TOWNSHIP OF UNION PUBLIC SCHOOLS

Algebra I

Adopted: January 16, 2024

Unit 1A

Unit Title: Algebra 1 – Modeling with Linear Equations and Inequalities – Unit 1 - Module A

Grade level: 9   **Timeframe: 11 days**

Guiding Questions

1) What are the justifications for solving linear equations and inequalities?
2) What is a linear equation and inequality?
3) What are the building blocks of Algebra 1?

Standards

Standards (Taught and Assessed):

☐ **N.Q.A.2** Define appropriate quantities for the purpose of descriptive modeling.

■ **A.CED.A.1** Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions.

☐ **N.Q.A.1** Use units as a way to understand problems and to guide the solution of multi-step problems; Choose and interpret units consistently in formulas; Choose and interpret the scale and the origin in graphs and data displays.

■ **A.REI.B.3** Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.

■ **A.REI.A.1** Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.

■ **A.CED.A.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.*

☐ **N.Q.A.1** Use units as a way to understand problems and to guide the solution of multi-step problems; Choose and interpret units consistently in formulas; Choose and interpret the scale and the origin in graphs and data displays.

○ **N.RN.B.3** Explain why the sum or product of two rational numbers is rational; that the sum of a rational number and an irrational number is irrational; and that the product of a nonzero rational number and an irrational number is irrational.

☐ **N.Q.A.3** Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.

Key: ■ Major Cluster   ☐ Supporting Cluster   ○ Additional Cluster

Highlighted Career Ready Practices and 21st Century Themes/Skills

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.

CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.

CRP9. Model integrity, ethical leadership and effective management.

CRP11. Use technology to enhance productivity.

Career Awareness, Exploration, and Preparation Content Area: 21st Century Life and Careers Strand C: Career Preparation

9.2.8.B.3 Evaluate communication, collaboration, and leadership skills that can be developed through school, home, work, and extracurricular activities for use in a career.

9.2.8.B.4 Evaluate how traditional and nontraditional careers have evolved regionally, nationally, and globally.

9.2.8.B.5 Analyze labor market trends using state and federal labor market information and other resources available online.

9.2.8.B.7 Evaluate the impact of online activities and social media on employer decisions.

Career & Technical Education Content Area: 21st Century Life and Careers Standards

9.3.ST.2 Use technology to acquire, manipulate, analyze and report data.

9.3.ST-SM.4 Apply critical thinking skills to review information, explain statistical analysis, and to translate, interpret and summarize research and statistical data.

9.3.ST-SM.3 Analyze the impact that science and mathematics has on society.

Social-Emotional Learning Competencies

New Jersey Social and Emotional Learning Competencies and Sub-Competencies

Self-Awareness

- Recognize one's feelings and thoughts
- Recognize the impact of one's feelings and thoughts on one's own behavior
- Recognize one's personal traits, strengths, and limitations
- Recognize the importance of self-confidence in handling daily tasks and challenges

Self-Management

- Understand and practice strategies for managing one's own emotions, thoughts, and behaviors
- Recognize the skills needed to establish and achieve personal and educational goals
- Identify and apply ways to persevere or overcome barriers through alternative methods to achieve one's goals

Social Awareness

- Recognize and identify the thoughts, feelings, and perspectives of others
- Demonstrate an awareness of the differences among individuals, groups, and others' cultural backgrounds
- Demonstrate an understanding of the need for mutual respect when viewpoints differ
- Demonstrate an awareness of the expectations for social interactions in a variety of settings

Responsible Decision-Making

- Develop, implement, and model effective problem-solving and critical thinking skills
- Identify the consequences associated with one's actions in order to make constructive choices
- Evaluate personal, ethical, safety, and civic impact of decisions

Relationship Skills

- Establish and maintain healthy relationships
- Utilize positive communication and social skills to interact effectively with others
- Identify ways to resist inappropriate social pressure
- Demonstrate the ability to prevent and resolve interpersonal conflicts in constructive ways
- Identify who, when, where, or how to seek help for oneself or others when needed

*Adopted by the New Jersey State Board of Education in August 2017

CAR_Algebra 1-Unit 1-Module A august.2019

Instructional Plan

Pre-Assessment and Reflection

Pre-Assessment	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
Teacher-created exam on identifying expressions/equations, solving one-step equations, and identifying units based on context of problems.	Listed below.

Student Learning Objectives (SLO), Strategies, Formative Assessment, Activities and Resources (add rows as needed)

SLO – WALT We are learning to/that	Student Strategies	Formative Assessment	Activities and Resources	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
N.Q.A.2. - **WALT** define appropriate quantities to be used in descriptive modeling (1 day)	• Read the question to identify vocabulary words as context clues • Reference word walls	• Exit Ticket with examples of lines asking students to select appropriate units	• Students work in small groups with different problems, using mini whiteboards to represent the different quantities identified in groups.	**ELL** • Read written instructions • Students may be provided with note organizers/study guides to reinforce key topics. • Model and provide examples • Extended time on assessments when needed. • Establish a non-verbal cue to redirect students when not on task.

SLO – WALT We are learning to/that	Student Strategies	Formative Assessment	Activities and Resources	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
				• Students may use a bilingual dictionary. • Pair Visual Prompts with Verbal Presentations • Highlight Key Words & Formulas **SPED/504** • Students may be provided with note organizers / study guides to reinforce key topics. • Extended time on assessments when needed. • Preferred seating to be determined by student and teacher. • Provide modified assessments when necessary. • Students may complete assessments in

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SLO – WALT We are learning to/that	Student Strategies	Formative Assessment	Activities and Resources	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
				alternate settings when requested. • Establish a non-verbal cue to redirect students when not on task. • Maintain strong teacher / parent communication. • Repetition and practice • Pair Visual Prompts with Verbal Presentations • Provide Formulas • Check Use of Agenda **Gifted & Talented** • Use of Higher Level Questioning Techniques • Extension/Challenge Questions • Provide Assessments at a Higher Level of Thinking

SLO – WALT We are learning to/that	Student Strategies	Formative Assessment	Activities and Resources	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
				• Desmos Linear Activities - https://teacher.desmos.com/linear **At Risk** • Student contracts • Consistent communication with parents and counseling team.

A.REI.A.1. - WALT solve one-variable linear equations that have coefficients represented by letters
 	
A.CED.A.1. - WALT create linear equations in one variable to model a problem or situation
 	
A.REI.A.1. - WALT explain each step in solving a simple equation, assuming it has a solution
 	
(2 days)
	• Identify the operations performed on desired variable to solve for
	• Identify the operations needed to reverse the operations performed on the desired variable
	• Define the properties of equality, commutative property, associative property, and distributive property.
	• Reference the word wall.
		Exit Ticket - Day 1
		
		Solve the equation below: Solve the equation by reversing the operations that were done to the variable
		$$7(y + 5) - 2 = 12$$
		
		Exit Ticket - Day 2
		
		$5(x + 2) = 30$
		Step 1: $5x - 10 = 30$ Justification: _____
		Step 2: $5x + 10 - 10 = 30 + 10$ Justification: _____
		   $5x = 20$
		Step 3: $\frac{5x}{5} = \frac{20}{5}$ Justification: _____
		   $x = 4$
			Day 1
			Teacher paced guided notes where students write down the operations performed on the desired variable to solve for, then reverse those operations. Students will also translate verbal phrases into mathematical equations and then solve them. Corresponding student independent work.
			• eMATH Guided Notes and Student Practice
			
			• Day 1 Notes Video
			
			Day 2
			Teacher paced guided notes where students provide justifications to steps required in solving equations.
				See above.

SLO – WALT We are learning to/that	Student Strategies	Formative Assessment	Activities and Resources	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
			Corresponding student independent work. • eMATH Guided Notes and Student Practice • Day 2 Notes Video	
A.REI.B.3. - WALT solve linear equations in one variable (1 day)	• Identify the operations performed on desired variable to solve for • Identify the operations needed to reverse the operations performed on the desired variable • Reference the word wall.	Exit Ticket Name:_____ Score: ___/___ Unit #2 – Lesson #3 Exit Ticket. Solve the equation below and place the answer in the answer box. Show all steps in your solution. $4(x-3)+2x-3(x+5)$ Answer:	Teacher paced guided notes where students use inverse operations to solve equations. Students will also begin to solve linear equations with variables on each side. Corresponding student independent work. • eMATH Guided Notes and Student Practice • Notes Video	See above.
A.CED.A.4. - WALT rearrange formulas to isolate a variable of interest, using the same reasoning as in solving equations (1 day)	• Identify the operations performed on desired variable to solve for • Identify the operations needed to reverse the operations performed on the desired variable • Consider formulas that would require rearranging to isolate variables of interest, such as perimeter formula.	Exit Ticket Unit #2 – Lesson #7 Exit Ticket: Solve the equation shown below for the variable x. Place your answer in the answer box. $\frac{x}{b}-2=c$ Answer:	Teacher paced guided notes where students compare solving linear equations to literal equations. Students will solve literal equations for desired variables. Corresponding student independent work. • eMATH Guided Notes and Student Practice • Notes Video	See above.

SLO – WALT We are learning to/that	Student Strategies	Formative Assessment	Activities and Resources	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
	• Reference the word wall.			
A.CED.A.1. - WALT create linear inequalities in one variable to model a problem or situation **A.REI.B.3. - WALT** solve linear inequalities in one variable (3 days)	• Identify the operations performed on desired variable to solve for • Identify the operations needed to reverse the operations performed on the desired variable • Compare equations to inequalities • Create models of inequalities on number lines • Recall properties used to justify solving equations • Reference the word wall.	Exit Ticket - Day 1 Unit #2 – Lesson #9 Exit Ticket: Solve the inequality below and graph its solution set on the number line provided. $-4x + 7 < 15$ Exit Ticket - Day 2 Unit #2 – Lesson #10 Exit Ticket: Is $x = 12$ a solution to the compound inequality below? Explain. $x > 5$ and $x \leq 9$ Exit Ticket - Day 3 Unit #2 – Lesson #11 Exit Ticket: Solve the compound inequality below and graph its solution set on the number line provided. $-3x \leq 6$ and $2x + 3 < 17$	**Day 1** Teacher paced guided notes where students identify the properties of inequalities to then solve the inequalities. The students will also model the solution to the inequality on a number line. Corresponding student independent work. • eMATH Guided Notes and Student Practice • Day 1 Notes Video **Day 2** Teacher paced guided notes where students identify the truth values of compound inequalities. The students will also begin to solve compound inequalities and model the solutions on a number line. Corresponding student independent work. • eMATH Guided Notes and Student Practice • Day 2 Notes Video	See above.

SLO – WALT We are learning to/that	Student Strategies	Formative Assessment	Activities and Resources	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
			Day 3 Teacher paced guided notes where students model solutions to compound inequalities on a number line. Students will rewrite 'AND' compound inequalities into a single inequality and vice versa. The students will also be able to identify the number of solutions to compound inequalities. Corresponding student independent work. • eMATH Guided Notes and Student Practice • Day 3 Notes Video	
N.Q.A.1. - WALT use units as a way to understand problems and to guide the solution of multi-step problems **N.Q.A.1. - WALT** interpret units consistently in formulas (1 day)	• Identify the conversions needed to convert different units. • Use a yardstick to identify that there is 3 feet in a yard, 36 inches in a yard, 12 inches in a foot, etc. • Reference the word wall.	Exit Ticket Unit #4 – Lesson #2 Exit Ticket: Summer has her height measured using a metric ruler as 1.6 meters. She would like to know her height in inches. She knows that there are 100 centimeters in a meter and 2.54 centimeters in an inch. Use these facts to find Summer's height to the nearest inch. Show the work that leads to your answer. Answer: [ ]	Teacher paced guided notes where students practice converting units to find the solution to multi step problems. Corresponding student independent work. • eMATH Guided Notes and Student Practice • Notes Video	See above.

SLO – WALT We are learning to/that	Student Strategies	Formative Assessment	Activities and Resources	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
N.RN.B.3. - WALT explain why the sum and product of two rational numbers is rational **N.RN.B.3. - WALT** explain that the sum of a rational number and irrational number is irrational **N.RN.B.3 - WALT** explain that the product of a nonzero rational number and irrational number is irrational (1 day)	• Identify the difference between rational and irrational numbers. • Utilize a calculator to find the decimal approximation of irrational numbers • Reference the word wall.	Exit Ticket Unit #9 – Lesson #2 Exit Ticket: Given the expression $\sqrt{7} + \frac{5}{4}$ do the following: (a) Of the two numbers in the sum, which is rational and which is irrational? (b) Is the sum itself rational or irrational? Explain. Rational: _____ Irrational: _____	Teacher paced guided notes where students write out representations of rational and irrational numbers. Students will also investigate multiplying/adding rational and irrational numbers together to determine if the solution is rational/irrational. Corresponding student independent work. • eMATH Guided Notes and Student Practice • Notes Video	See above.
N.Q.A.3. - WALT choose an appropriate level of accuracy based on the limitations on measurement (1 day)	• Students will calculate the area of a rectangular floor with decimal side lengths and determine why it does not make sense to leave the answer as a decimal approximation. • Reference the word wall.	Exit Ticket Unit #11 – Lesson #8 Exit Ticket: Marissa weighs a piece of quartz on a scale and finds that it weighs 8.4 grams. She looks up the density of quartz online and finds that it is 2.648 grams per cubic centimeter. What is the volume of the rock that Marissa weighed in cubic centimeters? Round to an appropriate level of precision. Why did you round to the level that you did? Explain.	Teacher paced guided notes where students learn the calculation of an output to a model should be rounded to the level of accuracy of the least accurate input to the model. Students will complete problems that will reinforce that knowledge during the notes. Corresponding student independent work.	See above.

SLO – WALT We are learning to/that	Student Strategies	Formative Assessment	Activities and Resources	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
			• eMATH Guided Notes and Student Practice • Notes Video	

Benchmark Assessment 1

Benchmark Assessment	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
Creating/solving equations/justifying steps in solving equations, compare equations/inequalities, identifying units in context, rearranging literal equations	Listed above.

