

Summit Public Schools

Summit, New Jersey

Grade Level High School/ Content Area: Mathematics

Length of Course: Full Academic Year

Curriculum: Foundations of Algebra

Developed by:
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2019

Course Description: This course represents the first part of a two-year course. It will provide students the opportunity to truly master algebraic and mathematics skills that will lead to greater achievement in subsequent courses. Students will create and use numerical, algebraic, graphical, and verbal representations and analyze sophisticated patterns, relations, and functions. They will represent linear functions numerically, algebraically, graphically and verbally and work with and interpret these representations. They will deepen their understanding of relations and functions and expand their repertoire in working with them. Students will develop insight and understanding of the algebraic properties that govern the manipulation of symbols in expressions, equations, and inequalities. Functions will be introduced as mathematical modeling tools providing students with a versatile and powerful means for analyzing and solving complex, multi-step, real world problems. Students will also learn the appropriate use of technology, such as graphing calculators and spreadsheet utilities to model and analyze a wide range of mathematical relationships.

Texts and Resources:

Big Ideas Math: Algebra 1 (Big Ideas Learning. ©2016)

Standards:

New Jersey Student Learning Standards (2016)

(<http://www.state.nj.us/education/cccs/2016/math/>)

**Anticipated Timetable for Foundations of Algebra
Quarter 1**

Unit 1

Topic Developing Number Sense and Modeling Relations	Time Frame
Modeling Relations with variables	1
Order of operations	1
Adding and subtracting integers	1
Quiz	1
Absolute Value	1
Multiplying and dividing signed numbers	2
Application practice	1
Quiz Review	1
Quiz	1
Exponents	2
Adding and subtracting fractions	2
Multiplying and dividing fractions	2
Test Review	1
Test	1
Total	18 days

Unit 2

Topic Solving Linear Equations	Time Frame
Solving one-step equations including word problems	2
Two-step equations and combining like terms	2
Distributive Property in multi-step equations	1
Word problems practice with multi-step equations	1

Equations with variables on both sides including grouping symbols	2
Identity and No Solution Equations	1
Word problem practice	1
Quiz Review	1
Quiz	1
Solving Absolute Value Equations	1
Solving Absolute Value Equations with operations outside of Absolute Value symbol and word problems with Absolute Values	1
Absolute Value Equations with two Absolute Values and with special solutions	1
Solving literal equations for different variables	2
Using formulas for area and volume	1
Unit review	2
Unit Test	1
Total	21 days

Quarter 2

Unit 3

Topic Percents and Ratios	Time Frame
Ratios and Proportions	1
Using percents to develop equations	2
Quiz Review	1
Quiz	1
Project applying percents including presentations	3
Total	8

Unit 4

Topic Solving Linear Inequalities	Time Frame
Writing and graphing simple inequalities and testing a solution	1
Solving Inequalities with Addition and Subtraction including word problems	1
Solving Inequalities with Multiplication or Division including word problems	1
Two step and variables on both sides inequalities	2
Inequalities with distributive property and word problems	1
Quiz Review	1
Quiz	1
Writing compound inequalities and solving “and” inequalities	1
Solving and graphing “and” & “or” inequalities	1
Solving absolute value inequalities that result in “and” & “or” solutions	1
Solving absolute value inequalities that result in special solutions	1
Word problems and absolute deviation	1
Chapter review	2
Chapter Test	1
Total	16 days

Quarter 3

Unit 5

Topic Graphing Linear Functions	Time Frame
Plotting ordered pairs and identifying quadrants	1
Determining if a relation is a function with tables and mapping	1

