitions - Alternative instruction pathways available	- Assure constant parental/ guardian contact throughout the year with successes/ challenges - Provide academic contracts to students and guardians - Create an interactive notebook with samples, key vocabulary words, student goals/ objectives. - Always plan to address students at risk in your learning tasks, instructions, and directions. Try to anticipate where the needs will be and then address them prior to lessons. -Common Core Approach to Differentiate Instruction: Students with Disabilities (pg 19)

Algebra 1 Unit 2 – Tier 1

21st Century Life and Career Skills

21st Century Life and Career Skills:

Career Ready Practices describe the career-ready skills that all educators in all content areas should seek to develop in their students. They are practices that have been linked to increase college, career, and life success. Career Ready Practices should be taught and reinforced in all career exploration and preparation programs with increasingly higher levels of complexity and expectation as a student advances through a program of study.

https://www.state.nj.us/education/cccs/2014/career/9.pdf

- **CRP1**. Act as a responsible and contributing citizen and employee.
- **CRP2**. Apply appropriate academic and technical skills.
- **CRP3**. Attend to personal health and financial well-being.
- **CRP4**. Communicate clearly and effectively and with reason.
- **CRP5**. Consider the environmental, social and economic impacts of decisions.
- **CRP6**. Demonstrate creativity and innovation.
- **CRP7**. Employ valid and reliable research strategies.
- **CRP8**. Utilize critical thinking to make sense of problems and persevere in solving them.
- **CRP9**. Model integrity, ethical leadership and effective management.
- **CRP10**. Plan education and career paths aligned to personal goals.
- **CRP11**. Use technology to enhance productivity.
- **CRP12**. Work productively in teams while using cultural global competence.

Students are given an opportunity to communicate with peers effectively, clearly, and with the use of technical language. They are encouraged to reason through experiences that promote critical thinking and emphasize the importance of perseverance. Students are exposed to various mediums of technology, such as digital learning, calculators, and educational websites.

Technology Standards:

Technology Standards:

All students will be prepared to meet the challenge of a dynamic global society in which they participate, contribute, achieve, and flourish through universal access to people, information, and ideas.

https://www.state.nj.us/education/cccs/2014/tech/

8.1 Educational Technology:

All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.

A. **Technology Operations and Concepts:** Students demonstrate a sound understanding of technology concepts, systems and operations.
B. **Creativity and Innovation:** Students demonstrate creative thinking, construct knowledge and develop innovative products and process using technology.
C. **Communication and Collaboration:** Students use digital media and environments to communicate and work collaboratively, including at a distance, to support individual learning and contribute to the learning of others.
D. **Digital Citizenship:** Students understand human, cultural, and societal issues related to technology and practice legal and ethical behavior.
E. **Research and Information Fluency:** Students apply digital tools to gather, evaluate, and use of information.
F. **Critical thinking, problem solving, and decision making:** Students use critical thinking skills to plan and conduct research, manage projects, solve problems, and make informed decisions using appropriate digital tools and resources.

8.2 Technology Education, Engineering, Design, and Computational Thinking - Programming:

All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.

A. **The Nature of Technology: Creativity and Innovation-** Technology systems impact every aspect of the world in which we live.
B. **Technology and Society:** Knowledge and understanding of human, cultural, and societal values are fundamental when designing technological systems and products in the global society.
C. **Design:** The design process is a systematic approach to solving problems.
D. **Abilities in a Technological World:** The designed world in a product of a design process that provides the means to convert resources into products and systems.
E. **Computational Thinking: Programming-** Computational thinking builds and enhances problem solving, allowing students to move beyond using knowledge to creating knowledge.

Interdisciplinary Connections:

Interdisciplinary Connections:	
English Language Arts:	
NJSLS ELA.Literacy.RI-9-10.4	Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze the cumulative impact of specific word choices on meaning and tone (e.g., how the language of a court opinion differs from that of a newspaper).
NJSLS ELA-LITERACY.SL.9-10.4	Present information, findings, and supporting evidence clearly, concisely, and logically such that listeners can follow the line of reasoning and the organization, development, substance, and style are appropriate to purpose, audience, and task.
NJSLS .ELA-LITERACY.W.9-10.2.A	Introduce a topic; organize complex ideas, concepts, and information to make important connections and distinctions; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.

Pacing Guide

Overview		
Lesson	Topic	Suggesting Pacing
1	Standard form of a linear function	2 days
2	Least Squares Regression (Line of the best fit)	2 -3days
3	Solving Systems graphically and equal value method	2 days
4	Solving systems using linear combinations	3 days
5	Identify number of solution graphically and algebraically	2 days
6	Pumpkin Rich task	2 days
7	Graphing linear inequalities	3 days
8	Systems of linear inequalities	3 days

Summary:

1 reflection/diagnostic day
19-20 days spent on new content (8 lessons/topics)
2 task days
1 review day
1/2 day Performance task
1/2 day ECRS
1 day MP2 Benchmark
1 day test
1-2 day fall NWEA
3 flex days

30-31 days in Unit 2

Winter NWEA Map test (1-2 days): Test Window: 1/6/2020 – 1/17/2020

MP 2 Benchmark Assessment Window: 1/13/2020 – 1/24/2020

Please fill in the pacing guiding based on the pacing

Calendar

November 2019						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

December 2019						
Sun	**Mon**	**Tue**	**Wed**	**Thu**	**Fri**	**Sat**
1	2	3	**4**	5	**6**	**7**
8	**9**	**10**	**11**	**12**	**13**	**14**
15	**16**	**17**	**18**	**19**	**20** **Half day**	**21**
22	**23**	**24**	**25**	**26**	**27**	**28**
29	**30**	**31**				

Algebra 1 Unit 2 – Tier 1

January 2020						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

Algebra 1 Unit 2 – Tier 1

Assessment Framework

Assessment	NJSLS	Estimated Time	Date	Format	Graded
Diagnostic/Readiness Assessment *Unit 2 Diagnostic*	All	<½ Block	10/5/14 or beginning of unit	Individual	No
Assessment Checkup #1 *Suggested: CL Chapter 3 End of Chapter Test #'s 7, 9* *CL Chapter 3 Standardized Test Practice #'s 5, 10*	A.SSE.1, F.LE.5, F.BF.1, F.IF.7, F.IF.2, F.IF.4, F.IF.5, A.CED.1, A.CED.2, A.REI.10, N.Q.1, N.Q.2	½ Block	10/14/14 or before lesson 3	Individual	Yes
Assessment Checkup #2	A.CED.3, A.REI.6, A.REI.11, N.Q.1, N.Q.2	½ Block	10/28/14 or before Lesson 7	Individual	Yes
Assessment Checkup #3 *CL Chapter 7 End of Chapter Test #'s 1-3, 7*	A.CED.3, A.REI.12, N.Q.1, N.Q.2	½ Block	11/4/14 or before Lesson 9	Individual	Yes
Unit 2 Assessment	All	1 Block	11/13/14	Individual	Yes