Benchmark Assessment 2

Benchmark Assessment	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
Creating/solving linear inequalities, using a number line with inequalities, unit conversions, comparing rational/irrational numbers, rounding decimals based on the context of the problem.	Listed above.

Summative Assessments (add rows as needed)

Summative Assessment	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
Creating/solving equations/justifying steps in solving equations, compare equations/inequalities, identifying units in context, rearranging literal equations, creating/solving linear inequalities, using a number line with inequalities, unit conversions, comparing rational/irrational numbers, rounding decimals based on the context of the problem.	Listed above.

Interdisciplinary Connections

Interdisciplinary Connections	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
Students can create linear inequalities based off of the town's minimum wage to determine how many hours they would need to work to earn at least enough money to pay for a new phone.	Listed above.

Unit 1B

Unit Title: Algebra 1 – Modeling with Linear Equations and Inequalities – Unit 1 – Module B	
Grade level: 9	**Timeframe: 7 days**

Guiding Questions

1) What are the building blocks of Algebra 1?
2) What are the different types of solutions to systems of equations and inequalities?
3) What is a system of equations or inequalities?

Standards

Standards (Taught and Assessed):

■ **A.CED.A.2** Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.

□ **N.Q.A.1** Use units as a way to understand problems and to guide the solution of multi-step problems; Choose and interpret units consistently in formulas; Choose and interpret the scale and the origin in graphs and data displays.

■ **A.REI.D.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.CED.A.3** Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context. *For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.*

■ **A.REI.D.12** Graph the solutions to a linear inequality in two variables as a half plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes.

Key: ■ Major Cluster □ Supporting Cluster ◎ Additional Cluster

Highlighted Career Ready Practices and 21st Century Themes/Skills

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.

CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.

CRP9. Model integrity, ethical leadership and effective management.

CRP11. Use technology to enhance productivity.

Career Awareness, Exploration, and Preparation Content Area: 21st Century Life and Careers Strand C: Career Preparation

9.2.8.B.3 Evaluate communication, collaboration, and leadership skills that can be developed through school, home, work, and extracurricular activities for use in a career.

9.2.8.B.4 Evaluate how traditional and nontraditional careers have evolved regionally, nationally, and globally.

9.2.8.B.5 Analyze labor market trends using state and federal labor market information and other resources available online.

9.2.8.B.7 Evaluate the impact of online activities and social media on employer decisions.

Career & Technical Education Content Area: 21st Century Life and Careers Standards

9.3.ST.2 Use technology to acquire, manipulate, analyze and report data.

9.3.ST-SM.4 Apply critical thinking skills to review information, explain statistical analysis, and to translate, interpret and summarize research and statistical data.

9.3.ST-SM.3 Analyze the impact that science and mathematics has on society.

Social-Emotional Learning Competencies

New Jersey Social and Emotional Learning Competencies and Sub-Competencies

Self-Awareness

- Recognize one's feelings and thoughts
- Recognize the impact of one's feelings and thoughts on one's own behavior
- Recognize one's personal traits, strengths, and limitations
- Recognize the importance of self-confidence in handling daily tasks and challenges

Self-Management

- Understand and practice strategies for managing one's own emotions, thoughts, and behaviors
- Recognize the skills needed to establish and achieve personal and educational goals
- Identify and apply ways to persevere or overcome barriers through alternative methods to achieve one's goals

Social Awareness

- Recognize and identify the thoughts, feelings, and perspectives of others
- Demonstrate an awareness of the differences among individuals, groups, and others' cultural backgrounds
- Demonstrate an understanding of the need for mutual respect when viewpoints differ
- Demonstrate an awareness of the expectations for social interactions in a variety of settings

Responsible Decision-Making

- Develop, implement, and model effective problem-solving and critical thinking skills
- Identify the consequences associated with one's actions in order to make constructive choices
- Evaluate personal, ethical, safety, and civic impact of decisions

Relationship Skills

- Establish and maintain healthy relationships
- Utilize positive communication and social skills to interact effectively with others
- Identify ways to resist inappropriate social pressure
- Demonstrate the ability to prevent and resolve interpersonal conflicts in constructive ways
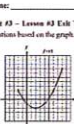- Identify who, when, where, or how to seek help for oneself or others when needed

*Adopted by the New Jersey State Board of Education in August 2017

CAR_Algebra 1-Unit 1-Module B   august.2019

Instructional Plan

Pre-Assessment and Reflection

Pre-Assessment	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
Teacher-created assessment on solving linear equations, plotting coordinates on a four quadrant grid, calculating slope of a line.	Listed below.

Student Learning Objectives (SLO), Strategies, Formative Assessment, Activities and Resources (add rows as needed)

SLO – WALT We are learning to/that	Student Strategies	Formative Assessment	Activities and Resources	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
A.CED.A.2. - WALT create linear equations to represent relationships between two or more quantities **A.CED.A.2. - WALT** graph linear equations on the coordinate plane to represent relationships (2 days)	• Substitute values of x into functions to determine outputs. • Identify the key words for math operations, such as increasing and decreasing. • Identify the specific coordinates that correspond with the four quadrants on a coordinate plane. • Reference the word wall.	Exit Ticket - Day 1 A function rule takes an input, n, and converts it into an output, y, by increasing one half of the input by 20. Determine the output for this rule when the input is 60 and then write an equation for the rule. Exit Ticket - Day 2 Name:_____ Score:___/___ Unit #3 – Lesson #3 Exit Ticket: The function $y = f(x)$ is shown graphed below. Answer the following questions based on the graph. (a) What is the value of $f(6)$? Answer:____ (b) State the maximum value of the function. Answer:____	**Day 1** Teacher paced guided notes where students become familiar with the definition of a function and how to translate verbal descriptions into equations. Students will then have to create equations on their own from verbal descriptions. Corresponding student independent work. • eMATH Guided Notes and Student Practice • Day 1 Notes Video **Day 2** Teacher paced guided notes where students identify inputs and outputs on graphs of	**ELL** • Read written instructions • Students may be provided with note organizers/study guides to reinforce key topics. • Model and provide examples • Extended time on assessments when needed. • Establish a non-verbal cue to redirect students when not on task.

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SLO – WALT We are learning to/that	Student Strategies	Formative Assessment	Activities and Resources	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
			functions. Then students algebraically find inputs/outputs of functions to graph them. Corresponding student independent work. • eMATH Guided Notes and Student Practice • Day 2 Notes Video	• Students may use a bilingual dictionary. • Pair Visual Prompts with Verbal Presentations • Highlight Key Words & Formulas **SPED/504** • Students may be provided with note organizers / study guides to reinforce key topics. • Extended time on assessments when needed. • Preferred seating to be determined by student and teacher. • Provide modified assessments when necessary. • Students may complete assessments in

SLO – WALT We are learning to/that	Student Strategies	Formative Assessment	Activities and Resources	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
				alternate settings when requested. • Establish a non-verbal cue to redirect students when not on task. • Maintain strong teacher / parent communication. • Repetition and practice • Pair Visual Prompts with Verbal Presentations • Provide Formulas • Check Use of Agenda **Gifted & Talented** • Use of Higher Level Questioning Techniques • Extension/Challenge Questions • Provide Assessments at a Higher Level of Thinking

SLO – WALT We are learning to/that	Student Strategies	Formative Assessment	Activities and Resources	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
				• Desmos Linear Activities - https://teacher.desmos.com/linear **At Risk** • Student contracts • Consistent communication with parents and counseling team.
N.Q.A.1. - WALT choose and interpret the scale and the origin in graphs	SMP3- Construct viable arguments and critique the reasoning of others MP4 - Model with mathematics.	**Exit Ticket** The formula d = 1/2n + 26 relates the nozzle pressure n (in pounds per square inch) of a fire hose and the maximum horizontal distance the water reaches d (in feet). How much pressure is needed to reach a fire 50 feet away?	eMATH Guided Notes and Student Practice eMATH Notes Video	See above.
A.REI.D.10. - WALT understand that the graph of an equation, in two variables, is the set of all solutions, often forming a curve	SMP2 - Reason abstractly and quantitatively. SMP5 - Use appropriate tools strategically SMP6 - Attend to precision.	**Exit Ticket** You are planning an awards banquet for your school. You need to rent tables to seat 180 people. Tables come in two sizes. Small tables seat 6 people, and large tables seat 10 people. The equation $6x + 10y = 180$ models this situation, where x is the number of small tables and y is the number of large tables.	Teacher paced guided notes where students will check solutions to systems of equations by substituting values in for x and y in equations. Corresponding student independent work. • eMATH Guided Notes and Student Practice • Notes Video	See above.

SLO – WALT We are learning to/that	Student Strategies	Formative Assessment	Activities and Resources	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
		Graph the equation. Interpret the intercepts, b. Find four possible solutions in the context of the problem.		
A.CED.A.3. - WALT constraints reflect conditions in the modeling process **A.CED.A.3. - WALT** represent a constraint as an equation or inequality **A.CED.A.3. - WALT** interpret possible solutions as viable or nonviable in the modeling context (2 days)	SMP2 - Reason abstractly and quantitatively. SMP3 - Construct viable arguments and critique the reasoning of others. SMP4 - Model with mathematics. SMP5 - Use appropriate tools strategically	A roofing contractor buys 30 bundles of shingles and 4 rolls of roofing paper for $1040. In a 2nd purchase, the contractor buys 8 bundles of shingles for $256. Find the price per bundle of shingles and the price per roll of roofing paper.	Day 1 eMATH Guided Notes and Student Practice Notes Video Day 2 eMATH Guided Notes and Student Practice Notes Video	See above.
A.REI.D.12. – WALT graph the solution of a linear inequality in two variables as a half plane	SMP5 - Use appropriate tools strategically. SMP6 - Attend to precision	Graph the system of linear inequalities. $y \geq 3$ $y > x + 2$	eMATH Guided Notes and Student Practice Notes Video	See above.

Benchmark Assessment 1

Benchmark Assessment	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
Translating phrases into expressions/equations, function notation, graphing functions, converting units based off of the needs of a problem	Listed above.

Benchmark Assessment 2

Benchmark Assessment	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
Identifying constraints in real world situations, solving systems of equations by substituting values in for x and y, creating and solving linear modeling problems, solving systems of linear inequalities	Listed above.

Summative Assessments (add rows as needed)

Summative Assessment	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
Translating phrases into expressions/equations, function notation, graphing functions, converting units based off of the needs of a problem, identifying constraints in real world situations, solving systems of equations by substituting values in for x and y, creating and solving linear modeling problems, solving systems of linear inequalities	Listed above.

Interdisciplinary Connections

Interdisciplinary Connections	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
Students can create a business of their choosing and create linear equations to represent their profit margins. Students will have to identify constraints on their variables, such as quantity of each purchase, monthly charges, etc.	Listed above.

Unit 1C

Unit Title: Algebra 1 – Modeling with Linear Equations and Inequalities – Unit 1 - Module C	
Grade level: 9	**Timeframe: 7 days**

Guiding Questions

1) What do the solutions to systems of equations and inequalities look like when graphed?
2) What do the solutions to systems of equations and inequalities look like when solved algebraically?
3) What are the different types of solutions to systems of equations and inequalities?

Standards

Standards (Taught and Assessed):

■ **A.CED.A.3** Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context. *For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.*

○ **A.REI.C.6** Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.

○ **A.REI.C.5** Prove that, given a system of two equations in two variables, replacing one equation by the sum of that equation and a multiple of the other produces a system with the same solutions.

■ **A.REI.D.12** Graph the solutions to a linear inequality in two variables as a half plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes.

Key: ■ Major Cluster   □ Supporting Cluster   ◎ Additional Cluster

Highlighted Career Ready Practices and 21st Century Themes/Skills

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.

CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.

CRP9. Model integrity, ethical leadership and effective management.

CRP11. Use technology to enhance productivity.

Career Awareness, Exploration, and Preparation Content Area: 21st Century Life and Careers Strand C: Career Preparation

9.2.8.B.3 Evaluate communication, collaboration, and leadership skills that can be developed through school, home, work, and extracurricular activities for use in a career.

9.2.8.B.4 Evaluate how traditional and nontraditional careers have evolved regionally, nationally, and globally.

9.2.8.B.5 Analyze labor market trends using state and federal labor market information and other resources available online.

9.2.8.B.7 Evaluate the impact of online activities and social media on employer decisions.

Career & Technical Education Content Area: 21st Century Life and Careers Standards

9.3.ST.2 Use technology to acquire, manipulate, analyze and report data.

9.3.ST-SM.4 Apply critical thinking skills to review information, explain statistical analysis, and to translate, interpret and summarize research and statistical data.

9.3.ST-SM.3 Analyze the impact that science and mathematics has on society.

New Jersey Social and Emotional Learning Competencies and Sub-Competencies

Self-Awareness

- Recognize one's feelings and thoughts
- Recognize the impact of one's feelings and thoughts on one's own behavior
- Recognize one's personal traits, strengths, and limitations
- Recognize the importance of self-confidence in handling daily tasks and challenges

Self-Management

- Understand and practice strategies for managing one's own emotions, thoughts, and behaviors
- Recognize the skills needed to establish and achieve personal and educational goals
- Identify and apply ways to persevere or overcome barriers through alternative methods to achieve one's goals

Social Awareness

- Recognize and identify the thoughts, feelings, and perspectives of others
- Demonstrate an awareness of the differences among individuals, groups, and others' cultural backgrounds
- Demonstrate an understanding of the need for mutual respect when viewpoints differ
- Demonstrate an awareness of the expectations for social interactions in a variety of settings

Responsible Decision-Making

- Develop, implement, and model effective problem-solving and critical thinking skills
- Identify the consequences associated with one's actions in order to make constructive choices
- Evaluate personal, ethical, safety, and civic impact of decisions

Relationship Skills

- Establish and maintain healthy relationships
- Utilize positive communication and social skills to interact effectively with others
- Identify ways to resist inappropriate social pressure
- Demonstrate the ability to prevent and resolve interpersonal conflicts in constructive ways
- Identify who, when, where, or how to seek help for oneself or others when needed

*Adopted by the New Jersey State Board of Education in August 2017

Instructional Plan

Pre-Assessment and Reflection

Pre-Assessment	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
■ **A.CED.A.3** Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context. *For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.* ○ **A.REI.C.6** Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables. ○ **A.REI.C.5** Prove that, given a system of two equations in two variables, replacing one equation by the sum of that equation and a multiple of the other produces a system with the same solutions. ■ **A.REI.D.12** Graph the solutions to a linear inequality in two variables as a half plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes.	Listed below.