Determining if a relation is a function with graphs & define and identify Domain and Range of a function	1
Identify the independent and dependent variables	1
Identifying linear functions from tables, graphs, and equations	1
Checking solutions to linear equations and continuous vs. discrete domains	1
Writing equations in function notation and evaluating a function for a given domain	1
Solve and graph using function notation	1
Applying functions notation to application problems	1
Quiz review	1
Quiz	1
Introducing Standard Form, graphing using a table, x&y intercepts	1
Horizontal and Vertical lines	1
Writing Equations from word problems, graphing using x&y intercepts, interpreting graphs	1
Understanding and applying slope	1
Finding slope and y-intercept of a line or slope from two coordinates	1
Finding slope from a table and writing equations in slope intercept form	1
Solving for y to write in slope-intercept and graphing using slope-intercept	1
Chapter review	2
Chapter Test	1
Total	21

Unit 6

Topic Writing Linear Functions	Time Frame
Writing equations in slope-intercept form given the slope and y-intercept, or given a graph	2
Writing equations in slope-intercept form given a point and a slope	2
Quiz	1
Writing equations in slope-intercept form given two points	2
Linear models to solve problems	2
Writing equations of parallel lines	1
Writing equations of perpendicular lines	1
Practice of all types of equations	3
Practice of all types of equations with application	1
Test Review	1
Test	1
Total	17

Quarter 4**Unit 7**

Topic Solving Systems of Linear Equations	Time Frame
Introduction of a system of equations, solution of a system, and solving by graphing	1
Determining if a coordinate is a solution and solving by graphing equations in different forms	1
Solving by substitution when one variable is isolated	1
Solving by substitution by isolating a variable as the first step	1
Solving word problems using substitution	1

Solving by elimination with opposite coefficients	1
Multiplying equations using elimination	1
Solving word problems using elimination	1
No solution and infinitely many solution systems	1
Practice all types of systems and identifying when to use appropriate method	3
Quiz	1
Graphing Linear inequalities and using a test point to determine solutions	2
Graphing systems of linear inequalities	2
Special solutions to systems of linear inequalities	1
Chapter review	2
Chapter test	1
Application project using systems of equations	4
Total	25 days

Unit 8

Topic Data Analysis and Displays	Time Frame
Measures of Center and Variation	2
Box and Whisker Plots	2
Shapes of Distribution	2
Quiz Review	1
Quiz	1
Making a scatter plot and identifying a correlation	1

Drawing a line of fit and writing the equation for that line	1
Correlation coefficient, linear regression, and residuals	1
Two-Way Tables	2
Choosing a Data Display	1
Chapter review	2
Chapter test	1
Total	18

Unit 1: Developing Number Sense and Modeling Relations

Big Ideas: *Course Objectives / Content Statement(s)*

- Understand and apply basic computations of numbers.
- Understand and apply the concept of absolute value.
- Understand and apply computations of fractions.

<p>Essential Questions</p> <ul style="list-style-type: none"> • Can we develop basic algebraic skills so that they can be applied to real world application? • How can we apply absolute value to real world application? 	<p>Enduring Understandings</p> <p><i>What will students understand about the big ideas?</i></p> <p>Students will understand that...</p> <ul style="list-style-type: none"> • The Order of Operations can be applied to more complex problems. • Apply all computational skills to any type of number. • Absolute value implies a distance.
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Areas of Focus: Proficiencies**(Cumulative Progress Indicators)**

Students will:

- 6.EE Apply and extend previous understandings of arithmetic to algebraic expressions.
- Seeing Structure in Expressions A-SSE
- Arithmetic with Polynomials and Rational Expressions A -APR

Examples, Outcomes, Assessments

Instructional Focus:

Solving simple equations

- Modeling relations with variables
- Applying order of operations
- Adding, subtracting, multiplying and dividing numbers
- Adding, subtracting, multiplying and dividing fractions
- Understanding absolute value

Sample Assessments:

- Solve the equation: $\frac{-10}{27} + \frac{-1}{9}$
- Sample ECR Item:

*.Write a rule for the table below.***19.**

Hours Worked	5	10	15	20
Amount Paid	\$40	\$80	\$120	\$160

- 2 unit quizzes
- 1 unit test

Instructional Strategies:

- Use digital resources to aid in visualizing steps to solving equations..
- Use mnemonic devices to memorize the order of cancelling operations using inverses

Technology Integration

- Use a scientific calculator to explore multi-step problems. Introduce advanced functions (grouping symbols and memory functions).
- Digital textbook for instruction and support outside of the classroom.