Assessment	NJSLS	Estimated Time	Date	Format	Graded
Rich Task *Pumpkin Problem*	A.CED.2, A.CED.3, A.REI.6, N.Q.1, N.Q.2	½ Block	10/15/14 or as Lesson 3	Pair, or group	Optional
Reasoning Task *Reasoning with solutions to systems of linear inequalities task*	A.REI.5, A.REI.6, A.REI.11	½ Block	10/28/14 or before Lesson 7	Individual	Yes
Modeling Task *Fishing Adventures Task*	A.REI.12, A.CED.3	½ Block	11/11/14 or after Lesson 9	Individual	Yes
ECRs	A.REI.6, A.REI.11	20-25 minute per ECR	Last week of each month	individual	Yes

Lesson 1

Lesson 1: Standard form of a linear function

Objectives

- After investigating a problem on selling tickets, students will create and interpret a linear function written in standard form with at least ___ out of ___ parts answered correctly on an opened ended problem.

Focused Mathematical Practices

- MP 2: Reason abstractly and quantitatively
- MP 7: Look for and make use of structure

Vocabulary

- Standard form (may not be formally introduced until next day)

Common Misconceptions

- Be prepared to encounter confusion about function notation of a linear equation in standard form.

NJSLS	**Concepts** What students will know	**Skills** What students will be able to do	Material/ Resource	Suggested Pacing	Assessment Check Point
A.CED.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*. A.CED.2: Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales. F.BF.1a: Write a function that describes a relationship between two quantities. Determine an explicit expression, a recursive process, or steps for calculation from a context.	***Review*** • An equation can be created to solve problems involving a context • Variables can be used to represent unknown or changing quantities ***New*** • Linear equations can be written in several forms, including standard form, and can also represent relationships between quantities in a context.	***Review*** • Creating equations given a description of a problem situation • Solving problems given a description of a problem situation ***New*** • Creating linear equations in *standard form* given a description of a problem situation • Graphing linear equation in standard form	Guided practice Module 2 topic 2.2 Skills practice Task 1	2 days	CL ST pg. 185-186, #'s 1-5
F.IF.2: Use function notation, evaluate functions for inputs in	***Review*** • Functions can be written using a specific	***Review*** • Write and interpret functions in function			

their domains, and interpret statements that use function notation in terms of a context.	notation • Function notation can reveal meaningful information about the inputs and outputs when it is modeling a problem in a context ***New*** • Linear functions in standard form can also be written using function notation and be interpreted in the context of the problem they model	notation that model a problem in a context ***New*** • Write and interpret linear functions in function notation written in *standard form* (also modeling a problem in a context)			
F.LE.5: Interpret the parameters in a linear or exponential function in terms of a context. A.SSE.1: Interpret expressions that represent a quantity in terms of its context.	***Review*** • Each part of a function that models a problem in a context has its own meaning and units ***New*** • In a context, each part of a linear function in standard form has its own meaning and units	***Review*** • Interpret parts of an expression/function that models a linear relationship ***New*** • Interpret parts of an expression/function that models a linear relationship in standard form			

Lesson material Link
https://www.dropbox.com/s/w4qqstfrrh11e78/Lesson%201.docx?dl=0

Algebra 1 Unit 2 – Tier 1

Lesson 2

Lesson 2: Least Squares Regression (Line of best fit)

Objectives

- By working on a real –world problem, students will
  * learn the skill to create scatter plot on a graphing calculator
  * decide the least squares regression (line of the best fit) to model the problem data
  * interpret the equation of the line of best fit in terms of the problem situation
  * Use the best fit line equation to do interpolation and extrapolation to estimate data
  *understand the meaning of correlation for a linear regression line
  *use graphing calculator to fine the correlation coefficient or a linear regression
  * interpret correlation coefficient for a data set

Focused Mathematical Practices

- MP 1: Make sense of problems and persevere in solving them
- MP 2: Reason abstractly and quantitatively
- MP 4: Model with mathematics

Vocabulary

Scatter plot, Linear egression, Least squares regression, Interpolation, Extrapolation, Positive association, Negative association, No association, correlation, correlation coefficient

Common Misconceptions

- Student might think about the positive correlation coefficient always has stronger correlation than negative correlation coefficient (Teaching strategy: when comparing the correlation with two linear regression, indicate the absolute value of the correlation coefficient closer to 1 is stronger)
- Students might think the coefficient of x on the equation is correlation coefficient

Lesson Clarifications

- The main concept of the lesson is "we can use a mathematical model to represent data on two quantities"
- Students will use GRAPHING calculator to create scatter plot, find the line of best fit (not spend time to plot the points manually) and use graphing calculator to find the correlation coefficient and ONLY Interpret correlation coefficient. ***Correlation is not addressed in the task. Please do a mini lesson on correlation after the task.***

NJSLS	**Concepts** What students will know	**Skills** What students will be able to do	Material/ Resource	Suggested Pacing	
S.ID.6a: Fit a function to the data; use functions fitted to data to solve problems in the context of the data. Use given functions or choose a function suggested by the context. Emphasize linear, quadratic, and exponential models. S.ID.6b: Fit a linear function for a scatter plot that suggests a linear association. S.ID.7: Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data	***Review*** • Equations can be used to model relationships between quantities • Understand the meaning of rate of change (slope) for a situation given ***New*** • If there is a linear association between the independent and dependent variables of a data set, you can us a linear regression to make predictions within the data. • Understand the concept of interpolation and extrapolation	***Review*** • Evaluate linear expression for a given value • Solve linear equations ***New*** • Use graphing calculator to create a scatter plot, find the line of best fit • Use the line regression line (line of the best fit) to predict data • Interpret meaning of slope and intercept for the linear regression line in terms of context given	Module 1 Topic 3 CLST lesson 4.1 **Task 2**	2 to 3 days	

Lesson Material Link :https://www.dropbox.com/s/og8s6iofk6ukmi8/Lesson%202.docx?dl=0

Revised 12/19/19

Lesson 3

Lesson 3: Solving systems graphically and using equal value method (y = y)

Objectives

- After investigating several real world examples, students will solve systems of equations graphically and algebraically (Equal value method y = y)by scoring ____ out of ____ correctly on an exit ticket.