Student Learning Objectives (SLO), Strategies, Formative Assessment, Activities and Resources (add rows as needed)

SLO – WALT We are learning to/that	Student Strategies	Formative Assessment	Activities and Resources	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
A.CED.A.3. - WALT represent constraints by a system of equations in the modeling context	SMP2 - Reason abstractly and quantitatively.	A roofing contractor buys 30 bundles of shingles and 4 rolls of roofing paper for $1040. In a 2nd purchase, the contractor buys 8 bundles of shingles for $256. Find the price per bundle of shingles	[eMATH Guided Notes and Student Practice](#) [Notes Video](#)	**ELL** ● Read written instructions ● Students may be provided with note

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SLO – WALT We are learning to/that	Student Strategies	Formative Assessment	Activities and Resources	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
A.CED.A.3. - WALT interpret possible solutions as viable or nonviable in the modeling context	SMP3 - Construct viable arguments and critique the reasoning of others. SMP4 - Model with mathematics. SMP5 - Use appropriate tools strategically	and the price per roll of roofing paper.		organizers/study guides to reinforce key topics. ● Model and provide examples ● Extended time on assessments when needed. ● Establish a non-verbal cue to redirect students when not on task. ● Students may use a bilingual dictionary. ● Pair Visual Prompts with Verbal Presentations ● Highlight Key Words & Formulas **SPED/504** ● Students may be provided with note organizers / study guides to reinforce key topics.

SLO – WALT We are learning to/that	Student Strategies	Formative Assessment	Activities and Resources	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
				- Extended time on assessments when needed. - Preferred seating to be determined by student and teacher. - Provide modified assessments when necessary. - Students may complete assessments in alternate settings when requested. - Establish a non-verbal cue to redirect students when not on task. - Maintain strong teacher / parent communication. - Repetition and practice - Pair Visual Prompts with Verbal Presentations - Provide Formulas - Check Use of Agenda

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SLO – WALT We are learning to/that	Student Strategies	Formative Assessment	Activities and Resources	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
				Gifted & Talented • Use of Higher Level Questioning Techniques • Extension/Challenge Questions • Provide Assessments at a Higher Level of Thinking • Desmos Linear Activities - https://teacher.desmos.com/linear **At Risk** • Student contracts • Consistent communication with parents and counseling team.
A.REI.C.6. WALT solve a system of linear equations in two variables exactly and approximately	SMP4 - Model with mathematics. SMP6 - Attend to precision. SMP7 - Look for and make use of structure. SMP8 - Look for and express regularity in repeated reasoning.	Solve the system of linear equations by graphing: $y = -2x + 5$ $y = 4x - 1$ Check your answer by solving by substitution.	Day 1 eMATH Guided Notes and Student Practice Notes Video Day 2	See above.

SLO – WALT We are learning to/that	Student Strategies	Formative Assessment	Activities and Resources	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
			eMATH Guided Notes and Student Practice Notes Video	
A.REI.C.5. - WALT transform a system of two equations in two variables into simpler forms that produce a system with the same solutions **A.REI.C.5. - WALT** prove that through elimination. the transformed system will produce the same solution as the original system	SMP1 - Make sense of problems and persevere in solving them. SMP7 - Look for and make use of structure	Solve the system of linear equations by elimination: $x - 3y = 24$ $3x + y = 12$ Check your answer by solving by substitution.	Day 1 eMATH Guided Notes and Student Practice Notes Video Day 2 eMATH Guided Notes and Student Practice Notes Video	See above.
A.REI.D.12. - WALT graph a system of inequalities in two variables **A.REI.D.12 - WALT** graph the solution set to a system of linear inequalities as the intersection of two shaded regions **A.REI.D.12 – WALT** interpret possible solutions	SMP5 - Use appropriate tools strategically. SMP6 - Attend to precision.	Graph the system of linear inequalities: $y \leq 3$ $y > x + 2$	Day 1 eMATH Guided Notes and Student Practice Notes Video Day 2 eMATH Guided Notes and Student Practice Notes Video	See above.

SLO – WALT We are learning to/that	Student Strategies	Formative Assessment	Activities and Resources	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
as viable or nonviable in the modeling context				

Benchmark Assessment 1

Benchmark Assessment	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
Solving systems of equations by graphing, substitution, and elimination, and identifying the different types of solutions	Listed above.

Benchmark Assessment 2

Benchmark Assessment	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
Solving systems of linear inequalities and identifying the different types of solutions	Listed above.

Summative Assessments (add rows as needed)

Summative Assessment	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
Solving systems of equations by graphing, substitution, and elimination, and identifying the different types of solutions, solving systems of linear inequalities and identifying the different types of solutions	Listed above.

Interdisciplinary Connections

Interdisciplinary Connections	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
Students can create a system of linear equations that represent the cost of two different phone plans from stores based in town. They can solve the system of equations to determine which phone plan would be more cost effective for their needs.	Listed above.

Unit 2A

Unit Title: Algebra 1 – Linear and Exponential Modeling: Functions and Bivariate Statistics – Unit 2 - Module A

Grade level: 9

Timeframe: 7 days

Guiding Questions

1) What is the definition of a function?
2) How can you construct a function?
3) What is function notation?

Standards

Standards (Taught and Assessed):

■ **F.IF.B.4** For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.

■ **F.IF.A.1** Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If f is a function and x is an element of its domain, then $f(x)$ denotes the output of f corresponding to the input x. The graph of f is the graph of the equation $y = f(x)$.

■ **F.IF.A.2** Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.

Key: ■ Major Cluster ☐ Supporting Cluster ◎ Additional Cluster

Highlighted Career Ready Practices and 21st Century Themes/Skills

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.

CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.

CRP9. Model integrity, ethical leadership and effective management.

CRP11. Use technology to enhance productivity.

Career Awareness, Exploration, and Preparation Content Area: 21st Century Life and Careers Strand C: Career Preparation

9.2.8.B.3 Evaluate communication, collaboration, and leadership skills that can be developed through school, home, work, and extracurricular activities for use in a career.

9.2.8.B.4 Evaluate how traditional and nontraditional careers have evolved regionally, nationally, and globally.

9.2.8.B.5 Analyze labor market trends using state and federal labor market information and other resources available online.

9.2.8.B.7 Evaluate the impact of online activities and social media on employer decisions.

Career & Technical Education Content Area: 21st Century Life and Careers Standards

9.3.ST.2 Use technology to acquire, manipulate, analyze and report data.

9.3.ST-SM.4 Apply critical thinking skills to review information, explain statistical analysis, and to translate, interpret and summarize research and statistical data.

9.3.ST-SM.3 Analyze the impact that science and mathematics has on society.

New Jersey Social and Emotional Learning Competencies and Sub-Competencies

Self-Awareness

- Recognize one's feelings and thoughts
- Recognize the impact of one's feelings and thoughts on one's own behavior
- Recognize one's personal traits, strengths, and limitations
- Recognize the importance of self-confidence in handling daily tasks and challenges

Self-Management

- Understand and practice strategies for managing one's own emotions, thoughts, and behaviors
- Recognize the skills needed to establish and achieve personal and educational goals
- Identify and apply ways to persevere or overcome barriers through alternative methods to achieve one's goals

Social Awareness

- Recognize and identify the thoughts, feelings, and perspectives of others
- Demonstrate an awareness of the differences among individuals, groups, and others' cultural backgrounds
- Demonstrate an understanding of the need for mutual respect when viewpoints differ
- Demonstrate an awareness of the expectations for social interactions in a variety of settings

Responsible Decision-Making

- Develop, implement, and model effective problem-solving and critical thinking skills
- Identify the consequences associated with one's actions in order to make constructive choices
- Evaluate personal, ethical, safety, and civic impact of decisions

Relationship Skills

- Establish and maintain healthy relationships
- Utilize positive communication and social skills to interact effectively with others
- Identify ways to resist inappropriate social pressure
- Demonstrate the ability to prevent and resolve interpersonal conflicts in constructive ways
- Identify who, when, where, or how to seek help for oneself or others when needed

*Adopted by the New Jersey State Board of Education in August 2017

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Instructional Plan

Pre-Assessment and Reflection

Pre-Assessment	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
Teacher-created assessment on identifying y-intercept of graphs, slopes of linear functions, and graphing linear functions.	Listed below.

Student Learning Objectives (SLO), Strategies, Formative Assessment, Activities and Resources (add rows as needed)

SLO – WALT We are learning to/that	Student Strategies	Formative Assessment	Activities and Resources	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
F.IF.B.4. - WALT the key features of a graph include intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; and end behavior **F.IF.B.4. - WALT** sketch linear and exponential graphs showing key features of a relationship between two quantities given a verbal description of the relationship	SMP2 - Reason abstractly and quantitatively. SMP3 - Construct viable arguments and critique the reasoning of others. SMP5 - Use appropriate tools strategically. SMP7 - Look for and make use of structure.	Day 1 [graph image] Day 2 A linear function g models a relationship in which the dependent variable increases 3 units for every 1 unit the independent variable increases. Graph g when $g(0) = 3$. Identify the slope, y-intercept, and x-intercept of the graph. Day 3	Day 1 eMATH Guided Notes and Student Practice Notes Video Day 2 eMATH Guided Notes and Student Practice Notes Video Day 3 eMATH Guided Notes and Student Practice Notes Video	**ELL** • Read written instructions • Students may be provided with note organizers/study guides to reinforce key topics. • Model and provide examples • Extended time on assessments when needed. • Establish a non-verbal cue to redirect students when not on task.

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SLO – WALT We are learning to/that	Student Strategies	Formative Assessment	Activities and Resources	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
F.IF.B.4. - WALT interpret key features of graphs and tables that model a linear or exponential relationship between two quantities in the context of those quantities		Name: _____ Score: ___ /___ Unit #6 – Lesson #4 Exit Ticket: Consider the exponential function $y = 20(0.75)^x$. One of the two graphs below represents this function. Do the following: (1) circle which graph is correct and (2) mark the value of its y-intercept at the appropriate point. **Day 4** Name: _____ Score: ___ /___ Unit #6 – Lesson #8 Exit Ticket: The table below represents some values of an exponential function. | x	0	1	2	3
y	4	12	36	108 | (a) Explain how you can tell from the table that this is not a linear function. (b) Write the equation of the exponential function in $y = a(b)^x$ form.	Day 4 [eMATH Guided Notes and Student Practice](#) [Notes Video](#)	• Students may use a bilingual dictionary. • Pair Visual Prompts with Verbal Presentations • Highlight Key Words & Formulas **SPED/504** • Students may be provided with note organizers / study guides to reinforce key topics. • Extended time on assessments when needed. • Preferred seating to be determined by student and teacher. • Provide modified assessments when necessary. • Students may complete assessments in

SLO – WALT We are learning to/that	Student Strategies	Formative Assessment	Activities and Resources	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
				alternate settings when requested. • Establish a non-verbal cue to redirect students when not on task. • Maintain strong teacher / parent communication. • Repetition and practice • Pair Visual Prompts with Verbal Presentations • Provide Formulas • Check Use of Agenda **Gifted & Talented** • Use of Higher Level Questioning Techniques • Extension/Challenge Questions • Provide Assessments at a Higher Level of Thinking

SLO – WALT We are learning to/that	Student Strategies	Formative Assessment	Activities and Resources	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
				• Desmos Linear Activities - https://teacher.desmos.com/linear **At Risk** • Student contracts • Consistent communication with parents and counseling team.
F.IF.A.1. - WALT the domain is the set of all possible input values and the range is the set of all possible output values **F.IF.A.1. - WALT** in a function, each element of the domain is assigned to exactly one element in the range **F.IF.A.1. - WALT** $f(x)$ denotes the output for a given input value of x, for a function f **F.IF.A.1. - WALT** the graph of a f is equivalent to the graph of $y = f(x)$	SMP1 - Make sense of problems and persevere in solving them. SMP3 - Construct viable arguments and critique the reasoning of others. SMP6 - Attend to precision. SMP8 - Look for and express regularity in repeated reasoning.	Day 1 Day 2 Day 3	Day 1 eMATH Guided Notes and Student Practice Notes Video Day 2 eMATH Guided Notes and Student Practice Notes Video Day 3 eMATH Guided Notes and Student Practice Notes Video	See above.

SLO – WALT We are learning to/that	Student Strategies	Formative Assessment	Activities and Resources	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
F.IF.A.2. - WALT use function notation to find range values for inputs from a function's domain **F.IF.A.2. - WALT** interpret statements that use function notation in terms of a context				

Benchmark Assessment 1

Benchmark Assessment	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
Identify key features of a graph such as the y and x intercepts, maximums/minimums, increasing/decreasing, compare linear and exponential functions	Listed above.

Benchmark Assessment 2

Benchmark Assessment	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
Identify domain and range of a function, identify functions based off the definition of a function, use function notation for domain and range, interpret statements that use function notation in terms of context	Listed above.

Summative Assessments (add rows as needed)

Summative Assessment	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
Identify key features of a graph such as the y and x intercepts, maximums/minimums, increasing/decreasing, compare linear and exponential functions, identify domain and range of a function, identify functions based off the definition of a function, use function notation for domain and range, interpret statements that use function notation in terms of context.	Listed above.