Unit 2: Solving Linear Equations

Big Ideas: *Course Objectives / Content Statement(s)*

- Solve single variable linear equations using the order of operations and inverse operations.
- Identify equations with infinite or no solutions.

<p>Essential Questions</p> <ul style="list-style-type: none"> ● How does one apply the order of operations in complex, multi-step problems? ● How can one model real life situations with equations? 	<p>Enduring Understandings</p> <p><i>What will students understand about the big ideas?</i></p> <p>Students will understand that...</p> <ul style="list-style-type: none"> ● The Order of Operations can be applied to more complex problems. ● Inverse operations can be used to keep and equation balanced and isolate a variable. . ● Some equations will have an infinite number of solutions ● Some equations will have no solution. ● Application and the ability to provide meaning to complex problems.
<p>Areas of Focus: Proficiencies (Cumulative Progress Indicators)</p> <p>Students will:</p> <ul style="list-style-type: none"> ● 8.EE.C.7a 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) ● 8.EE.C.7b Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms. ● Creating Equations A -CED A. Create equations that describe numbers or relationships ● Reasoning with Equations and Inequalities A -REI A. Understand solving equations as a process of reasoning and explain the reasoning 	<p>Examples, Outcomes, Assessments</p> <p>Instructional Focus:</p> <p>Solving simple equations</p> <ul style="list-style-type: none"> ● Solving multi-step equations ● Solving equations with variables on both sides ● Solving absolute value equations ● Rewriting equations and formulas <p>Sample Assessments:</p> <div style="margin-left: 40px;"> $40 = -\frac{1}{3}(9x + 30) + 2$ <ul style="list-style-type: none"> ● Solve the equation: ● Sample ECR Item: </div> <p style="font-size: small;">You are a contractor and charge \$45 for a site visit plus an additional \$24 per hour for each hour you spend working at the site. Write and solve an equation to determine how many total hours you have to work to earn \$810 working at two separate work sites.</p> <ul style="list-style-type: none"> ● 1 unit quiz ● 1 unit test <p>Instructional Strategies:</p> <ul style="list-style-type: none"> ● Use digital resources to aid in visualizing steps to solving equations.. ● Use mnemonic devices to memorize the order of cancelling operations using inverses <p>Technology Integration</p> <ul style="list-style-type: none"> ● Use a scientific calculator to explore multi-step problems. Introduce advanced

	<p>functions (grouping symbols and memory functions).</p> <ul style="list-style-type: none"> Digital textbook for instruction and support outside of classroom
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Unit 3: Percents, Ratios, and Proportions

Big Ideas: *Course Objectives / Content Statement(s)*

- Solve single variable linear equations using the order of operations and inverse operations.
- Identify equations with infinite or no solutions.

<p>Essential Questions</p> <ul style="list-style-type: none"> How does one use ratio to model and solve a real world situation? How can we use percents in statistical analysis? 	<p>Enduring Understandings</p> <p><i>What will students understand about the big ideas?</i></p> <p>Students will understand that...</p> <ul style="list-style-type: none"> Ratios and proportions can you used to solve problems where comparisons are being made. Percents are a way to represent a value in comparison to a total.
<p>Areas of Focus: Proficiencies (Cumulative Progress Indicators)</p> <p>Students will:</p> <ul style="list-style-type: none"> Ratios and Proportional Relationships 7.RP A. Analyze proportional relationships and use them to solve real-world and mathematical problems. 	<p>Examples, Outcomes, Assessments</p> <p>Instructional Focus:</p> <p>Solving simple equations</p> <ul style="list-style-type: none"> Simplifying ratios Setting up and solving proportions Applying ratios and proportions to different situations Using percents to interpret and understand statistical information <p>Sample Assessments:</p> <ul style="list-style-type: none"> Solve the equation: $\frac{6}{x+4} = \frac{2}{7}$ Sample ECR Item: <p>A furniture store buys its merchandise at wholesale price and then marks up the price for retail 55%. If a couch is \$350 wholesale, what is the mark-up price?</p> <p>.</p> <ul style="list-style-type: none"> 1 unit test 1 unit project <p>Instructional Strategies:</p> <ul style="list-style-type: none"> Use digital resources to aid in visualizing steps to solving equations.. Use mnemonic devices to memorize the order of cancelling operations using inverses