Focused Mathematical Practices

- MP 1: Make sense of problems and persevere in solving them
- MP 4: Model with mathematics

Vocabulary

- System of equations
- Substitution method
- Equal value method

Common Misconceptions

- Students may struggle with contextualizing each problem. Be prepared to provide strategies for student's ability to do MP 1. Also look for opportunities to make connections to the Pumpkin Problem.

Lesson Clarifications

- It is suggested to break up the three days by the three problems in this section.
- These lessons provide opportunities to incorporate a mini lesson on fractions and decimals.
- Split the Assessment Checkpoint up over 3 days, as necessary.

NJSLS	**Concepts** What students will know	**Skills** What students will be able to do	Material/ Resource	Suggested Pacing	Assessment Check Point
A.REI.6: Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables. A.REI.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). A.REI.11: Explain why the *x*-coordinates of the points where the graphs of the equations $y = f(x)$ and $y = g(x)$ intersect are the solutions of the equation $f(x) = g(x)$; find	***Review*** • Equations can be used to model a system of equations and/or to represent constraints. • Graphs represent all solutions of the function they represent. ***New*** • The point of intersection of a system of equations represents the solution and can be verified algebraically • Using the transitive property, part of one equation of a system can be substituted into the other in order to solve for a single variable • A system of equations	***Review*** • Graph linear equations • Create equations to model a problem in a context • Solve equations ***New*** • Solve a system of equations by graphing • Solve a system of equations algebraically • Classify systems of equations by the nature of their solutions	Task 4	2 days	CL SP 6.1 #'s Vocab, 2, 14, 15, 17

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. A.CED.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*.	with infinite solutions is just two equations that are multiples of one another.				

Material Link
https://www.dropbox.com/s/o9ee5zoq5vcic8e/Lesson%203.docx?dl=0

Algebra 1 Unit 2 – Tier 1

Lesson 4

Lesson 4: Solving systems using linear combinations

Objectives

- After investigating a problem about vacation packages, students will create and solve systems of equations that model a problem situation by scoring ____ out of ____ correctly on an exit ticket.

Focused Mathematical Practices

- MP 1: Make sense of problems and persevere in solving them
- MP 4: Model with mathematics

Vocabulary

- Linear combinations method (elimination)

Common Misconceptions

- Students will struggle with this if they don't have strong skills in solving equations and properties of equality. Be prepared to incorporate a quick review before this lesson. (i.e. does the equality of an equation change if I multiply both sides by a certain value?)

Lesson Clarifications

- Substitution method was covered in Grade 8 (8.EE.8)

NJSLS	**Concepts** What students will know	**Skills** What students will be able to do	Material/ Resource	Suggested Pacing	Assessment Check Point
A.REI.6: Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables. A.CED.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*.	***Review*** • Equations can be used to model a system of equations and/or to represent constraints. ***New*** • A system of equations can be manipulated (using operations such as multiplication and division) in order to be added or subtracted with one another. This process can eliminate variables and make it possible to find the value of a single variable	***Review*** • Create equations to model a problem in a context • Solve systems of equations by graphing or substitution ***New*** • Solve a system of equations using linear combinations	CL ST Module 2 Topic 3 Lesson 2.1, 2.2, 2.3, 2.4 Additional Practices are available	3 days	Day 1: CL SA 6.2 Day 2: CL SP 6.2 #'s 8, 14

Material Link

https://www.dropbox.com/s/yi2j428ogb1fjzn/Lesson%204.docx?dl=0

Revised 12/19/19

Lesson 5

Lesson 5: Identifying number of solution graphically and algebraically

Objectives

- After investigating several real world problems, students will create and solve systems of equations that model a problem situation by scoring ____ out of ____ correctly on an open-ended task.

Focused Mathematical Practices

- MP 1: Make sense of problems and persevere in solving them
- MP 4: Model with mathematics

Vocabulary

- Consistent systems, Inconsistent systems, Infinite solution, No solution, Parallel lines, Coinciding line

Common Misconceptions

Lesson Clarifications

- Students need to be able to determine the number of solution algebraically and graphically

NJSLS	**Concepts** What students will know	**Skills** What students will be able to do	Material/ Resource	Suggested Pacing	Assessment Check Point
A.REI.5: Prove that, given a system of two equations in two variables, replacing one equation by the sum of that equation and a multiple of the other produces a system with the same solutions. A.REI.6: Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables. A.CED.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*.	***Review*** • Equations can be used to model a system of equations and/or to represent constraints. • A system of equations can be manipulated (using operations such as multiplication and division) in order to be added or subtracted with one another. This process can eliminate variables and make it possible to find the value of a single variable ***New*** • Definition of parallel lines. • Coinciding lines	***Review*** • Create equations to model a problem in a context • Solve systems of equations by graphing or substitution • Solve a system of equations using linear combinations ***New*** • Algebraically determine the number of solution	CL ST Task: Module 2 Topic 3 Lesson 1.3	2 days	CL SA 6.3 #1

Lesson 6

Lesson 6: Rich Task (Pumpkin problem)

Objectives

- By working in pairs on a rich task, students will solve a system of linear equations using multiple representations by achieving a score of ___ on a rubric.]

Focused Mathematical Practices

- MP 1: Make sense of problems and persevere in solving them
- MP 2: Reason abstractly and quantitatively
- MP 4: Model with mathematics
- MP 7: Look for and make use of structure

Vocabulary

- System of equations

Lesson Clarifications

- The task itself will serve as the assessment checkpoint. Although it can be done in small groups, it serves as an introductory/diagnostic task for the systems of equations topic.

CCSS	**Concepts** What students will know	**Skills** What students will be able to do	Material/ Resource	Suggested Pacing	Assessment Check Point
A.REI.6: Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables. A.CED.2: Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales. A.CED.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*.	***Review*** • Equations can be used to model relationships between quantities ***New*** • Equations can be used to model a system of equations and/or to represent constraints • Solutions to a system of equations are the values that make both equations (or constraints) true.	***Review*** • Create equations to model a problem in a context ***New*** • Create equations to model a system of equations in a context • Solve a system of equations • Interpret solutions as being viable or non-viable • Verify if a set of values is a solution to a system of equations (or constraints)	Pumpkin Problem (located in SR) Task 3	1 day	The task itself will serve as the assessment checkpoint.

Algebra 1 Unit 2 – Tier 1

Lesson 7

Lesson 7: Solving and Graphing inequalities

Objectives

- Using a basketball problem as launch, students will create and graph linear inequalities and represent/interpret their solutions on a coordinate plane and will score ___ out of ____ correctly on an exit ticket.