Interdisciplinary Connections

Interdisciplinary Connections	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
Students can create an exponential model and linear model that represents the growing population in Union for the past 50 years. They can then determine which model is a better representation of the growing population of their town.	Listed above.

Unit 2B

Unit Title: Algebra 1 – Linear and Exponential Modeling: Functions and Bivariate Statistics – Unit 2 - Module B

Grade level: 9   **Timeframe: 12 days**

Guiding Questions

1) How can you represent the domain and range of a function?
2) What is the average rate of change of a function?
3) How can you find the average rate of change of a function?
4) What is the difference between linear and exponential functions?

Standards

Standards (Taught and Assessed):

- **F.IF.B.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.*★

- **F.IF.B 6** Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.

- **F.IF.C.9** Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). *For example, given a graph of one quadratic function and an algebraic expression for another, say which has the larger maximum.*

- **F.BF.B.3** Identify the effect on the graph of replacing $f(x)$ by $f(x) + k$, $k f(x)$, $f(kx)$, and $f(x + k)$ for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them.

- **F.LE.A.1** Distinguish between situations that can be modeled with linear functions and with exponential functions.
   a. Prove that linear functions grow by equal differences over equal intervals, and that exponential functions grow by equal factors over equal intervals.
   b. Recognize situations in which one quantity changes at a constant rate per unit interval relative to another.
   c. Recognize situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another.

☐ **F.LE.A.3** Observe using graphs and tables that a quantity increasing exponentially eventually exceeds a quantity increasing linearly, quadratically, or (more generally) as a polynomial function.

☐ **F.IF.C.7.** Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases★

e. Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude.

Key: ■ Major Cluster   ☐ Supporting Cluster   ◎ Additional Cluster

Highlighted Career Ready Practices and 21st Century Themes/Skills

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.

CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.

CRP9. Model integrity, ethical leadership and effective management.

CRP11. Use technology to enhance productivity.

Career Awareness, Exploration, and Preparation Content Area: 21st Century Life and Careers Strand C: Career Preparation

9.2.8.B.3 Evaluate communication, collaboration, and leadership skills that can be developed through school, home, work, and extracurricular activities for use in a career.

9.2.8.B.4 Evaluate how traditional and nontraditional careers have evolved regionally, nationally, and globally.

9.2.8.B.5 Analyze labor market trends using state and federal labor market information and other resources available online.

9.2.8.B.7 Evaluate the impact of online activities and social media on employer decisions.

Career & Technical Education Content Area: 21st Century Life and Careers Standards

9.3.ST.2 Use technology to acquire, manipulate, analyze and report data.

9.3.ST-SM.4 Apply critical thinking skills to review information, explain statistical analysis, and to translate, interpret and summarize research and statistical data.

9.3.ST-SM.3 Analyze the impact that science and mathematics has on society.

New Jersey Social and Emotional Learning Competencies and Sub-Competencies

Self-Awareness

- Recognize one's feelings and thoughts
- Recognize the impact of one's feelings and thoughts on one's own behavior
- Recognize one's personal traits, strengths, and limitations
- Recognize the importance of self-confidence in handling daily tasks and challenges

Self-Management

- Understand and practice strategies for managing one's own emotions, thoughts, and behaviors
- Recognize the skills needed to establish and achieve personal and educational goals
- Identify and apply ways to persevere or overcome barriers through alternative methods to achieve one's goals

Social Awareness

- Recognize and identify the thoughts, feelings, and perspectives of others
- Demonstrate an awareness of the differences among individuals, groups, and others' cultural backgrounds
- Demonstrate an understanding of the need for mutual respect when viewpoints differ
- Demonstrate an awareness of the expectations for social interactions in a variety of settings

Responsible Decision-Making

- Develop, implement, and model effective problem-solving and critical thinking skills
- Identify the consequences associated with one's actions in order to make constructive choices
- Evaluate personal, ethical, safety, and civic impact of decisions

Relationship Skills

- Establish and maintain healthy relationships
- Utilize positive communication and social skills to interact effectively with others
- Identify ways to resist inappropriate social pressure
- Demonstrate the ability to prevent and resolve interpersonal conflicts in constructive ways
- Identify who, when, where, or how to seek help for oneself or others when needed

Instructional Plan

Pre-Assessment and Reflection

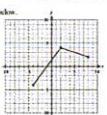| Pre-Assessment	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
Teacher-created assessment on identifying domain and range of a function using function notation, finding slope of linear functions, creating equations representing linear functions.	Listed below.
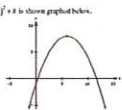
Student Learning Objectives (SLO), Strategies, Formative Assessment, Activities and Resources (add rows as needed)

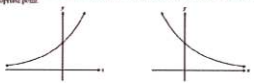| SLO – WALT We are learning to/that	Student Strategies	Formative Assessment	Activities and Resources	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
F.IF.B.5. - WALT relate the domain of a function to its graph **F.IF.B.5. - WALT** relate the domain of a function to the quantitative relationship it describes in the context of the problem or situation	SMP2 - Reason abstractly and quantitatively. SMP3 - Construct viable arguments and critique the reasoning of others. SMP5 - Use appropriate tools strategically. SMP6 - Attend to precision.	Day 1 Name: _____ Score: ____/___ Unit #3 – Lesson #7 Exit Ticket: Given the function $f(x)$ shown below state the following: (a) the domain of $f(x)$ Answer: [ ] (b) the range of $f(x)$ Answer: [ ] Day 2 Name: _____ Score: ____/___ Unit #4 – Lesson #6 Exit Ticket: A baby now (known as a calf) is born with a weight of 62 pounds. The calf gains 2.5 pounds per day in weight. Using this information, write a linear function for the weight of the calf, w, as a function of the days, d, since it was born. Answer: [ ]	Day 1 [eMATH Guided Notes and Student Practice](#) [Notes Video](#) Day 2 [eMATH Guided Notes and Student Practice](#) [Notes Video](#)	**ELL** • Read written instructions • Students may be provided with note organizers/study guides to reinforce key topics. • Model and provide examples • Extended time on assessments when needed. • Establish a non-verbal cue to redirect students when not on task.

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SLO – WALT We are learning to/that	Student Strategies	Formative Assessment	Activities and Resources	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
				- Students may use a bilingual dictionary. - Pair Visual Prompts with Verbal Presentations - Highlight Key Words & Formulas **SPED/504** - Students may be provided with note organizers / study guides to reinforce key topics. - Extended time on assessments when needed. - Preferred seating to be determined by student and teacher. - Provide modified assessments when necessary. - Students may complete assessments in

SLO – WALT We are learning to/that	Student Strategies	Formative Assessment	Activities and Resources	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
				alternate settings when requested. • Establish a non-verbal cue to redirect students when not on task. • Maintain strong teacher / parent communication. • Repetition and practice • Pair Visual Prompts with Verbal Presentations • Provide Formulas • Check Use of Agenda **Gifted & Talented** • Use of Higher Level Questioning Techniques • Extension/Challenge Questions • Provide Assessments at a Higher Level of Thinking

SLO – WALT We are learning to/that	Student Strategies	Formative Assessment	Activities and Resources	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
				• Desmos Linear Activities - https://teacher.desmos.com/linear **At Risk** • Student contracts • Consistent communication with parents and counseling team.
F.IF.B.6. - WALT calculate the average rate of change of linear and exponential functions, presented as a table, over a specified interval and interpret it in the context of the problem **F.IF.B.6. - WALT** estimate the average rate of change of linear and exponential functions from a graph and interpret it in the context of the problem **F.IF.B.6. - WALT** calculate the average rate of change of linear and exponential function, presented symbolically, over a specified interval and	SMP7 - Look for and make use of structure. SMP8 - Look for and express regularity in repeated reasoning.	Day 1 Day 2 Day 3 	Day 1 eMATH Guided Notes and Student Practice Notes Video Day 2 eMATH Guided Notes and Student Practice Notes Video Day 3 eMATH Guided Notes and Student Practice Notes Video	See above.

SLO – WALT We are learning to/that	Student Strategies	Formative Assessment	Activities and Resources	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
interpret it in the context of the problem				
F.IF.C.9. - WALT compare properties of two exponential functions each represented in different ways (numerically, graphically, algebraically, or verbally)	SMP2 - Reason abstractly and quantitatively.	Name: ___ Score: ___ / ___ Unit #8 – Lesson #4 Exit Ticket: A baby cow, known as a calf, was born with a weight of 62 pounds. After one month, its weight had risen to 107 pounds. Based only on the information given, write both a linear model and an exponential model for the weight of the calf, w, as a function of the number of months, m, since it was born. Round the base of your exponential model to the nearest hundredth. Linear Model Exponential Model	eMATH Guided Notes and Student Practice Notes Video	See above.
F.BF.B.3. - WALT identify the effect on the graph of linear and exponential functions by replacing $f(x)$ by $f(x) + k$, $kf(x)$, $f(kx)$, and $f(x + k)$ for specific values of k, and illustrate an explanation of the effects on the graph using technology **F.BF.B.3. - WALT** identify the effect on the graph of linear and exponential functions by replacing $f(x)$ by $kf(x)$ and $f(kx)$ for specific values of k, and illustrate an explanation of the effects on the graph using technology	SMP1 - Make sense of problems and persevere in solving them. SMP2 - Reason abstractly and quantitatively. SMP5 - Use appropriate tools strategically.	Day 1 Name: ___ Score: ___ / ___ Unit #8 – Lesson #3 Exit Ticket: The quadratic function $y = -\frac{1}{4}(x-4)^2 + 8$ is shown graphed below. What are the coordinates of the function's turning point? State below and label on the graph. Day 2 Name: ___ Score: ___ / ___ Unit #11 – Lesson #1 Exit Ticket: The function $f(x)$ is shown graphed below. Another function, g, is defined by $g(x) = -2f(x)$. (a) What is the value of $g(2)$? Show how you found your answer. (b) Produce a graph of $g(x)$ on the same grid.	Day 1 eMATH Guided Notes and Student Practice Notes Video Day 2 eMATH Guided Notes and Student Practice Notes Video	See above.

CAR_Algebra 1-Unit 2-Module B august.2019

SLO – WALT We are learning to/that	Student Strategies	Formative Assessment	Activities and Resources	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
F.BF.B.3. - WALT find the value of *k* given graphs of linear and exponential functions **F.BF.B.3. - WALT** experiment with all cases, $f(x) + k$, $f(x + k)$, $kf(x)$ and $f(kx)$, and illustrate an explanation of the effects on the graph using technology **F.BF.B.3. - WALT** recognize even and odd functions from their graphs and algebraic expressions for them				
F.LEA.1B - WALT recognize situations in which one quantity changes at a constant rate per unit interval relative to one another (linear relationships)	SMP7 - Look for and make use of structure. SMP8 - Look for and express regularity in repeated reasoning.	Name: _____ Score: ___/___ Unit #11 – Lesson #4 Exit Ticket: A baby cow, known as a calf, was born with a weight of 62 pounds. After one month, its weight had risen to 107 pounds. Based only on the information given, write both a linear model and an exponential model for the weight of the calf, w, as a function of the number of months, m, since it was born. Round the base of your exponential model to the nearest hundredth. Linear Model Exponential Model	eMATH Guided Notes and Student Practice Notes Video	See above.
F.LE.A.1. - WALT recognize situations in which a quantity grows or decays by a constant	SMP1 - Make sense of problems and persevere in solving them. SMP2 - Reason abstractly and quantitatively.	Exit Ticket Day 1	eMATH Guided Notes and Student Practice Day 1 Notes Video	See above.

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SLO – WALT We are learning to/that	Student Strategies	Formative Assessment	Activities and Resources	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
percent (exponential relationships) **F.LE.A.1. - WALT** distinguish between situations that can be modeled with linear functions and with exponential functions **F.LE.A.1. - WALT** prove that a function is linear by showing that the first differences are equal **F.LE.A.1. - WALT** prove that a function is exponential by showing that the function grows by equal factors over equal intervals **F.LE.A.3. - WALT** use a graph and a table to observe that a quantity that increases exponentially eventually exceeds a quantity that increases linearly	SMP4 - Model with Mathematics. SMP6 - Attend to precision.	 Exit Ticket Day 2 	[eMATH Guided Notes and Student Practice](#) [Day 2 Notes Video](#)	

SLO – WALT We are learning to/that	Student Strategies	Formative Assessment	Activities and Resources	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
F.IF.C.7. - WALT graph exponential functions, showing intercepts and end behavior of the graph	SMP3 - Construct viable arguments and critique the reasoning of others. SMP6 - Attend to precision.	Exit Ticket Name: _____ Score: ____/____ Unit #6 – Lesson #4 Exit Ticket: Consider the exponential function $y = 26(0.75)^x$. One of the two graphs below represents this function. Do the following: (1) circle which graph is correct and (2) mark the value of its y-intercept at the appropriate point.	[eMATH Guided Notes and Student Practice](#) [Notes Video](#)	See above.

Benchmark Assessment 1

Benchmark Assessment	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
Relate domain and range of a function to the graph of the function, calculate average rate of change over a specific interval for a linear and exponential function, compare multiple exponential functions numerically, graphically, and algebraically	Listed above.

Benchmark Assessment 2

Benchmark Assessment	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
Identify the effects on graphs of linear and exponential functions when values are added/subtracted to the function and multiplying the function, identify the value of k given on graphs of linear and exponential functions, identify odd and even functions, identify situations when a quantity increases at a constant rate (linear functions), identify when a quantity increases or decays by a constant (exponential functions), determine when to use linear and exponential functions when modeling, prove functions are linear or exponential, use a table to identify linear or exponential functions, graph exponential functions	Listed above.