	<p>Technology Integration</p> <ul style="list-style-type: none"> ● Use a scientific calculator to explore multi-step problems. Introduce advanced functions (grouping symbols and memory functions). ● Digital textbook for instruction and support outside of classroom
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Unit 4: Solving Linear Inequalities

Big Ideas: Course Objectives / Content Statement(s)

- Understand the meaning of inequalities and the mathematical rules that govern them.
- Identify when the solution set is inclusive of the boundary and how to show that visually and graphically. .
- Identify similarities and differences when solving equations and inequalities.
- Understand the differences between the different types of compound inequalities.
- Relate absolute value inequalities and compound inequalities.
- Relate the solutions to any simple or compound inequality to a graph or number line

<p>Essential Questions</p> <ul style="list-style-type: none"> ● What does an inequality represent? ● How can we determine if the boundary is included in the solution set? ● How can we use mathematical models to represent inequalities? ● What is the difference between the different types of compound inequalities? ● How can the different types of compound inequalities' solution sets be displayed on a number line? ● How are absolute value inequalities related to compound inequalities? 	<p>Enduring Understandings</p> <p><i>What will students understand about the big ideas?</i></p> <p>Students will understand that...</p> <ul style="list-style-type: none"> ● Inequalities follow a similar structure and order as equations. ● Solutions to inequalities represent a boundary and may be infinite.. ● Compound inequalities allow for more than one boundary and may be a representation of a union or intersection of the solution sets. ● Inequalities can be used to represent real world situations.
<p>Areas of Focus: Proficiencies (Cumulative Progress Indicators) Students will: <i>(Enter NJCCCS or Common Core CPI's here)</i></p> <ul style="list-style-type: none"> ● A.REI.A1 Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method. ● A.REI.B.3 Solve linear equations and inequalities in one variable, including equations with coefficients represented by 	<p>Examples, Outcomes, Assessments</p> <p>Instructional Focus: Solving inequalities (including compound inequalities)</p> <ul style="list-style-type: none"> ● Solving multi-step inequalities ● Solving compound inequalities ● Solving absolute value inequalities ● Modeling real life situations with inequalities <p>Sample Assessments:</p> <ul style="list-style-type: none"> ● 1 Unit Quiz and 1 Unit Test ● Solve the inequality and graph the solution:

letters.	$-3y > 9$ or $2y - 6 > 2$  <ul style="list-style-type: none"> You are planning a school carnival. The equipment costs \$180 to rent. You are planning to charge \$4.00 per ticket. You would like to have a profit of at least \$500. Write and solve an inequality that represents the number of tickets you need to sell. <p>Instructional Strategies:</p> <p>Interdisciplinary Connections</p> <ul style="list-style-type: none"> Use inequalities to model polling data for political elections Use inequalities to model the time frames associated with the phases of the moon <p>Technology Integration</p> <ul style="list-style-type: none"> Internet based question sets to model inequalities and the graphs of their solutions Use of SmartBoard to create drag and drop number lines to model solution sets
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Unit 5: Graphing Linear Functions