Focused Mathematical Practices

- MP 4: Model with mathematics

Vocabulary

- Half plane, linear inequality

Common Misconceptions

- Students may struggle with understanding the different/similarities between a linear equation and a linear inequality
- Students may struggle with knowing which half plane to shade

Lesson Clarifications

NJSLS	**Concepts** What students will know	**Skills** What students will be able to do	Material/ Resource	Suggested Pacing	Assessment Check Point
A.REI.12: Graph the solutions to a linear inequality in two variables as a half-plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes. A.CED.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*.	***Review*** • Graphs represent all solutions of the function they represent. • Definition of at most and at least ***New*** • Solutions to linear inequalities are represented by a half-plane and sometimes include the boundary line (defined by the inequality sign) • Certain problems in a context are best represented as a linear inequality	***Review*** • Graph linear equations • Standard form of linear equation and Slope intercept form of linear equation ***New*** • Graph linear inequalities • Interpret and understand solutions to linear inequalities • Create a linear inequality to model a problem situation	Module 2 Topic 3 Lesson CL ST 3.1 CLST 3.2 CLST 3.3 Task 6	3 days	

Lesson 8

Lesson 8: Systems of linear inequalities

Objectives

- Using a basketball problem as launch, students will represent and interpret solutions to linear inequalities on a coordinate plane and will score ___ out of ____ correctly on an exit ticket.

Focused Mathematical Practices

- MP 4: Model with mathematics

Vocabulary

- Half plane, linear inequality, constraints, solution of a system of linear inequalities

Common Misconceptions

- Students may struggle with understanding how the graph of a system of inequalities represents the solution (i.e. they may not make the connection between the overlapping shaded areas and all (x,y) pairs that make the system true)

Lesson Clarifications

- It is suggested to break up the lesson into one problem each day

NJSLS	**Concepts** What students will know	**Skills** What students will be able to do	Material/ Resource	Suggested Pacing	Assessment Check Point
A.REI.12: Graph the solutions to a linear inequality in two variables as a half-plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes. A.CED.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*	***Review*** • Solutions to linear inequalities are represented by a half-plane and sometimes include the boundary line (defined by the inequality sign) • Certain problems in a context are best represented as a linear inequality ***New*** • The solutions to a system of linear inequalities is the intersections of the corresponding half-planes • Systems of linear inequalities can model problems and/or constraints in real world contexts	***Review*** • Graph linear inequalities • Interpret and understand solutions to linear inequalities • Create a linear inequality to model a problem situation ***New*** • Graph systems of linear inequalities • Interpret and understand solutions to systems of linear inequalities • Create a system of linear inequalities to model a problem in a context	Module 2 Topic 3 Lessons 4.1, 4.2, 4.3, 4.4	3 days	CL SP 7.2 #'s vocab, 2, 8, 9, 15

5 Practices

5 Practices for Orchestrating Productive Mathematics Discussions	
Practice	Description/ Questions
1. Anticipating	What strategies are students likely to use to approach or solve a challenging high-level mathematical task? How do you respond to the work that students are likely to produce? Which strategies from student work will be most useful in addressing the mathematical goals?
2. Monitoring	Paying attention to what and how students are thinking during the lesson. Students working in pairs or groups Listening to and making note of what students are discussing and the strategies they are using Asking students questions that will help them stay on track or help them think more deeply about the task. (Promote productive struggle)
3. Selecting	This is the process of deciding the *what* and the *who* to focus on during the discussion.
4. Sequencing	What order will the solutions be shared with the class?
5. Connecting	Asking the questions that will make the mathematics explicit and understandable. Focus must be on mathematical meaning and relationships; making links between mathematical ideas and representations.

Algebra 1 Unit 2 – Tier 1

Ideal Math Block

The following outline is the department approved ideal math block for grades 9-12.

1) Do Now (7-10 min)
    a. Serves as review from last class' or of prerequisite material
    b. Provides multiple entry points so that it is accessible by all students and quickly scaffolds up

2) Starter/Launch (5 min)
    a. Designed to introduce the lesson
    b. Uses concrete or pictorial examples
    c. Attempts to bridge the gap between grade level deficits and rigorous, on grade level content
    d. Provides multiple entry points so that it is accessible by all students and quickly scaffolds up

3) Mini-Lesson (15-20 min)
    a. Design varies based on content
    b. May include an investigative approach, direct instruction approach, whole class discussion led approach, etc.
    c. Includes CFU's
    d. Anticipates misconceptions and addresses common mistakes

4) Class Activity (25-30 min)
    a. Design varies based on content
    b. May include partner work, group work/project, experiments, investigations, game based activities, etc.

5) Independent Practice (7-10 min)
    a. Provides students an opportunity to work/think independently

6) Closure (5-10 min)
    a. Connects lesson/activities to big ideas
    b. Allows students to reflect and summarize what they have learned
    c. May occur after the activity or independent practice depending on the content and objective

7) DOL (5 min)
    a. Exit ticket

Algebra 1 Unit 2 – Tier 1

Ideal math block with Intervention Stations

Whole Group Instruction	50 min	INSTRUCTION (Grades 9 – 12) Daily Routine: Mathematical Content or Language Routine Anchor Task: Anticipate, Monitor, Select, Sequence, Connect Collaborative Work* Guided Practice Independent Work (Demonstration of Student Thinking)	TOOLS Manipulatives RESOURCES Agile Mind	
Rotation Stations (Student Notebooks & Chromebooks Needed)	1-2X 35 min	STATION 1: Focus on current Grade Level Content STUDENT EXPLORATION* Independent or groups of 2-3 Emphasis on MP's 3, 6 (Reasoning and Precision) And MP's 1 & 4 (Problem Solving and Application) TOOLS/RESOURCES Agile Mind Math Journals	STATION 2: Focus on Student Needs TECH STATION Independent TOOLS/ RESOURCES Khan Academy Approved Digital Provider Fluency Practice	TEACHER STATION: Focus on Grade Level Content; heavily scaffolded to connect deficiencies TARGETED INSTRUCTION 4 – 5 Students TOOLS/ RESOURCES Agile Homework Manipulatives
	5 min	INSTRUCTION Exit Ticket (Demonstration of Student Thinking) TOOLS/RESOURCES Notebooks or Exit Ticket Slips		