Summative Assessments (add rows as needed)

Summative Assessment	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
Relate domain and range of a function to the graph of the function, calculate average rate of change over a specific interval for a linear and exponential function, compare multiple exponential functions numerically, graphically, and algebraically, identify the effects on graphs of linear and exponential functions when values are added/subtracted to the function and multiplying the function, identify the value of k given on graphs of linear and exponential functions, identify odd and even functions, identify situations when a quantity increases at a constant rate (linear functions), identify when a quantity increases or decays by a constant (exponential functions), determine when to use linear and exponential functions when modeling, prove functions are linear or exponential, use a table to identify linear or exponential functions, graph exponential functions	Listed above.

Interdisciplinary Connections

Interdisciplinary Connections	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
Students can create a table that represents the population increase of the freshmen classes at Union High school. The domain would be each class graduating year and the range would be the student population. They would then determine whether it is best represented by a linear or exponential function.	Listed above.

Unit 2C

Unit Title: Algebra 1 – Linear and Exponential Modeling: Functions and Bivariate Statistics – Unit 2 - Module C

Grade level: 9   **Timeframe: 6 days**

Guiding Questions

1) What is the difference between correlation and causation?
2) How can you fit a linear function for a scatter plot?
3) What technology can help fit a linear function for a scatter plot?

Standards

Standards (Taught and Assessed):

☐ **S.ID.B.6** Represent data on two quantitative variables on a scatter plot and describe how the variables are related.
    a. Fit a function to the data (including with the use of technology); 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 and exponential models.
    b. Informally assess the fit of a function by plotting and analyzing residuals, including with the use of technology.
    c. Fit a linear function for a scatter plot that suggests a linear association.
■ **S.ID.C.7** Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.
■ **S.ID.C.8** Compute (using technology) and interpret the correlation coefficient of a linear fit.
■ **S.ID.C.9** Distinguish between correlation and causation.

Key: ■ Major Cluster   ☐ Supporting Cluster   ◎ Additional Cluster

Highlighted Career Ready Practices and 21st Century Themes/Skills

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.

CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.

CRP9. Model integrity, ethical leadership and effective management.

CRP11. Use technology to enhance productivity.

Career Awareness, Exploration, and Preparation Content Area: 21st Century Life and Careers Strand C: Career Preparation

9.2.8.B.3 Evaluate communication, collaboration, and leadership skills that can be developed through school, home, work, and extracurricular activities for use in a career.

9.2.8.B.4 Evaluate how traditional and nontraditional careers have evolved regionally, nationally, and globally.

9.2.8.B.5 Analyze labor market trends using state and federal labor market information and other resources available online.

9.2.8.B.7 Evaluate the impact of online activities and social media on employer decisions.

Career & Technical Education Content Area: 21st Century Life and Careers Standards

9.3.ST.2 Use technology to acquire, manipulate, analyze and report data.

9.3.ST-SM.4 Apply critical thinking skills to review information, explain statistical analysis, and to translate, interpret and summarize research and statistical data.

9.3.ST-SM.3 Analyze the impact that science and mathematics has on society.

New Jersey Social and Emotional Learning Competencies and Sub-Competencies

Self-Awareness

- Recognize one's feelings and thoughts
- Recognize the impact of one's feelings and thoughts on one's own behavior
- Recognize one's personal traits, strengths, and limitations
- Recognize the importance of self-confidence in handling daily tasks and challenges

Self-Management

- Understand and practice strategies for managing one's own emotions, thoughts, and behaviors
- Recognize the skills needed to establish and achieve personal and educational goals
- Identify and apply ways to persevere or overcome barriers through alternative methods to achieve one's goals

Social Awareness

- Recognize and identify the thoughts, feelings, and perspectives of others
- Demonstrate an awareness of the differences among individuals, groups, and others' cultural backgrounds
- Demonstrate an understanding of the need for mutual respect when viewpoints differ
- Demonstrate an awareness of the expectations for social interactions in a variety of settings

Responsible Decision-Making

- Develop, implement, and model effective problem-solving and critical thinking skills
- Identify the consequences associated with one's actions in order to make constructive choices
- Evaluate personal, ethical, safety, and civic impact of decisions

Relationship Skills

- Establish and maintain healthy relationships
- Utilize positive communication and social skills to interact effectively with others
- Identify ways to resist inappropriate social pressure
- Demonstrate the ability to prevent and resolve interpersonal conflicts in constructive ways
- Identify who, when, where, or how to seek help for oneself or others when needed
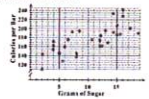
*Adopted by the New Jersey State Board of Education in August 2017

CAR_Algebra 1-Unit 2-Module C august.2019

Instructional Plan

Pre-Assessment and Reflection

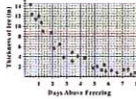| Pre-Assessment	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
Teacher-created assessment on plotting coordinates, determining if a linear function or exponential function better fits data given, identifying average rate of change for linear and exponential functions.	Listed below.

Student Learning Objectives (SLO), Strategies, Formative Assessment, Activities and Resources (add rows as needed)
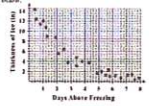
SLO – WALT We are learning to/that	Student Strategies	Formative Assessment	Activities and Resources	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
S.ID.B.6. - WALT represent data on two quantitative variables on a scatter plot **S.ID.B.6. - WALT** describe the relationship between the two sets of quantitative data	SMP3 - Construct viable arguments and critique the reasoning of others. SMP5 - Use appropriate tools strategically.	Exit Ticket Name: _____ Score: ____ / ____ Unit #1B – Lesson #6 Exit Ticket: Study was done to see the correlation between the amount of sugar in nutrition bars and the number of calories they contain. The scatterplot of the data is shown below. (a) Draw a line of best fit on the data. (b) Estimate the y-intercept of the line you drew. (c) Is there a positive or negative correlation between grams of sugar and calories? Explain.	[eMATH Guided Notes and Student Practice](#) [Notes Video](#)	**ELL** - Read written instructions - Students may be provided with note organizers/study guides to reinforce key topics. - Model and provide examples - Extended time on assessments when needed. - Establish a non-verbal cue to redirect students when not on task.

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SLO – WALT We are learning to/that	Student Strategies	Formative Assessment	Activities and Resources	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
				• Students may use a bilingual dictionary. • Pair Visual Prompts with Verbal Presentations • Highlight Key Words & Formulas **SPED/504** • Students may be provided with note organizers / study guides to reinforce key topics. • Extended time on assessments when needed. • Preferred seating to be determined by student and teacher. • Provide modified assessments when necessary. • Students may complete assessments in

SLO – WALT We are learning to/that	Student Strategies	Formative Assessment	Activities and Resources	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
				alternate settings when requested. • Establish a non-verbal cue to redirect students when not on task. • Maintain strong teacher / parent communication. • Repetition and practice • Pair Visual Prompts with Verbal Presentations • Provide Formulas • Check Use of Agenda **Gifted & Talented** • Use of Higher Level Questioning Techniques • Extension/Challenge Questions • Provide Assessments at a Higher Level of Thinking

SLO – WALT We are learning to/that	Student Strategies	Formative Assessment	Activities and Resources	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
				• Desmos Linear Activities - https://teacher.desmos.com/linear **At Risk** • Student contracts • Consistent communication with parents and counseling team.
S.ID.B.6.A - WALT fit linear and exponential functions to data by hand and with the use of technology **S.ID.B.6.A - WALT** use a function fitted to data to solve problems in the context of the data **S.ID.C.9. - WALT** distinguish between correlation and causation	SMP3 - Construct viable arguments and critique the reasoning of others. SMP5 - Use appropriate tools strategically.	Day 1 Exit Ticket Day 2 Exit Ticket 	Day 1 eMATH Guided Notes and Student Practice Notes Video Day 2 eMATH Guided Notes and Student Practice Notes Video	See above.
S.ID.B.6. - WALT use given functions or choose a function suggested by the context.	SMP3 - Construct viable arguments and critique the reasoning of others.	Exit Ticket 	eMATH Guided Notes and Student Practice Notes Video	See above.

SLO – WALT We are learning to/that	Student Strategies	Formative Assessment	Activities and Resources	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
S.ID.B.6. - WALT assess the fit of a function by plotting and analyzing residuals, including with the use of technology	SMP5 - Use appropriate tools strategically.			
S.ID.C.7. - WALT interpret the slope of a linear model as a constant rate of change in context of the data **S.ID.C.7. - WALT** interpret the constant term of a linear model in context of the data	SMP1 - Make sense of problems and persevere in solving them. SMP2 - Reason abstractly and quantitatively. SMP6 - Attend to precision.	Exit Ticket 	eMATH Guided Notes and Student Practice Notes Video	See above.
S.ID.C.8. - WALT compute (using technology) and interpret the correlation coefficient for a linear fit	SMP1 - Make sense of problems and persevere in solving them. SMP2 - Reason abstractly and quantitatively. SMP6 - Attend to precision.	Exit Ticket 	eMATH Guided Notes and Student Practice Notes Video	See above.

Benchmark Assessment 1

Benchmark Assessment	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
Create a line of best fit on a scatter plot algebraically, identify positive or negative correlation, create a line of best fit using a calculator, interpret y-intercepts given the context of a problem, determine if a linear, exponential, or quadratic function best represents a scatter plot.	Listed above.

Benchmark Assessment 2

Benchmark Assessment	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
Determine residual values, determine the best fit for residual plots, interpret the slope of a linear model based on the context of the problem, interpret the constant term in context of a linear model, and use a calculator to determine the correlation coefficient.	Listed above.

Summative Assessments (add rows as needed)

Summative Assessment	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
Create a line of best fit on a scatter plot algebraically, identify positive or negative correlation, create a line of best fit using a calculator, interpret y-intercepts given the context of a problem, determine if a linear, exponential, or quadratic function best represents a scatter plot, Determine residual values, determine the best fit for residual plots, interpret the slope of a linear model based on the context of the problem, interpret the constant term in context of a linear model, and use a calculator to determine the correlation coefficient.	Listed above.

Interdisciplinary Connections

Interdisciplinary Connections	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
Students can create a scatter plot to see the difference daily temperatures in the summer make with ice cream sales. Students can contact Magic Fountain Ice Cream in Union for their ice cream sales for 2 weeks in the month of June and get the daily average temperature for the corresponding days. The students can then create a line of best fit and determine which type of function best represents the data.	Listed above.

Unit Title: Algebra 1 – Linear and Exponential Modeling: Functions and Bivariate Statistics – Unit 2 - Module D

Grade level: 9   **Timeframe: 13 days**

Guiding Questions

1) What are like terms?
2) How can you identify whether expressions are equivalent?
3) What is the definition of a function?
4) How can you construct a function?

Standards

Standards (Taught and Assessed):

■**A.CED.A.1** Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions.

☐**F.BF.A.1** Write a function that describes a relationship between two quantities.

 a. Determine an explicit expression, a recursive process, or steps for calculation from a context.

■**A.SSE.A.1** Interpret expressions that represent a quantity in terms of its context.

 a. Interpret parts of an expression, such as terms, factors, and coefficients.

 b. Interpret complicated expressions by viewing one or more of their parts as a single entity. *For example, interpret $P(1+r)^n$ as the product of P and a factor not depending on P.*

☐**A.SSE.B.3** Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.

 c. Use the properties of exponents to transform expressions for exponential functions. *For example: the expression 1.15^t can be rewritten as $(1.15)^{1/12t}$ to reveal the approximate equivalent monthly interest rate if the annual rate is 15%.*

☐**F.LE.A.2** Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table).

■**F.IF.A.3** Recognize that sequences are functions, sometimes defined recursively, whose domain is a subset of the integers. *For example, the Fibonacci sequence is defined recursively by $f(0) = f(1) = 1, f(n + 1) = f(n) + f(n - 1)$ for $n \geq 1$.*

F.LE.B.5 Interpret the parameters in a linear or exponential function in terms of a context.

Key: ■ Major Cluster ☐ Supporting Cluster ◎ Additional Cluster

Highlighted Career Ready Practices and 21st Century Themes/Skills

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.

CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.

CRP9. Model integrity, ethical leadership and effective management.

CRP11. Use technology to enhance productivity.

Career Awareness, Exploration, and Preparation Content Area: 21st Century Life and Careers Strand C: Career Preparation

9.2.8.B.3 Evaluate communication, collaboration, and leadership skills that can be developed through school, home, work, and extracurricular activities for use in a career.

9.2.8.B.4 Evaluate how traditional and nontraditional careers have evolved regionally, nationally, and globally.

9.2.8.B.5 Analyze labor market trends using state and federal labor market information and other resources available online.

9.2.8.B.7 Evaluate the impact of online activities and social media on employer decisions.

Career & Technical Education Content Area: 21st Century Life and Careers Standards

9.3.ST.2 Use technology to acquire, manipulate, analyze and report data.

9.3.ST-SM.4 Apply critical thinking skills to review information, explain statistical analysis, and to translate, interpret and summarize research and statistical data.

9.3.ST-SM.3 Analyze the impact that science and mathematics has on society.

New Jersey Social and Emotional Learning Competencies and Sub-Competencies

Self-Awareness

- Recognize one's feelings and thoughts
- Recognize the impact of one's feelings and thoughts on one's own behavior
- Recognize one's personal traits, strengths, and limitations
- Recognize the importance of self-confidence in handling daily tasks and challenges

Self-Management

- Understand and practice strategies for managing one's own emotions, thoughts, and behaviors
- Recognize the skills needed to establish and achieve personal and educational goals
- Identify and apply ways to persevere or overcome barriers through alternative methods to achieve one's goals

Social Awareness

- Recognize and identify the thoughts, feelings, and perspectives of others
- Demonstrate an awareness of the differences among individuals, groups, and others' cultural backgrounds
- Demonstrate an understanding of the need for mutual respect when viewpoints differ
- Demonstrate an awareness of the expectations for social interactions in a variety of settings

Responsible Decision-Making

- Develop, implement, and model effective problem-solving and critical thinking skills
- Identify the consequences associated with one's actions in order to make constructive choices
- Evaluate personal, ethical, safety, and civic impact of decisions

Relationship Skills

- Establish and maintain healthy relationships
- Utilize positive communication and social skills to interact effectively with others
- Identify ways to resist inappropriate social pressure
- Demonstrate the ability to prevent and resolve interpersonal conflicts in constructive ways
- Identify who, when, where, or how to seek help for oneself or others when needed

*Adopted by the New Jersey State Board of Education in August 2017

Instructional Plan

Pre-Assessment and Reflection

Pre-Assessment	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
Teacher-created assessment on identifying key features of linear and exponential functions, finding domain and range of functions, using function notation, determining when to use a linear or exponential function.	Listed below.