Big Ideas: *Course Objectives / Content Statement(s)*

- Define and identify functions
- Write equations using function notation
- Calculate the slope of a line
- Graph linear functions from a variety of equation forms

<p>Essential Questions</p> <p><i>What provocative questions will foster inquiry, understanding, and transfer of learning?</i></p> <ul style="list-style-type: none"> What characteristics of a relation makes it a function? How can you identify a function when given a table, graph, or equation? How can you calculate the slope of a line? What does the slope of the line represent? How do the different parts of a linear equation translate to a graph or table? 	<p>Enduring Understandings</p> <p><i>What will students understand about the big ideas?</i></p> <p>Students will understand that...</p> <ul style="list-style-type: none"> Functions have specific characteristics, that each element of the domain has one matching element of the range. Functions can be represented as equations, tables, or graphs. The slope of the line represents a constant rate of change. Linear equations can be used to model a variety of real life situations.
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Areas of Focus: Proficiencies

(Cumulative Progress Indicators)

Students will:

- Interpreting Functions F-IF A. Understand the concept of a function and use function notation
- Building Functions F-BF A. Build a function that models a relationship between two quantities
- Linear and Exponential Models F-LE A. Construct and compare linear and exponential models and solve problems
- Functions 8.F A. Define, evaluate, and compare functions.
- Interpreting Categorical and Quantitative Data S-ID A. Summarize, represent, and interpret data on a single count or measurement variable
- Expressions and Equations 8.EE A. Work with radicals and integer exponents.

Examples, Outcomes, Assessments

Instructional Focus:

- Define a function.
- Identify a function in different forms.
- Use function notation to write a linear equation.
- Calculate the slope of a line.
- Graph linear functions using slope intercept form.
- Graph vertical and horizontal lines
- Graph linear functions using standard form.
- Use linear functions to model and solve real life problems

Sample Assessments:

- 2 Unit quizzes, 1 Unit Test
- Determine whether the relation is a function.

Explain.

Input, x	9	7	5	3	1
Output, y	1	2	2	3	4

- The elevation h (in Feet) of a submersible is modeled by the function $h(t)=550t-11,000$, where t is the time (in minutes) since the submersible began to ascend. Identify and interpret the slope and y-intercept.

Instructional Strategies:

Interdisciplinary Connections

- Make a model of the relationship between Celsius and Fahrenheit temperatures. Represent the relationship as an equation, and check the equation against two known data points – 0 degrees C = 32 degrees F and 100 degrees C = 212 degrees F. Use the equation to convert between Celsius and Fahrenheit temperatures.

Technology Integration

- Using graphing calculators and desmos to provide a visual representation of the linear functions.

Global Perspectives

- Compare and contrast populations of various nations to determine % growth or decay. Students will determine other environmental

	or political factors that affect the population changes and determine of growth or decay is an example of a linear function.
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Unit 6: Writing Linear Functions

Big Ideas: *Course Objectives / Content Statement(s)*

- Write equations in slope intercept
- Convert equations into slope intercept form
- Know the characteristics and write equations of parallel and perpendicular lines
- Use linear equations to model trends in scatterplots

Essential Questions

What provocative questions will foster inquiry, understanding, and transfer of learning?

- How are the slope and y-intercept of a linear function represented on a graph?
- How are the slope and y-intercept of a linear function represented in an equation?
- How are the different forms of linear equations related?
- What are the advantages and disadvantages of each form of linear equations?
- How can linear equations be used to model trends in sets of data?
- What are the common characteristics of parallel and perpendicular lines when using graphs or equations?
- How can we apply writing linear equations to applicable settings?

Enduring Understandings

What will students understand about the big ideas?

Students will understand that...

- The slope of a line represents a rate of change, and controls the steepness of its graph.
- Linear equations can be manipulated using inverse operations to convert between formats.
- The y-intercept of a linear graph occurs when the x-value is 0 and is a common starting point for real life problems.
- That linear equations can be developed if given a slope and an ordered pair, two ordered pairs, or a slope and a y-intercept.