Algebra 1 Unit 2 – Tier 1

Sample Lesson Plan

Lesson	Lesson 1: Standard form of a linear equation (Day 1)	**Days**	1
Objective	After investigating a problem on selling tickets, students will **create and interpret** a linear function written in standard form with at least ___ out of ___ parts answered correctly on an opened ended problem.	**NJSLS**	A.CED.1, A.CED.2, F.BF.1a, F.IF.2, F.LE.5, A.SSE.1
Learning activities/strategies	**Do Now:** • Students complete problems 1-2 on Notebook slide #1. **Starter/Launch:** • Students work on the Let's Get Started using Notebook slide #3. They answer simple questions that give context to the upcoming problem situation. **Mini lesson (CL ST 3.2, pg 174):** • Teacher models 1a using the Notebook slide #4. Students complete 1b-1c exactly the same way. • Students complete #'s 2-3 in their books. Teacher calls on several students to answer #4 verbally. • Student reads aloud the example on page 175. • Teacher writes down "guesses" for the answer to #5, and then demonstrates how the units of f(s, a) are dollars (break down each part of 5s + 10a to show this) on Notebook slide #5. After demonstration, students then write down their complete answer/explanation to #5. • Teacher models #6a using Notebook slide #6. Students complete 6b-6d exactly the same way. • Students do a think-pair-share for #'s 7-8. Teacher calls on several pairs to share their response to #8. **Class activities:** • Students work in pairs or small groups to complete #'s 1-4. (some groups may require extra assistance) • Teacher has groups periodically go up to the SMART board to fill out parts of #3 using Notebook slide #7. • Teacher emphasizes that #4 requires a logical, clear explanation that is supported by mathematical evidence and reasoning. Teacher provides feedback to answers that may not be incorrect, but could be improved with more evidence/reasoning. • Teacher preselects 2-3 students to share their exemplary answer to #4, and uses a document camera to display their write up. **Independent Practice:** • Students work on the extended problem on page 185, #'s 1-5 (#'s 4 and 5 may be modified) • Students work independently and quietly, as this also serves as the assessment checkpoint. Teacher provides assistance only where really needed, and communicates to students that part of this lesson is working on MP 1. **Closure:** • How is today's lesson different and similar to past lessons where we looked at linear relationships?		

	• What are some skills that you learned or practice from today's lesson? **DOL (exit ticket):** • The assessment checkpoint will occur during the independent practice • HW is CL SP 3.2, #'s 8-10 and 14-16
Assessment	Formative: Exit ticket and CFU's Summative: Unit 2 Assessment and Checkup #1 Authentic:
Common Misconceptions	

Algebra 1 Unit 2 – Tier 1

Authentic Assessment

Reasoning with Systems

https://www.dropbox.com/sh/0oxzdurlvksnlgb/AABiuGvhyoAd-c18fqH_4GF4a?dl=0

Fishing adventure task

https://www.dropbox.com/sh/qifqdefesx2v609/AABLv4Z4heqjAwH54u-kExM5a?dl=0

Algebra 1 Unit 2 – Tier 1

Extended Constructed Response (ECR)

Math Department ECR Protocol

ECR Protocol

(Extended Constructed Response)

Issuing

- Moving forward ECR'S will be disseminated by the first of each month and collected by the end of each month
- Method of Issuing: email and post on the website

Dissemination

- Teachers can elect to print copies for each student or use the Smartboard to project the ECR. (Note: Student work will be included in Student Portfolios)
- Students should be given up to 30 minutes depending on the complexity of the ECR
- Assure appropriate testing environment
- ECR should be completed independently

Scoring

- Conversion tables are available in the *Assessment & Data in Mathematics Bulletin* for genesis inputting purposes
- ECR's will count as Authentic Assessments
- Naming Protocol "Course Month ECR" (ex: Grade 6 October ECR)

Collection

- ECR's will be collected & kept in student portfolios
- Student work will be reviewed during CPT's

November ECR

https://www.dropbox.com/s/bn315myox8gqdeh/Algebra%201%20ECR%20November%20%28Tier%201%20and%202%29.docx?dl=0

December ECR

https://www.dropbox.com/s/2kmha3o4e94wkrh/Alg%201%20ECR%20December.docx?dl=0

ECR Conversion Chart

Points	Genesis Conversion	Points	Genesis Conversion	Points	Genesis Conversion
0	55	0	55	0	55
1	59	1	69	1	69
2	69	2	79	2	89
3	79	3	89	3	100
4	89	4	100		
5	100				

NJSLA SAMPLE ITEMS

Item I – A.REI.6 No calculator

Part A

At a clothing store, Ted bought 4 shirts and 2 ties for a total price of $95. At the same store, Stephen bought 3 shirts and 3 ties for a total price of $84. Each shirt was the same price, and each tie was the same price. Which system of equations can be used to find s, the cost of each shirt in dollars, and t, the cost of each tie in dollars?

A. $\begin{cases} 6(s+t) = 95 \\ 3(s+t) = 84 \end{cases}$

B. $\begin{cases} 4s + 2t = 95 \\ 3s + 3t = 84 \end{cases}$

C. $\begin{cases} 7s + 5t = 179 \\ s + t = 12 \end{cases}$

D. $\begin{cases} 7s + 5t = 179 \\ 7s + 5t = 12(s+t) \end{cases}$

Part B

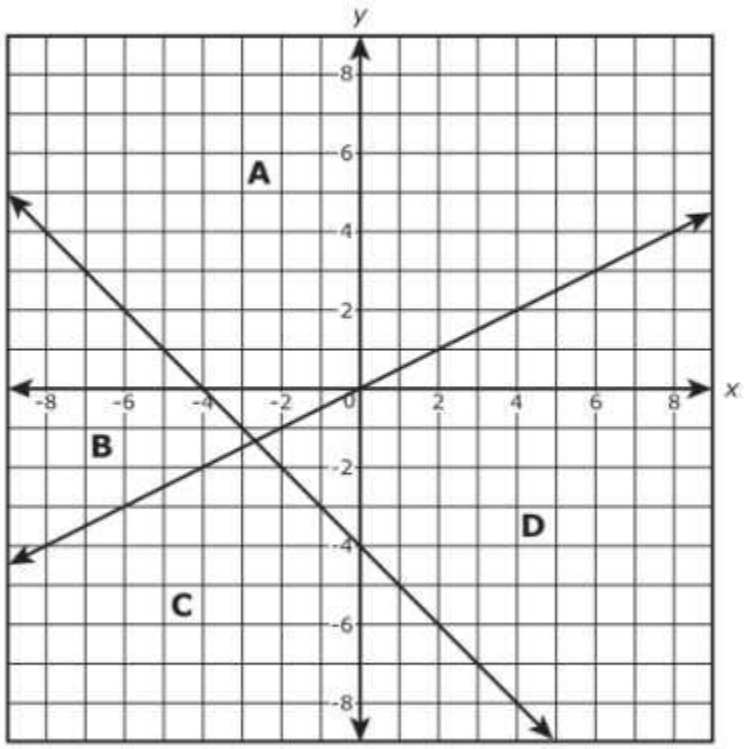
Linda bought 1 shirt and 2 ties at the same store. What is the total price, in dollars and cents, of Linda's purchase?