Student Learning Objectives (SLO), Strategies, Formative Assessment, Activities and Resources (add rows as needed)

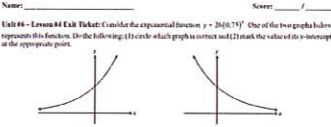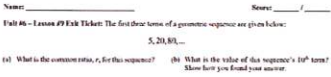| SLO – WALT We are learning to/that	Student Strategies	Formative Assessment	Activities and Resources	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
A.CED.A.1. - WALT create exponential equations and inequalities in one variable to model a problem or situation 2 days	SMP1 - Make sense of problems and persevere in solving them.	Day 1 Exit Ticket *Name:_____ Score:____/____* *Unit #2 – Lesson #13 Exit Ticket: A tour company for large groups charges a one time fee of $200 plus an additional $25 per person who goes on the tour. They must make at least $1,650 to make the tour profitable. Let n be the number of people going on the tour. Write and solve an inequality in terms of n that represents all numbers of people who can go on the tour to make it profitable.* Day 2 Exit Ticket *Name:_____ Score:____/____* *Unit #11 – Lesson #4 Exit Ticket: A baby cow, known as a calf, was born with a weight of 62 pounds. After one month, its weight had risen to 107 pounds. Based only on the information given, write both a linear model and an exponential model for the weight of the calf, w, as a function of the number of months, m, since it was born. Round the base of your exponential model to the nearest hundredth.* *Linear Model: Exponential Model:*	Day 1 [eMATH Guided Notes and Student Practice](#) [Notes Video](#) Day 2 [eMATH Guided Notes and Student Practice](#) [Notes Video](#)	**ELL** - Read written instructions - Students may be provided with note organizers/study guides to reinforce key topics. - Model and provide examples - Extended time on assessments when needed. - Establish a non-verbal cue to

SLO – WALT We are learning to/that	Student Strategies	Formative Assessment	Activities and Resources	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
				redirect students when not on task. • Students may use a bilingual dictionary. • Pair Visual Prompts with Verbal Presentations • Highlight Key Words & Formulas **SPED/504** • Students may be provided with note organizers / study guides to reinforce key topics. • Extended time on assessments when needed. • Preferred seating to be determined by student and teacher. • Provide modified assessments when necessary. • Students may complete

SLO – WALT We are learning to/that	Student Strategies	Formative Assessment	Activities and Resources	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
				assessments in alternate settings when requested. • Establish a non-verbal cue to redirect students when not on task. • Maintain strong teacher / parent communication. • Repetition and practice • Pair Visual Prompts with Verbal Presentations • Provide Formulas • Check Use of Agenda **Gifted & Talented** • Use of Higher Level Questioning Techniques • Extension/Challenge Questions • Provide Assessments at a Higher Level of Thinking

SLO – WALT We are learning to/that	Student Strategies	Formative Assessment	Activities and Resources	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
				• Desmos Linear Activities - https://teacher.desmos.com/linear **At Risk** • Student contracts • Consistent communication with parents and counseling team.
F.BF.A.1. - WALT write a function that describes a linear relationship between two quantities **F.BF.A.1. - WALT** write a function that describes an exponential relationship between two quantities **F.BF.A.1. - WALT** determine an explicit expression for a function that models a linear or exponential relationship between two quantities **F.BF.A.1. - WALT** determine a recursive process for a function that model a linear or	SMP2 - Reason abstractly and quantitatively. SMP3 - Construct viable arguments and critique the reasoning of others.	Day 1 Exit Ticket Name: _____ Lesson #7 Exit Ticket Score: ___/___ Unit #4 – Lesson #7 Exit Ticket: A water tank is draining. The volume of the water in the tank, in gallons, is a linear function of the amount of time it has been draining, in hours. It can be modeled using the equation $F(t) = -12.8t + 653$, where F is the volume and t is the time. Give a physical interpretation, in the context of the problem, for the values −12.8 and 653. Day 2 Exit Ticket Name: _____ Score: ___/___ Unit #11 – Lesson #4 Exit Ticket: A baby cow, known as a calf, was born with a weight of 62 pounds. After one month, its weight had risen to 107 pounds. Based only on the information given, write both a linear model and an exponential model for the weight of the calf, w, as a function of the number of months, m, since it was born. Round the base of your exponential model to the nearest hundredth. Linear Model: Exponential Model Day 3 Exit Ticket Name: _____ Score: ___/___ Unit #6 – Lesson #9 Exit Ticket: The first three terms of a geometric sequence are given below: 5, 20, 80, ... (a) What is the common ratio, r, for this sequence? (b) What is the value of this sequence's 10th term? Show how you found your answer	Day 1 eMATH Guided Notes and Student Practice Notes Video Day 2 eMATH Guided Notes and Student Practice Notes Video Day 3 eMATH Guided Notes and Student Practice Notes Video	See above.

SLO – WALT We are learning to/that	Student Strategies	Formative Assessment	Activities and Resources	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
exponential relationship between two quantities **F.BF.A.1. - WALT** determine a set of steps for calculation for a function that models a linear of exponential relationship between two quantities 3 days				
A.SSE.A.1. - WALT interpret parts of an expression, such as terms, factors, and coefficients, in context **A.SSE.A.1. - WALT** interpret the meaning of a complicated expression by viewing one or more parts as a single quantity	SMP2 - Reason abstractly and quantitatively SMP4 - Model with mathematics.	Exit Ticket Name: _____ Score: ____ / ____ Unit #7 – Lesson #1 Exit Ticket: For the following difference: $7x^2 + 2x + 11 - (3x^2 - 3x + 4)$ (a) Write the expression in simplest form. (b) Give the value of the expression from (a) when $x = 10$.	[eMATH Guided Notes and Student Practice](#) [Notes Video](#)	See above.
A.SSE.B.3. - WALT use the properties of exponents to rewrite exponential expressions that define an exponential function in order to reveal information	SMP3 - Construct viable arguments and critique the reasoning of others SMP4 - Model with mathematics.	Exit Ticket Name: _____ Score: ____ / ____ Unit #6 – Lesson #7 Exit Ticket: The number of bacteria in a lab experiment is increasing by 2.5% per minute. The experiment started with 200 bacteria. (a) Write an exponential function the models the number of bacteria, y, as a function of the time in minutes that it has been growing, x. (b) How many bacteria, to the nearest whole number, does your model predict will be present after one hour of growth?	[eMATH Guided Notes and Student Practice](#) [Notes Video](#)	See above.

SLO – WALT We are learning to/that	Student Strategies	Formative Assessment	Activities and Resources	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
in the context of the problem or situation				
F.LE.A.2. - WALT construct linear functions given a graph, a description of a relationship, or two input-output pairs (include reading these from a table) **F.LE.A.2. - WALT** interpret the parameters (slope and constant term) of a linear function in terms of a context	SMP2 - Reason abstractly and quantitatively. SMP3 - Construct viable arguments and critique the reasoning of others	Exit Ticket Name: _____ Score: ___/___ Unit #6 – Lesson #6 Exit Ticket: A baby sow (known as a calf) is born with a weight of 62 pounds. The calf gains 2.5 pounds per day in weight. Using this information, write a linear function for the weight of the calf, w, as a function of the days, d, since it was born. Answer: [ ]	[eMATH Guided Notes and Student Practice](#) [Notes Video](#)	See above.
F.LE.B.5. - WALT construct exponential functions, including geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table) **F.LE.B.5. - WALT** interpret the parameters (vertical intercept and base) of exponential function in terms of a context	SMP3 - Construct viable arguments and critique the reasoning of others SMP5 - Use appropriate tools strategically.	Day 1 Exit Ticket Name: _____ Score: ___/___ Unit #6 – Lesson #4 Exit Ticket: Consider the exponential function $y = 26(0.75)^x$. One of the two graphs below represents this function. Do the following: (1) circle which graph is correct and (2) mark the value of its y-intercept at the appropriate point. Day 2 Exit Ticket Name: _____ Score: ___/___ Unit #6 – Lesson #9 Exit Ticket: The first three terms of a geometric sequence are given below: 5, 20, 80,... (a) What is the common ratio, r, for this sequence? (b) What is the value of this sequence's 10th term? Show how you found your answer.	Day 1 [eMATH Guided Notes and Student Practice](#) [Notes Video](#) Day 2 [eMATH Guided Notes and Student Practice](#) [Notes Video](#)	See above.

SLO – WALT We are learning to/that	Student Strategies	Formative Assessment	Activities and Resources	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
2 days				
F.IF.A.3. - WALT sequences are functions, sometimes defined recursively, whose domain is a subset of the integers **F.LE.A.2. - WALT** construct arithmetic sequences given a graph, a description of a relationship, or two input-output pairs (include reading these from a table) 2 days	SMP4 - Model with mathematics. SMP5 - Use appropriate tools strategically. SMP6 - Attend to .. prec1s1on. SMP7 - Look for and make use of structure.	Exit Ticket Name: _____ Score: ____ /___ Unit #4 - Lesson #12 Exit Ticket: Given the sequence, a, shown below, answer the following questions. 5, 9, 13, 17, 21, 25, 29 (a) What is the value of a_6? (b) Fill in the blank: $a_n = a_{n-1} +$ _____	[eMATH Guided Notes and Student Practice](#) [Notes Video](#)	See above.
F.LE.A.2. - WALT construct geometric sequences given a graph, a description of a relationship, or two input-output pairs (include reading these from a table)	SMP2 - Reason abstractly and quantitatively SMP3 - Construct viable arguments and critique the reasoning of others	Exit Ticket Name: _____ Score: ____ /___ Unit #6 - Lesson #9 Exit Ticket: The first three terms of a geometric sequence are given below: 5, 20, 80, ... (a) What is the common ratio, r, for this sequence? (b) What is the value of this sequence's 10th term? Show how you found your answer.	[eMATH Guided Notes and Student Practice](#) [Notes Video](#)	See above.

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Benchmark Assessment 1

Benchmark Assessment	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
Creating inequalities that model linear real-world situations, creating linear and exponential models, write a function that describes the linear relationship and exponential relationship between two quantities, explaining the context of two quantities in a linear and exponential relationship, determine a recursive pattern for exponential functions	Listed above.

Benchmark Assessment 2

Benchmark Assessment	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
Interpret parts of an expression, such as constant terms and powers, use properties of exponents to rewrite expressions with exponents, construct linear and exponential functions using a graph, a table, or a description, construct arithmetic and geometric sequences	Listed above.

Summative Assessments (add rows as needed)

Summative Assessment	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
Creating inequalities that model linear real-world situations, creating linear and exponential models, write a function that describes the linear relationship and exponential relationship between two quantities, explaining the context of two quantities in a linear and exponential relationship, determine a recursive pattern for exponential functions, interpret parts of an expression, such as constant terms and powers, use properties of exponents to rewrite expressions with exponents, construct linear and exponential functions using a graph, a table, or a description, construct arithmetic and geometric sequences.	Listed above.

Interdisciplinary Connections

Interdisciplinary Connections	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
Each class of students can find a charity or cause they would like to donate to. They can create a goal of the amount of money they would at least like to donate to the charity. As a class, they can find a fundraiser to help them reach their donation goal. Then, they can create a linear inequality to help them determine what each student in a class needs to sell or do to help them each their goal.	Listed above.

Unit Title: Algebra 1 – Quadratic Modeling – Unit 3 - Module A

Grade level: 9   **Timeframe: 5 days**

Guiding Questions

1) What is a polynomial?
2) How can you find equivalent forms of a polynomial?
3) What is a difference of squares?

Standards

Standards (Taught and Assessed):

■ **A.APR.A.1** Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials.

■ **A.SSE.A.2** Use the structure of an expression to identify ways to rewrite it. *For example, see $x^4 - y^4$ as $(x^2)^2 - (y^2)^2$, thus recognizing it as a difference of squares that can be factored as $(x^2 - y^2)(x^2 + y^2)$.*

□ **A.SSE.B.3** Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.

　　a. Factor a quadratic expression to reveal the zeros of the function it defines.

　　b. Complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines.

Key: ■ Major Cluster   □ Supporting Cluster   ◎ Additional Cluster

Highlighted Career Ready Practices and 21st Century Themes/Skills

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.

CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.

CRP9. Model integrity, ethical leadership and effective management.

CRP11. Use technology to enhance productivity.

Career Awareness, Exploration, and Preparation Content Area: 21st Century Life and Careers Strand C: Career Preparation

9.2.8.B.3 Evaluate communication, collaboration, and leadership skills that can be developed through school, home, work, and extracurricular activities for use in a career.

9.2.8.B.4 Evaluate how traditional and nontraditional careers have evolved regionally, nationally, and globally.

9.2.8.B.5 Analyze labor market trends using state and federal labor market information and other resources available online.

9.2.8.B.7 Evaluate the impact of online activities and social media on employer decisions.

Career & Technical Education Content Area: 21st Century Life and Careers Standards

9.3.ST.2 Use technology to acquire, manipulate, analyze and report data.

9.3.ST-SM.4 Apply critical thinking skills to review information, explain statistical analysis, and to translate, interpret and summarize research and statistical data.

9.3.ST-SM.3 Analyze the impact that science and mathematics has on society.