Areas of Focus: Proficiencies

(Cumulative Progress Indicators)

Students will:

(Enter NJCCCS or Common Core CPI's here)

- Reasoning with Equations and Inequalities A -REI A. Understand solving equations as a process of reasoning and explain the reasoning
- B. Solve equations and inequalities in one

Examples, Outcomes, Assessments

Instructional Focus:

- Write equations in slope-intercept form
- Convert equations from point-slope or standard form into slope intercept
- Write equations of parallel and perpendicular lines
- Write equations when given a slope and an

variable

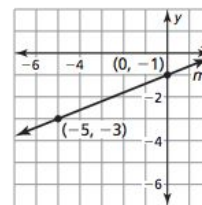
- Interpreting Categorical and Quantitative Data S-ID
- C. Interpret linear models
- Linear and Exponential Models F-LE A.
Construct and compare linear and exponential models and solve problems
- B. Interpret expressions for functions in terms of the situation they model

ordered pair

- Write equations when given two ordered pairs

Sample Assessments:

- Write the equation of the line represented by



the given graph:

- Determine if any of the following lines are parallel or perpendicular. Explain your

Line a : $(1, 5)$ and $(-2, -4)$

Line b : $(3, 2)$ and $(1, -4)$

conclusion: Line c : $(6, 1)$ and $(-4, 2)$

Tell whether the data in the table can be modeled by a linear equation. Explain. If possible, write a linear equation that represents y as a function of x .

x	3	5	12	20
y	7	10	16	26

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Instructional Strategies:

Interdisciplinary Connections

- Science: Creating a model to represent data.

Technology Integration

- Use a graphing calculator or software to graph linear equations.
- Use graphing calculator software to determine where the line crosses the x or the y axis.

Unit 7: Solving Systems of Linear Equations

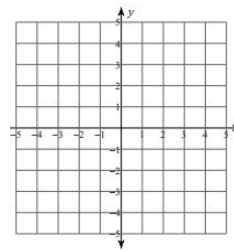
Big Ideas: *Course Objectives / Content Statement(s)*

- Solve systems of equations by graphing
- Solve systems of equations by using substitution
- Solve systems of equations by using elimination
- Identify systems of equations with infinite or no solutions
- Graph systems of linear inequalities

<p>Essential Questions</p> <p><i>What provocative questions will foster inquiry, understanding, and transfer of learning?</i></p> <ul style="list-style-type: none"> • Where on a graph can you identify the coordinate that is a solution to more than one equation simultaneously? • How can one use the rules of algebra to solve for the coordinate that is the solution to a system of equations? • What does the graph of a system of equations with infinite or no solutions look like? • What does the algebraic solution for infinite or no solution systems look like? • How does solving a system of linear inequalities differ from solving a system of equations? • What does it mean when solving a system of linear equations? • What does it mean when solving a system of linear inequalities? • When would it be useful to solve a system of linear equations/inequalities? 	<p>Enduring Understandings</p> <p><i>What will students understand about the big ideas?</i></p> <p>Students will understand that...</p> <ul style="list-style-type: none"> • A system of linear equations can have one solution, no solution, or infinite solutions. • Systems of equations can be solved by graphing, using substitution, or by using elimination. • Graphs of systems of equations can have one point of intersection, no points of intersection, or infinite points of intersection. • Systems of linear inequalities have infinite solutions. • Systems of linear inequalities are solved by graphing and shading the region of the graph that contains the coordinates that make the inequality true.
<p>Areas of Focus: Proficiencies (Cumulative Progress Indicators)</p> <p>Students will:</p> <p><i>(Enter NJCCCS or Common Core CPI's here)</i></p> <ul style="list-style-type: none"> • Creating Equations A -CED A. Create equations that describe numbers or relationships • Reasoning with Equations and Inequalities A -REI A. Understand solving equations as a process of reasoning and explain the reasoning • B. Solve equations and inequalities in one variable • C. Solve systems of equations • D. Represent and solve equations and inequalities graphically 	<p>Examples, Outcomes, Assessments</p> <p>Instructional Focus:</p> <ul style="list-style-type: none"> • Solve systems of equations by graphing • Solve systems of equations by using substitution • Solve systems of equations by using elimination • Solve systems of linear inequalities • Solve application problems using systems of equations/inequalities <p>Sample Assessments:</p> <ul style="list-style-type: none"> • Solve the system of equations by graphing:

$$y = \frac{1}{3}x - 3$$

$$y = -x + 1$$



PROBLEM SOLVING An investor owns shares of Stock A and Stock B. The investor owns a total of 200 shares with a total value of \$4000. How many shares of each stock does the investor own?

Stock	Price
A	\$9.50
B	\$27.00

- 2 Quizzes
- 1 Test
- 1 Project

Instructional Strategies:

Interdisciplinary Connections

- Social Studies: Use a system of equations to model cost and overhead of a business and determine when a business becomes profitable.
- Science: Use a system of equations to determine the amount of acid and water mixed to make 1L of 10% solution of hydrochloric acid.

Technology Integration

- Use a graphing calculator or software to graph systems of linear equations.
- Use graphing calculator software to determine the point of intersection of a system of equations.

Media Literacy

- Create three different application problems relevant to their lives. While doing so, create problems that vary in level of difficulty and with the approach that should be used.

Unit 8: Data Analysis and Displays

Big Ideas: *Course Objectives / Content Statement(s)*

- Measures of central tendency
- Box and whisker plots
- Standard deviation
- Skewed and symmetric displays
- Two way tables

Essential Questions

What provocative questions will foster inquiry, understanding, and transfer of learning?

- How can you interpret data displayed in a two way table?
- Which measure of central tendency best describes a set of data?
- Which type of data display is best used when given a set of data?
- What information does the standard deviation give?
- How can we display data in multiple ways in order to describe it?

Enduring Understandings

What will students understand about the big ideas?

Students will understand that...

- Data can be displayed in a variety of manners.
- Data displays can help to identify patterns, trends, and outliers in data.
- Linear equations can be useful to model trends in sets of data.
- Interpretation of data is essential when deciding on how to display it.

Areas of Focus: Proficiencies

(Cumulative Progress Indicators)

Students will:

(Enter NJCCCS or Common Core CPI's here)

- Interpreting Categorical and Quantitative Data
S-ID A. Summarize, represent, and interpret data on a single count or measurement variable
- B. Summarize, represent, and interpret data on two categorical and quantitative variables
- C. Interpret linear models
- Making Inferences and Justifying Conclusions
S-IC A. Understand and evaluate random processes underlying statistical experiments
- B. Make inferences and justify conclusions from sample surveys, experiments, and observational studies

Examples, Outcomes, Assessments

Instructional Focus:

- Construct two-way frequency tables and two-way relative frequency tables, and describe possible associations between two variables.
- Understand and articulate measures of central tendency.
- Represent data in various forms that can then be explained.

Sample Assessments:

- Find the mean, median, and mode of each set of data. Determine which represents the data best and explain why you made that choice.

Hours Spent Practicing		
8	$6\frac{3}{4}$	5
$5\frac{1}{2}$	4	$7\frac{1}{2}$

- Which measure of variation best represents the data, standard deviation or the 5 number summary?

Time (minutes)				
25	20	27	18	40
65	50	35	35	40
40	58	90	38	20

- Two Way tables question:

You conduct a survey that asks 350 students in your class about whether they prefer pizza or chicken for school lunch. One hundred eighty-nine males respond, 95 of which prefer pizza. Fifty-two females prefer the chicken.

- Organize the results in the two-way table provided.
- What percent of females like the pizza?