Enter your answer in the box.

Algebra 1 Unit 2 – Tier 1

Item 2: A.REI.3 No CALCULATOR

The system of inequalities $\begin{cases} x + y \leq -4 \\ 7x - 14y \leq 0 \end{cases}$ is graphed.



Which region in the graph represents the solution set of this system of inequalities?

Which region in the graph represents the solution set of this system of inequalities?

- A. Region A
- B. Region B
- C. Region C
- D. Region D

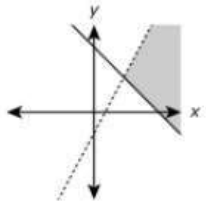
Item 3 – A.REI.3 No CALCULATOR

Which graph **best** represents the solution to this system of inequalities?

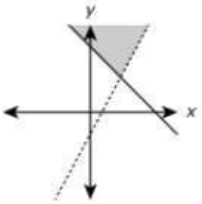
$x + y > 3$

$2x - y \geq 1$

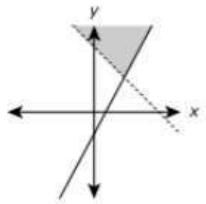
A.



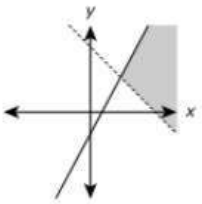
B.



C.



D.



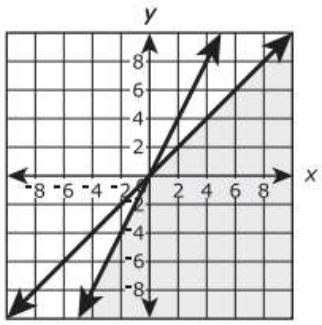
Item 4 – A.REI.3 No CALCULATOR

Which graph **best** represents the solution to this system of inequalities?

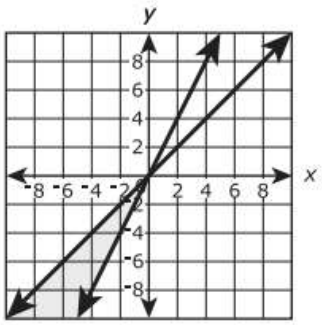
$x + y \leq 6$

$x + 2y \leq 8$

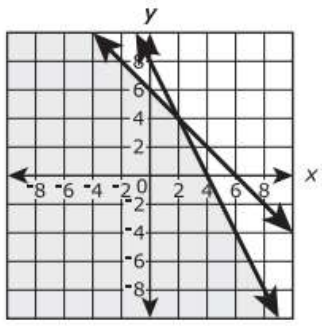
A.



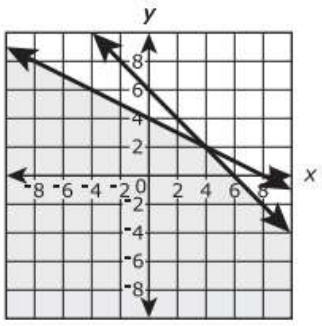
B.



C.



D.



Item 5 – A.REI.3 Calculator allowed

Members of a high school sports team are selling boxes of popcorn and boxes of pretzels for a fundraiser. They earn $2 for every box of popcorn they sell and $5 for every box of pretzels. The members want to earn at least $500 from all sales.

Let *x* represent the number of boxes of popcorn sold and let *y* represent the number of boxes of pretzels sold.

Part A

What inequality represents the number of boxes of popcorn and the number of boxes of pretzels that need to be sold to reach the goal of earning at least $500?

- A. $2x + 5y \geq 500$
- B. $5x + 2y \geq 500$
- C. $(2 + x)(5 + y) \geq 500$
- D. $(5 + x)(2 + y) \geq 500$

Part B

A line exists that serves as the boundary for the points making up the solution set of the inequality representing the numbers of boxes of popcorn and boxes of pretzels sold. Consider the line graphed in the *xy*-coordinate plane. What would be the interpretation, in context, of its slope?

- A. For every increase of 2 boxes of popcorn sold, 5 more boxes of pretzels need to be sold to earn $500.
- B. For every increase of 2 boxes of popcorn sold, 5 fewer boxes of pretzels need to be sold to earn $500.
- C. For every increase of 5 boxes of popcorn sold, 2 more boxes of pretzels need to be sold to earn $500.
- D. For every increase of 5 boxes of popcorn sold, 2 fewer boxes of pretzels need to be sold to earn $500.

(continues on next page)

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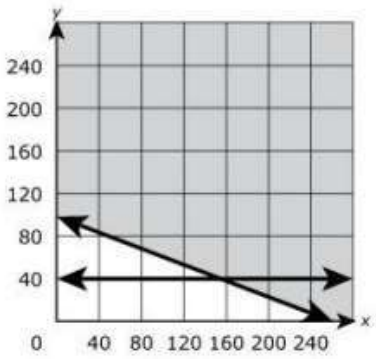
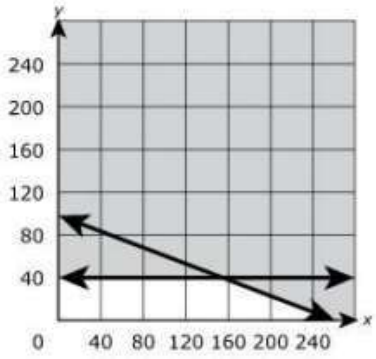
Part C

Members of the team believe they can sell at least 40 boxes of pretzels. Which graph represents the solution in the *xy*-coordinate plane of the system of inequalities that represents the numbers of boxes of popcorn and boxes of pretzels that need to be sold with the constraint that at least 40 boxes of pretzels will be sold?

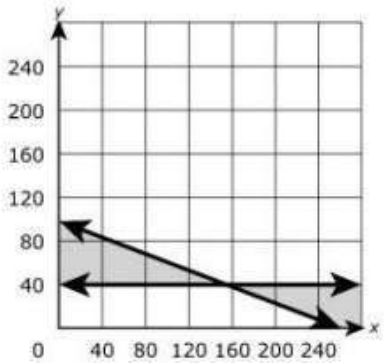
A.



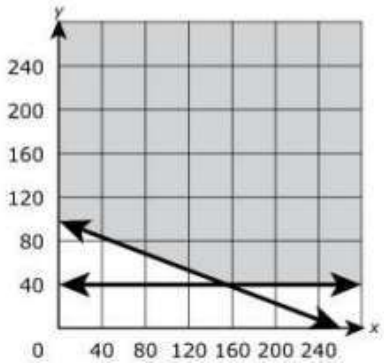
C.