New Jersey Social and Emotional Learning Competencies and Sub-Competencies

Self-Awareness

- Recognize one's feelings and thoughts
- Recognize the impact of one's feelings and thoughts on one's own behavior
- Recognize one's personal traits, strengths, and limitations
- Recognize the importance of self-confidence in handling daily tasks and challenges

Self-Management

- Understand and practice strategies for managing one's own emotions, thoughts, and behaviors
- Recognize the skills needed to establish and achieve personal and educational goals
- Identify and apply ways to persevere or overcome barriers through alternative methods to achieve one's goals

Social Awareness

- Recognize and identify the thoughts, feelings, and perspectives of others
- Demonstrate an awareness of the differences among individuals, groups, and others' cultural backgrounds
- Demonstrate an understanding of the need for mutual respect when viewpoints differ
- Demonstrate an awareness of the expectations for social interactions in a variety of settings

Responsible Decision-Making

- Develop, implement, and model effective problem-solving and critical thinking skills
- Identify the consequences associated with one's actions in order to make constructive choices
- Evaluate personal, ethical, safety, and civic impact of decisions

Relationship Skills

- Establish and maintain healthy relationships
- Utilize positive communication and social skills to interact effectively with others
- Identify ways to resist inappropriate social pressure
- Demonstrate the ability to prevent and resolve interpersonal conflicts in constructive ways
- Identify who, when, where, or how to seek help for oneself or others when needed

*Adopted by the New Jersey State Board of Education in August 2017

CAR_Algebra 1-Unit 3-Module Aaugust.2019

Instructional Plan

Pre-Assessment and Reflection

Pre-Assessment	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
Teacher-created assessment on identifying parts of an expression, such as coefficients, powers, constant terms, identifying like terms, finding GCF of numbers.	Listed below.

Student Learning Objectives (SLO), Strategies, Formative Assessment, Activities and Resources (add rows as needed)

SLO – WALT We are learning to/that	Student Strategies	Formative Assessment	Activities and Resources	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
A.APR.A.1. - WALT polynomials form a system comparable to the integers **A.APR.A.1. - WALT** the sum, difference, and product of two polynomials is a polynomial **A.APR.A.1. - WALT** add and subtract polynomials **A.APR.A.1. - WALT** multiply polynomials **A.SSE.A.2. - WALT** use the structure of an	SMP1 - Make sense of problems and persevere in solving them. SMP2 - Reason abstractly and quantitatively. SMP6 - Attend to precision. SMP7 - Look for and make use of structure.	Day 1 Exit Ticket *Name:_____ Score:___ /___* *Unit #7 – Lesson #1 Exit Ticket: For the following difference:* $7x^2 + 2x + 11 - (5x^2 - 3x + 4)$ *(a) Write the expression in simplest form.* *(b) Give the value of the expression from (a) when x = 10.* Day 2 Exit Ticket *Name:_____ Score:___ /___* *Unit #7 – Lesson #2 Exit Ticket: Write each of the following products in standard form. Show the work that leads to your final answers.* *(a) $(x+9)(2x-3)$* *(b) $(x-5)^2$*	Day 1 [eMATH Guided Notes and Student Practice](#) [Notes Video](#) Day 2 [eMATH Guided Notes and Student Practice](#) [Notes Video](#)	**ELL** • Read written instructions • Students may be provided with note organizers/study guides to reinforce key topics. • Model and provide examples • Extended time on assessments when needed. • Establish a non-verbal cue to redirect students when not on task.

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SLO – WALT We are learning to/that	Student Strategies	Formative Assessment	Activities and Resources	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
expression to identify ways to rewrite it 2 days				• Students may use a bilingual dictionary. • Pair Visual Prompts with Verbal Presentations • Highlight Key Words & Formulas **SPED/504** • Students may be provided with note organizers / study guides to reinforce key topics. • Extended time on assessments when needed. • Preferred seating to be determined by student and teacher. • Provide modified assessments when necessary. • Students may complete assessments in

SLO – WALT We are learning to/that	Student Strategies	Formative Assessment	Activities and Resources	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
				alternate settings when requested. • Establish a non-verbal cue to redirect students when not on task. • Maintain strong teacher / parent communication. • Repetition and practice • Pair Visual Prompts with Verbal Presentations • Provide Formulas • Check Use of Agenda **Gifted & Talented** • Use of Higher Level Questioning Techniques • Extension/Challenge Questions • Provide Assessments at a Higher Level of Thinking

SLO – WALT We are learning to/that	Student Strategies	Formative Assessment	Activities and Resources	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
				• Desmos Linear Activities - https://teacher.desmos.com/linear **At Risk** • Student contracts • Consistent communication with parents and counseling team.
A.SSE.B.3. - WALT factor a quadratic expression in order to reveal the zeros of the function it defines **A.SSE.B.3. - WALT** complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines 3 days	SMP6 - Attend to precision. SMP7 - Look for and make use of structure.	Day 1 Exit Ticket Day 2 Exit Ticket Day 3 Exit Ticket	Day 1 eMATH Guided Notes and Student Practice Notes Video Day 2 eMATH Guided Notes and Student Practice Notes Video Day 3 eMATH Guided Notes and Student Practice Notes Video	See above.

Benchmark Assessment 1

Benchmark Assessment	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
Add, subtract, and multiply polynomials	Listed above.

Benchmark Assessment 2

Benchmark Assessment	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
Factor polynomials using GCF, completing the square, and factor by grouping, finding the zeros of a polynomial function algebraically, and finding the maximum/minimum values of a polynomial function algebraically	Listed above.

Summative Assessments (add rows as needed)

Summative Assessment	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
Add, subtract, and multiply polynomials, factor polynomials using GCF, completing the square, and factor by grouping, finding the zeros of a polynomial function algebraically, and finding the maximum/minimum values of a polynomial function algebraically	Listed above.

Interdisciplinary Connections

Interdisciplinary Connections	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
Students can take the dimensions of the George Washington Bridge and create a polynomial expression that represents the suspension wires on the bridge. The students can then factor the polynomial to determine the minimum and maximum dimensions on the bridge.	Listed above.

Unit Title: Algebra 1 – Quadratic Modeling – Unit 3 - Module B

Grade level: 9   **Timeframe: 7 days**

Guiding Questions

1) What are the key features of a quadratic graph?
2) What methods can be used to solve quadratic functions?
3) How can you interpret a quadratic function's average rate of change?
4) How can you find the average rate of change from a quadratic function?

Standards

Standards (Taught and Assessed):

■ **F.IF.B.4.** For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.

■ **F.IF.B.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*

■ **F.IF.B.6** Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.

■ **A.REI.B.4** Solve quadratic equations in one variable.

a. Use the method of completing the square to transform any quadratic equation in x into an equation of the form $(x − p)^2 = q$ that has the same solutions. Derive the quadratic formula from this form.

b. Solve quadratic equations by inspection (e.g., for $x^2 = 49$), taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions and write them as $a ± bi$ for real numbers a and b.

■ **A.CED.A.1** Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions.

Key: ■ Major Cluster   ☐ Supporting Cluster   ◉ Additional Cluster

Highlighted Career Ready Practices and 21st Century Themes/Skills

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.

CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.

CRP9. Model integrity, ethical leadership and effective management.

CRP11. Use technology to enhance productivity.

Career Awareness, Exploration, and Preparation Content Area: 21st Century Life and Careers Strand C: Career Preparation

9.2.8.B.3 Evaluate communication, collaboration, and leadership skills that can be developed through school, home, work, and extracurricular activities for use in a career.

9.2.8.B.4 Evaluate how traditional and nontraditional careers have evolved regionally, nationally, and globally.

9.2.8.B.5 Analyze labor market trends using state and federal labor market information and other resources available online.

9.2.8.B.7 Evaluate the impact of online activities and social media on employer decisions.

Career & Technical Education Content Area: 21st Century Life and Careers Standards

9.3.ST.2 Use technology to acquire, manipulate, analyze and report data.

9.3.ST-SM.4 Apply critical thinking skills to review information, explain statistical analysis, and to translate, interpret and summarize research and statistical data.

9.3.ST-SM.3 Analyze the impact that science and mathematics has on society.

New Jersey Social and Emotional Learning Competencies and Sub-Competencies

Self-Awareness

- Recognize one's feelings and thoughts
- Recognize the impact of one's feelings and thoughts on one's own behavior
- Recognize one's personal traits, strengths, and limitations
- Recognize the importance of self-confidence in handling daily tasks and challenges

Self-Management

- Understand and practice strategies for managing one's own emotions, thoughts, and behaviors
- Recognize the skills needed to establish and achieve personal and educational goals
- Identify and apply ways to persevere or overcome barriers through alternative methods to achieve one's goals

Social Awareness

- Recognize and identify the thoughts, feelings, and perspectives of others
- Demonstrate an awareness of the differences among individuals, groups, and others' cultural backgrounds
- Demonstrate an understanding of the need for mutual respect when viewpoints differ
- Demonstrate an awareness of the expectations for social interactions in a variety of settings

Responsible Decision-Making

- Develop, implement, and model effective problem-solving and critical thinking skills
- Identify the consequences associated with one's actions in order to make constructive choices
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Relationship Skills

- Establish and maintain healthy relationships
- Utilize positive communication and social skills to interact effectively with others
- Identify ways to resist inappropriate social pressure
- Demonstrate the ability to prevent and resolve interpersonal conflicts in constructive ways
- Identify who, when, where, or how to seek help for oneself or others when needed

*Adopted by the New Jersey State Board of Education in August 2017

Instructional Plan

Pre-Assessment and Reflection

Pre-Assessment	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
Teacher-created assessment on identifying key features of linear and exponential functions, sketching linear and exponential functions, identifying domain and range of linear and exponential functions, calculating average rate of change for linear and exponential functions.	Listed below.

Student Learning Objectives (SLO), Strategies, Formative Assessment, Activities and Resources (add rows as needed)

SLO – WALT We are learning to/that	Student Strategies	Formative Assessment	Activities and Resources	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
F.IF.B.4. - WALT for functions that model a quadratic relationship, interpret key features of graphs and tables in the context of the problem **F.IF.B.4. - WALT** sketch graphs of quadratic functions, showing key features given a verbal description of the relationship 2 days	SMP2 - Reason abstractly and quantitatively. SMP3 - Construct viable arguments and critique the reasoning of others. SMP5 - Use appropriate tools strategically.	Day 1 Exit Ticket Day 2 Exit Ticket	Day 1 eMATH Guided Notes and Student Practice Notes Video Day 2 eMATH Guided Notes and Student Practice Notes Video	**ELL** - Read written instructions - Students may be provided with note organizers/study guides to reinforce key topics. - Model and provide examples - Extended time on assessments when needed. - Establish a non-verbal cue to

SLO – WALT We are learning to/that	Student Strategies	Formative Assessment	Activities and Resources	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
				redirect students when not on task. • Students may use a bilingual dictionary. • Pair Visual Prompts with Verbal Presentations • Highlight Key Words & Formulas **SPED/504** • Students may be provided with note organizers / study guides to reinforce key topics. • Extended time on assessments when needed. • Preferred seating to be determined by student and teacher. • Provide modified assessments when necessary. • Students may complete

SLO – WALT We are learning to/that	Student Strategies	Formative Assessment	Activities and Resources	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
				assessments in alternate settings when requested. • Establish a non-verbal cue to redirect students when not on task. • Maintain strong teacher / parent communication. • Repetition and practice • Pair Visual Prompts with Verbal Presentations • Provide Formulas • Check Use of Agenda **Gifted & Talented** • Use of Higher Level Questioning Techniques • Extension/Challenge Questions • Provide Assessments at a Higher Level of Thinking

SLO – WALT We are learning to/that	Student Strategies	Formative Assessment	Activities and Resources	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
				• Desmos Linear Activities - https://teacher.desmos.com/linear **At Risk** • Student contracts • Consistent communication with parents and counseling team.
F.IF.B.5. - WALT relate the domain of a quadratic function to its graph and to the quantitative relationship it describes in the context of the problem** 1 day	SMP2 - Reason abstractly and quantitatively. SMP3 - Construct viable arguments and critique the reasoning of others. SMP5 - Use appropriate tools strategically. SMP6 - Attend to precision.	Exit Ticket Name:_____ Score:___/___ Unit #8 – Lesson #8 Exit Ticket: Two consecutive, even integers have the property that their product is 30 more than nine times the smaller integer. Algebraically determine the two integers.	eMATH Guided Notes and Student Practice Notes Video	See above.
F.IF.B.6. - WALT calculate the average rate of change of a quadratic function, represented as a table of values, over a specified interval and interpret it in the context of the problem	SMP2 - Reason abstractly and quantitatively. SMP3 - Construct viable arguments and critique the reasoning of others.	Exit Ticket Name:_____ Score:___/___ Unit #3 – Lesson #6 Exit Ticket: The function g(x) is defined using the table below. Find the average rate of change of g(x) over the interval 2 ≤ x ≤ 8. Show your calculations. | x	2	4	8	9
g(x)	5	0	1	7 | Answer:	eMATH Guided Notes and Student Practice Notes Video	See above.

SLO – WALT We are learning to/that	Student Strategies	Formative Assessment	Activities and Resources	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
F.IF.B.6 - WALT estimate the average rate of change of a quadratic function, represented by a graph, over a specified interval and interpret it in the context of the problem **F.IF.B.6. - WALT** calculate the average rate of change of a quadratic function, defined by an expression, over a specified interval and interpret it in the context of the problem 1 day	SMP5 - Use appropriate tools strategically. SMP6 - Attend to precision.			
A.REI.B.4. - WALT solve quadratic equations by completing the square **A.REI.B.4. - WALT** use completing the square to rewrite a quadratic equation in the form $(x - p)^2 = q$ **A.REI.B.4. - WALT** use the form $(x - p)^2 = q$ to	SMP1 - Make sense of problems and persevere in solving them.	Day 1 Exit Ticket Name: _____ Score: ____/____ Unit #8 – Lesson #4 Exit Ticket: For the quadratic function $y = x^2 + 12x + 40$ do the following (a) Write the function in vertex form using the method of completing the square. (b) What are the coordinates of the function's turning point? Day 2 Exit Ticket Name: _____ Score: ____/____ Unit #9 – Lesson #6 Exit Ticket: Solve the quadratic equation below using the quadratic formula. Write your answers in simplest radical form. $x^2 - 8x + 4 = 0$ Quadratic Formula: $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$	Day 1 [eMATH Guided Notes and Student Practice](#) [Notes Video](#) Day 2 [eMATH Guided Notes and Student Practice](#) [Notes Video](#)	See above.