	Male	Female	Total
Pizza			
Chicken			
Total			

Instructional Strategies:

Interdisciplinary Connections

- Social Studies : Take a survey of the student body of which Presidential candidate they support during an election year and display the data in a two way table, Analyze the data and look for patterns and trends
- Science: Use a scatter plot to represent growth of plants. Use a trend line to determine if growth patterns are linear.

Technology Integration

- Google forms or similar survey web based resources to gather data on classmates and use the data to analyze and look for trends.
- Use a graphing calculator or software to graph linear equations. Compare and contrast the slopes in the equations and how they affect the graphs.

Global Perspectives

- Research census procedures in different parts of the world. Gather data from the most recent census where available and looks for patterns in demographics.

	<ul style="list-style-type: none"> Use linear equations to model the GDP growth or decay of a variety of countries. Determine if the linear models are appropriate for the situation.
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Supports for English Language Learners		
Sensory Supports	Graphic Supports	Interactive Supports
Real life objects	Charts	In pairs or partners
Manipulatives	Graphic Organizers	In triads or small groups
Pictures	Tables	In a whole group
Illustrations, diagrams & drawings	Graphs	Using cooperative group
Magazines & Newspapers	Timelines	Structures
Physical activities	Number lines	With the Internet / Software
Videos & Film		In the home language
Broadcasts		With mentors
Models & Figures		

Intervention Strategies		
Accommodations	Interventions	Modifications
Allow for verbal responses	Multi-sensory techniques	Modified tasks/expectations
Repeat/confirm directions	Increase task structure (e.g. directions, checks for understanding, feedback)	Differentiated materials
Permit response provided via computer or electronic device	Increase opportunities to engage in active academic responding	Individualized assessment tools based on student need
Audio Books	Utilize pre reading strategies and activities previews, anticipatory guides, and semantic mapping	Modified assessment grading

Career-Ready Practices:

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.

Summit Public Schools

Summit, New Jersey

Curricular Addendum

Career-Ready Practices

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Interdisciplinary Connections

- Close Reading of works of art, music lyrics, videos, and advertisements
- Use [Standards for Mathematical Practice](#) and [Cross-Cutting Concepts](#) in science to support debate/inquiry across thinking processes

Technology Integration

Ongoing:

- Listen to books on CDs, Playaways, videos, or podcasts if available.
- Use document camera or overhead projector for shared reading of texts.

Other:

- Use Microsoft Word, Inspiration, or SmartBoard Notebook software to write the words from their word sorts.
- Use available technology to create concept maps of unit learning.

Instructional Strategies: Supports for English Language Learners:

Sensory Supports	Graphic Supports	Interactive Supports
Real-life objects (realia)	Charts	In pairs or partners
Manipulatives	Graphic organizers	In triads or small groups
Pictures & photographs	Tables	In a whole group
Illustrations, diagrams, & drawings	Graphs	Using cooperative group structures
Magazines & newspapers	Timelines	With the Internet (websites) or software programs
Physical activities	Number lines	In the home language
Videos & films		With mentors
Broadcasts		
Models & figures		

from <https://wida.wisc.edu>

Media Literacy Integration

- Use multiple forms of print media (including books, illustrations/photographs/artwork, video clips, commercials, podcasts, audiobooks, Playaways, newspapers, magazines) to practice reading and comprehension skills.

Global Perspectives

- [The Global Learning Resource Library](#)

Differentiation Strategies:

Accommodations	Interventions	Modifications
Allow for verbal responses	Multi-sensory techniques	Modified tasks/ expectations
Repeat/confirm directions	Increase task structure (e.g., directions, checks for understanding, feedback)	Differentiated materials
Permit response provided via computer or electronic device	Increase opportunities to engage in active academic responding (e.g., writing, reading aloud, answering questions in class)	Individualized assessment tools based on student need
Audio Books	Utilize prereading strategies and activities: previews, anticipatory guides, and semantic mapping	Modified assessment grading