B.



D.



Part D

For which combinations of boxes of popcorn and pretzels sold will the team meet the goal of earning at least $500?

Select **all** that apply.

- ☐ A. 30 boxes of popcorn and 80 boxes of pretzels
- ☐ B. 60 boxes of popcorn and 80 boxes of pretzels
- ☐ C. 75 boxes of popcorn and 70 boxes of pretzels
- ☐ D. 80 boxes of popcorn and 60 boxes of pretzels
- ☐ E. 100 boxes of popcorn and 60 boxes of pretzels

Item 6 – A.REI.3 NO calcualtor

Hayley bakes zucchini bread and banana bread. Some of the ingredients Hayley uses for each type of bread are shown in the tables.

Zucchini Bread
2 eggs
2 cups of flour
1.5 cups of sugar
0.5 stick of butter

Banana Bread
1 egg
3 cups of flour
2 cups of sugar
0.25 stick of butter

Part A

On Tuesday, Hayley only has 15 cups of flour and 9 eggs, but she has more than enough butter and sugar. Which system of linear inequalities can Hayley use to model this situation, where b represents the number of loaves of banana bread and z represents the number of loaves of zucchini bread?

A. $\begin{cases} 3b + z \leq 15 \\ 2b + 2z \leq 9 \end{cases}$

B. $\begin{cases} 5b + 3z \leq 15 \\ 3b + 5z \leq 9 \end{cases}$

C. $\begin{cases} 3b + 2z \leq 15 \\ b + 2z \leq 9 \end{cases}$

D. $\begin{cases} 2b + 2z \leq 15 \\ 3b + 5z \leq 9 \end{cases}$

Part B

What is the number of whole loaves of each type of bread Hayley should make in order to have the least amount of the 15 cups of flour and 9 eggs left over?

Enter your answers in the boxes. Enter **only** your answers.

Loaves of zucchini bread:

Loaves of banana bread:

(continues on next page)

Part C

On Friday, Hayley has purchased more flour and eggs, but only has 22 cups of sugar and 4 sticks of butter. Which combination of loaves of zucchini bread and banana bread can Hayley make?

- A. 8 loaves of zucchini bread and 4 loaves of banana bread
- B. 6 loaves of zucchini bread and 8 loaves of banana bread
- C. 2 loaves of zucchini bread and 12 loaves of banana bread
- D. 4 loaves of zucchini bread and 6 loaves of banana bread

Part D

She can sell zucchini bread for $4 and banana bread for $3. What is the **greatest** amount of money Hayley can collect by selling the bread made with 22 cups of sugar and 4 sticks of butter?

Enter your answer in the box.

$ [ ]

Item 7 – A.REI.3 Calculator allowed

A local salsa company makes two types of salsa, tomato and corn. **Each** batch of tomato salsa takes 2 hours to prepare and 4 hours to package. **Each** batch of corn salsa takes 2.5 hours to prepare and 3 hours to package. There are 4 preparation workers and 7 packaging workers in the company. **Each** of them works 40 hours per week.

Part A

Create a system of two inequalities that relates the number of batches of tomato salsa, t, and the number of batches of corn salsa, c, that can be made by the 4 preparation workers and the 7 packaging workers each week. Assume $t \geq 0$ and $c \geq 0$. You must select **two** inequalities.

Select **two** inequalities.

- ☐ A. $2t + 2.5c \leq 160$
- ☐ B. $2t + 4c \leq 160$
- ☐ C. $2t + 4c \leq 280$
- ☐ D. $2.5t + 3c \leq 160$
- ☐ E. $4t + 3c \leq 160$
- ☐ F. $4t + 3c \leq 280$

Part B

Which combinations of batches of salsa could be made in one week based on the constraints?

Select **all** that apply.

- ☐ A. 20 tomato and 45 corn
- ☐ B. 30 tomato and 40 corn
- ☐ C. 45 tomato and 30 corn
- ☐ D. 50 tomato and 25 corn
- ☐ E. 60 tomato and 10 corn

Part C

In order to maximize productivity, how many batches of salsa should be made if the company owner wants 20 batches of corn salsa?

Enter your answer in the box.

[ ] batches of tomato salsa and 20 batches of corn salsa

Part D

The company owner decides to only make corn salsa one week prior to a local festival. Given the same constraints, what is the maximum number of batches of corn salsa that can be made in one week?

Enter your answer in the box.

[ ] batches of corn salsa

Algebra 1 Unit 2 – Tier 1

Intervention Plan

Scope of Sequence				
Marking Period	MP 1 (9/9/19 – 11/13/19)	MP 2 (11/14/19- 1/30/20)	MP 3 (1/31/20-4/9/20)	**MP 4 (4/10-20-6/22/20)**
Unit Topic	Foundation of Algebra	Introduction to functions and equations	Rate of Change	Linear Functions
Description	Investigate the use of variables to represent unknowns and to generalize relationships. In addition, the unit also reviews important graphing skills of algebra.	Introduce different mathematical representation to represent patterns and relationships; and begin to use multiple representations of proportional and non-proportional situations.	Explore rate of change in motion problems and other situations; and model data sets that have a constant rate of change with a linear function.	**Make connection** with rate of change and slope. Introduce the linear function rule y=mx+b. Explore the value of m in the linear function rule and the relationships between slopes of parallel and perpendicular lines and connect the equations of lines to their graphs and descriptions.

Algebra 1 Unit 2 – Tier 1

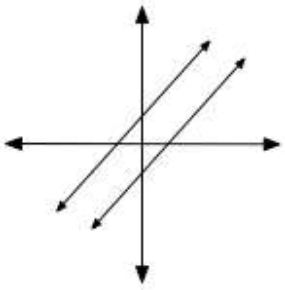
Marking Period 2 Intervention Overview

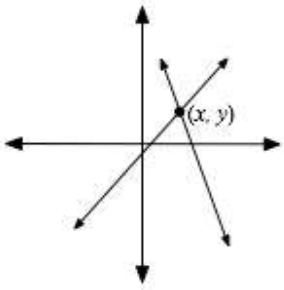
Student Learning Material: Agile Mind Intensified Algebra I: https://orange.agilemind.com

Topics	Number of lessons	Topic Descriptions	NJSLS
The material incorporates review and repair strategies for pre-algebra concepts and skills, standards prior to Algebra I have been included.			
4. Representing mathematical relationships in multiple ways	6-7 lessons	Students will extend their understanding of multiple representations in a way that will pay big dividends in Algebra I. They begin to learn to generate other, related representations when given a single representation of a pattern or relationship.	**6.NS.6**: Understand a rational number as a point on the number line. Extend number line diagrams and coordinate axes familiar from previous grades to represent points on the line and in the plane with negative number coordinates. **6.NS.C:** Represent and analyze quantitative relationships between dependent and independent variables**.** **A.SSE.1:** Interpret the structure of expressions
5. Problem solving and metacognition	5 lessons	Focus Skill work: Scaling graph axes.	**6.NS.6:** Understand a rational number as a point on the number line. Extend number line diagrams and coordinate axes familiar from previous grades to represent points on the line and in the plane with negative number coordinates.
6. Working with functions and equations	7-8 lessons	Introduce the concept of function as a dependency relationship between two variables, in which one depends on the other in a systematic way. Stuents also extend their understanding of functions to include representing sequences as functions	**6.EE.C: Represent and analyze quantitative** relationships between dependent and independent variables. **7.RP.A**: Analyze proportional relationships and use them to solve real-world and mathematical problems. **A.REI. D**: Represent and solve the graph of an equations and inequalities graphically. **F.IF.A**: Understand the concept of a function and use function notation **8.F.B**: Use functions to model relationships between quantities **N.Q.A**: Reason quantitative and use units to solve problems **F.IF.B**: Interpret functions that arise in applications in terms of the context **F.LE.A:** Construct and compare **linear,** quadratic, and exponential models and solve problem.

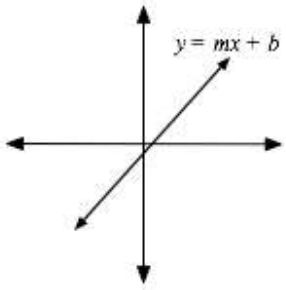
Algebra 1 Unit 2 – Tier 1

Multiple Representations

<table>
<tr><th colspan="2">System of Equations</th></tr>
<tr><td>Pictorial</td><td>
Parallel Lines

No points in common.
Solution: $\varnothing$

Intersecting Lines


One point in common.
Solution: (x, y)

Coincident Lines


Infinitely many points in common.
Solution: $\{(x, y): y = mx + b\}$
</td></tr>
<tr><td>Abstract</td><td>
Determine whether the solution set of the given system is the empty set, an infinite set, or a set with exactly one member: $\begin{cases} 3x = -3y - 9 \\ -4y = 4x + 12 \end{cases}$

First, we must find the slope and y-intercept for each equation:

Equation 1:
$3x = -3y - 9$
$3x + 9 = -3y$
$-x - 3 = y$
$y = -x - 3$
slope $= -1$
y-int. $= -3$

Steps:
1. Given
2. Add 9 to both sides
3. Divide both sides by 3
4. Place into slope-intercept form
5. State the slope
6. State the y-intercept

Equation 2:
$-4y = 4x + 12$
$y = -x - 3$
slope $= -1$
y-int. $= -3$

Steps:
1. Given
2. Divide both sides by -4
3. State the slope
4. State the y-intercept

Since the slopes and y-intercepts are the same, the lines are coincident. Therefore there are infinitely many solutions.

Determine whether the solution set of the given system is the empty set, an infinite set, or a set with exactly one member: $\begin{cases} 3x + y = -4 \\ 3x + y = 2 \end{cases}$

First, we must find the slope and y-intercept for each equation:

Equation 1:
$3x + y = -4$
$y = -3x - 4$
slope $= -3$
y-int. $= -4$

Steps:
1. Given
2. Subtract $3x$ from both sides
3. State the slope
4. State the y-intercept

Equation 2:
$3x + y = 2$
$y = -3x + 2$
slope $= -3$
y-int. $= 2$

Steps:
1. Given
2. Subtract $3x$ from both sides
3. State the slope
4. State the y-intercept

Since the slopes are the same but the y-intercepts are different, the lines are parallel. Therefore there is no solution.
</td></tr>
</table>

Determine whether the solution set of the given system is the empty set, an infinite set, or a s

with exactly one member: $\begin{cases} y = 3x + 1 \\ 4y - x = 4 \end{cases}$

First, we must find the slope and y-intercept for each equation:

Equation 1:			**Steps:**
y	$=$	$3x+1$	1. Given
slope	$=$	3	2. State the slope
y-int.	$=$	1	3. State the y-intercept

Equation 2:			**Steps:**
$4y - x$	$=$	4	1. Given
$4y$	$=$	$x+4$	2. Add x to both sides
y	$=$	$\frac{1}{4}x+1$	3. Divide both sides by 4
slope	$=$	$\frac{1}{4}$	4. State the slope
y-int.	$=$	1	5. State the y-intercept

Since the slopes and y-intercepts are different, the lines are intersecting. Therefore there is exactly one solution.

Additional Resources

Performance Tasks				
CCSS	SMP	Dropbox location and filename	SAP	Link (original task and answer key)
		Orange 9-12 Math > Algebra 1 > Unit 2 > Supplemental Material > **Quinoa task**	Optional	https://www.illustrativemathematics.org/illustrations/936

Collaborative Activities				
CCSS	SMP	Dropbox location and filename	SAP	Link
A.REI.6 A.REI.12 A.CED.3	MP 1 MP 2 MP 3 MP 4	Orange 9-12 Math > Algebra 1 > Unit 2 > Supplemental Material > **Boomerang Activity** & **Boomerang Slides**	No	http://map.mathshell.org.uk/materials/download.php?fileid=1241 (Lesson plan materials)
A.REI.6 A.CED.3	MP 2 MP 3	Orange 9-12 Math > Algebra 1 > Unit 2 > Supplemental Material > **Boomerang Activity** & **Boomerang Slides**	No	http://map.mathshell.org.uk/materials/download.php?fileid=669 (Lesson plan materials)

Appendix A – Acronyms

#	Acronym	Meaning
1	AA	Authentic Assessment
2	AM	Agile Minds
3	AR	Additional Resources
4	NJSLS	New Jersey Student Learning Standards
5	CFU	Check for understanding
6	CL	Carnegie Learning
7	CL SA	Carnegie Learning Student Assignments
8	CL SP	Carnegie Learning Skills Practice
9	CL ST	Carnegie Learning Student Text
10	EOY	End of Year (assessment)
11	MP	Math Practice
12	MYA	Mid-Year Assessment (same as PBA)
13	PBA	Problem Based Assessment (same as MYA)
14	PLD	Performance Level Descriptors
15	SAP	Student Assessment Portfolio
16	SMP	Standards for Mathematical Practice