SLO – WALT We are learning to/that	Student Strategies	Formative Assessment	Activities and Resources	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
derive the quadratic formula **A.REI.B.4. - WALT** solve quadratic equations by using the quadratic formula **A.REI.B.4. - WALT** recognize, using the discriminant, when the quadratic formula gives complex solutions and write them as $a \pm bi$ 2 days				
A.CED.A.1. - WALT create quadratic equations in one variable to model a problem or situation **A.CED.A.1. - WALT** use quadratic equations in one variable to solve problems 1 day	SMP2 - Reason abstractly and quantitatively. SMP3 - Construct viable arguments and critique the reasoning of others. SMP6 - Attend to precision.	Exit Ticket Name: _____ Score: _____ / _____ Exit 68 – Lesson 48 Exit Ticket: Two consecutive, even integers have the property that their product is 30 more than nine times the smaller integer. Algebraically determine the two integers.	[eMATH Guided Notes and Student Practice](#) [Notes Video](#)	See above.

Benchmark Assessment 1

Benchmark Assessment	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
Interpret key features of quadratic functions using graphs and tables, sketch graphs of quadratic functions, identify domain and range of quadratic functions, sketch graphs of quadratic functions, calculate slope of quadratic functions	Listed above.

Benchmark Assessment 2

Benchmark Assessment	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
Solving quadratic functions by completing the square, factor by grouping, and quadratic formula, identify the discriminant, creating quadratic functions to model scenarios	Listed above.

Summative Assessments (add rows as needed)

Summative Assessment	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
Interpret key features of quadratic functions using graphs and tables, sketch graphs of quadratic functions, identify domain and range of quadratic functions, sketch graphs of quadratic functions, calculate slope of quadratic functions, solving quadratic functions by completing the square, factor by grouping, and quadratic formula, identify the discriminant, creating quadratic functions to model scenarios	Listed above.

Interdisciplinary Connections

Interdisciplinary Connections	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
Students can throw a baseball/football and hit a golf ball and film themselves. They can record the height of the ball while in the air and create a quadratic function that represents the path each ball traveled. The students can then compare both functions.	Listed above.

Unit Title: Algebra 1 – Quadratic Modeling – Unit 3 - Module C

Grade level: 9   **Timeframe: 8 days**

Guiding Questions

1) How can you graph a quadratic function?
2) What is the difference between a linear function and quadratic function when represented in table form?
3) How can you compare linear functions and quadratic functions when graphed?
4) What affects the graph of a function when changes are made to the original function?

Standards

Standards (Taught and Assessed):

☐ **F.IF.C.7** Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.★ (modeling standard)
     a. Graph linear and quadratic functions and show intercepts, maxima, and minima.

☐ **F.LE.A.3** Observe using graphs and tables that a quantity increasing exponentially eventually exceeds a quantity increasing linearly, quadratically, or (more generally) as a polynomial function.

☐ **F.IF.C.8** Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function.
     a. Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context.

☐ **F.IF.C.9** Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). *For example, given a graph of one quadratic function and an algebraic expression for another, say which has the larger maximum.*

◉ **F.BF.B.3.** Identify the effect on the graph of replacing $f(x)$ by $f(x) + k$, $k\,f(x)$, $f(kx)$, and $f(x + k)$ for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them.

Key: ■ Major Cluster   ☐ Supporting Cluster   ◉ Additional Cluster

Highlighted Career Ready Practices and 21st Century Themes/Skills

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.

CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.

CRP9. Model integrity, ethical leadership and effective management.

CRP11. Use technology to enhance productivity.

Career Awareness, Exploration, and Preparation Content Area: 21st Century Life and Careers Strand C: Career Preparation

9.2.8.B.3 Evaluate communication, collaboration, and leadership skills that can be developed through school, home, work, and extracurricular activities for use in a career.

9.2.8.B.4 Evaluate how traditional and nontraditional careers have evolved regionally, nationally, and globally.

9.2.8.B.5 Analyze labor market trends using state and federal labor market information and other resources available online.

9.2.8.B.7 Evaluate the impact of online activities and social media on employer decisions.

Career & Technical Education Content Area: 21st Century Life and Careers Standards

9.3.ST.2 Use technology to acquire, manipulate, analyze and report data.

9.3.ST-SM.4 Apply critical thinking skills to review information, explain statistical analysis, and to translate, interpret and summarize research and statistical data.

9.3.ST-SM.3 Analyze the impact that science and mathematics has on society.

New Jersey Social and Emotional Learning Competencies and Sub-Competencies

Self-Awareness

- Recognize one's feelings and thoughts
- Recognize the impact of one's feelings and thoughts on one's own behavior
- Recognize one's personal traits, strengths, and limitations
- Recognize the importance of self-confidence in handling daily tasks and challenges

Self-Management

- Understand and practice strategies for managing one's own emotions, thoughts, and behaviors
- Recognize the skills needed to establish and achieve personal and educational goals
- Identify and apply ways to persevere or overcome barriers through alternative methods to achieve one's goals

Social Awareness

- Recognize and identify the thoughts, feelings, and perspectives of others
- Demonstrate an awareness of the differences among individuals, groups, and others' cultural backgrounds
- Demonstrate an understanding of the need for mutual respect when viewpoints differ
- Demonstrate an awareness of the expectations for social interactions in a variety of settings

Responsible Decision-Making

- Develop, implement, and model effective problem-solving and critical thinking skills
- Identify the consequences associated with one's actions in order to make constructive choices
- Evaluate personal, ethical, safety, and civic impact of decisions

Relationship Skills

- Establish and maintain healthy relationships
- Utilize positive communication and social skills to interact effectively with others
- Identify ways to resist inappropriate social pressure
- Demonstrate the ability to prevent and resolve interpersonal conflicts in constructive ways
- Identify who, when, where, or how to seek help for oneself or others when needed
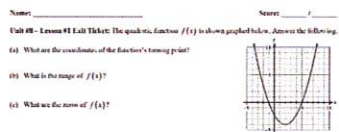
*Adopted by the New Jersey State Board of Education in August 2017

Instructional Plan

Pre-Assessment and Reflection

Pre-Assessment	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
Teacher-created assessment on graphing linear functions and identifying key features of the function, identifying the effects on linear functions when values are added or subtracted	Listed below.

Student Learning Objectives (SLO), Strategies, Formative Assessment, Activities and Resources (add rows as needed)
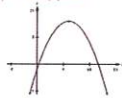
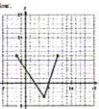| SLO – WALT We are learning to/that	Student Strategies	Formative Assessment	Activities and Resources	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
F.IF.C.7. - WALT graph quadratic functions expressed symbolically and show intercepts, maxima or minima 1 day	SMP1 - Make sense of problems and persevere in solving them. SMP4 - Model with mathematics. SMP5 - Use appropriate tools strategically. SMP7 - Look for and make use of structure.	Exit Ticket 	eMATH Guided Notes and Student Practice Notes Video	**ELL** • Read written instructions • Students may be provided with note organizers/study guides to reinforce key topics. • Model and provide examples • Extended time on assessments when needed. • Establish a non-verbal cue to redirect students when not on task.

SLO – WALT We are learning to/that	Student Strategies	Formative Assessment	Activities and Resources	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
				• Students may use a bilingual dictionary. • Pair Visual Prompts with Verbal Presentations • Highlight Key Words & Formulas **SPED/504** • Students may be provided with note organizers / study guides to reinforce key topics. • Extended time on assessments when needed. • Preferred seating to be determined by student and teacher. • Provide modified assessments when necessary. • Students may complete assessments in

SLO – WALT We are learning to/that	Student Strategies	Formative Assessment	Activities and Resources	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
				alternate settings when requested. • Establish a non-verbal cue to redirect students when not on task. • Maintain strong teacher / parent communication. • Repetition and practice • Pair Visual Prompts with Verbal Presentations • Provide Formulas • Check Use of Agenda **Gifted & Talented** • Use of Higher Level Questioning Techniques • Extension/Challenge Questions • Provide Assessments at a Higher Level of Thinking

SLO – WALT We are learning to/that	Student Strategies	Formative Assessment	Activities and Resources	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
				• Desmos Linear Activities - https://teacher.desmos.com/linear **At Risk** • Student contracts • Consistent communication with parents and counseling team.
F.LE.A.3. – WALT use graphs and tables to observe that a quantity that increases exponentially eventually exceeds a quantity that increases quadratically 1 day	SMP7 - Look for and make use of structure.	Exit Ticket Name:_____ Score:_____/_____ Unit #6 – Lesson #8 Exit Ticket: The table below represents some values of an exponential function | x | 0 | 1 | 2 | 3 | | y | 4 | 12 | 36 | 108 | (a) Explain how you can tell from the table that this is not a linear function. (b) Write the equation of the exponential function in $y = a(b)^x$ form.	eMATH Guided Notes and Student Practice Notes Video	See above.
F.IF.C.8. - WALT use the process of factoring in a quadratic function to show and interpret the zeros of the function in the context of the problem **F.IF.C.8. - WALT** use the process of completing the square in a quadratic function to show extreme	SMP5 - Use appropriate tools strategically. SMP7 - Look for and make use of structure.	Day 1 Exit Ticket Name:_____ Score:_____/_____ Unit #8 – Lesson #6 Exit Ticket: Solve the following equation by factoring (using the Zero Product Law). Show your work. $x^2 + 4x - 21 = 0$ How do the solutions to the equation above relate to the graph of $y = x^2 + 4x - 21$? Day 2 Exit Ticket	Day 1 eMATH Guided Notes and Student Practice Notes Video Day 2 eMATH Guided Notes and Student Practice	See above.

SLO – WALT We are learning to/that	Student Strategies	Formative Assessment	Activities and Resources	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
values and symmetry of the graph and interpret these in the context of the problem 2 days		Name: _____ Score: ___/___ Unit #9 – Lesson #4 Exit Ticket: For the quadratic function $y = x^2 + 12x + 40$ do the following (a) Write the function in vertex form using the method of completing the square. (b) What are the coordinates of the function's turning point?	Notes Video	
F.IF.C.9. - WALT compare properties of two quadratic functions each represented in different ways (numerically, graphically, algebraically, or verbally) 1 day	SMP1 - Make sense of problems and persevere in solving them. SMP6 - Attend to precision. SMP8 - Look for and express regularity in repeated reasoning.	Exit Ticket Name: _____ Score: ___/___ Unit #11 – Lesson #4 Exit Ticket: A baby cow, known as a calf, was born with a weight of 62 pounds. After one month, its weight had risen to 107 pounds. Based only on the information given, write both a linear model and an exponential model for the weight of the calf, w, as a function of the number of months, m, since it was born. Round the base of your exponential model to the nearest hundredth. Linear Model Exponential Model	eMATH Guided Notes and Student Practice Notes Video	See above.
F.BF.B.3. - WALT identify the effect on the graph of replacing $f(x)$ by $f(x) + k$, k $f(x)$, $f(kx)$, and $f(x + k)$ for specific values of k, and illustrate an explanation of the effects on the graph using technology **F.BF.B.3. - WALT** identify the effect on the graph of quadratic functions by replacing $f(x)$ by $kf(x)$ and $f(kx)$ for specific values of k, and illustrate an	SMP5 - Use appropriate tools strategically.	Day 1 Exit Ticket Name: _____ Score: ___/___ Unit #8 – Lesson #3 Exit Ticket: The quadratic function $y = -\frac{1}{2}(x-6)^2 + 3$ is shown graphed below. What are the coordinates of the function's turning point? State below and label on the graph. Day 2 Exit Ticket Name: _____ Score: ___/___ Unit #8 – Lesson #5 Exit Ticket: For the quadratic function $y = 5x^2 - 30x + 77$: (a) Write the function in the form $y = a(x-4)^2 + 3$. Show the work that leads to your answer. (b) What are the coordinates of the function's turning point? Day 3 Exit Ticket	Day 1 eMATH Guided Notes and Student Practice Notes Video Day 2 eMATH Guided Notes and Student Practice Notes Video Day 3	See above.

SLO – WALT We are learning to/that	Student Strategies	Formative Assessment	Activities and Resources	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
explanation of the effects on the graph using technology **F.BF.B.3. - WALT** find the value of k given graphs of quadratic functions **F.BF.B.3. - WALT** experiment with all cases, $f(x) + k$, $f(x + k)$, $kf(x)$ and $f(kx)$, and illustrate an explanation of the effects on the graph using technology **F.BF.B.3. - WALT** recognize even and odd functions from their graphs and algebraic expressions for them 3 days		Name: _____ Score: ___ / ___ Unit #11 – Lesson #2 Exit Ticket: The function $f(x)$ is shown graphed below. Another function, g, is defined by $g(x)=f\left(\frac{1}{2}x\right)$. (a) What is the value of $g(4)$? Show how you found your answer. (b) Produce a graph of $g(x)$ on the same grid.	eMATH Guided Notes and Student Practice Notes Video	

Benchmark Assessment 1

Benchmark Assessment	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
Graph quadratic functions and label maxima/minima and intercepts, use graphs and tables to identify functions that grow quadratically and exponentially, factor quadratic functions to determine the zeros and explain the zeros in the context of the problem, show symmetry with quadratic functions	Listed above.

Benchmark Assessment 2

Benchmark Assessment	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
Compare quadratic functions to each other, identify the effect on the graph of quadratic functions when they are shifted or stretched/compressed, explains the effect on the graph of quadratic functions when they are shifted or stretched/compressed, identify odd/even functions	Listed above.

Summative Assessments (add rows as needed)

Summative Assessment	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
Graph quadratic functions and label maxima/minima and intercepts, use graphs and tables to identify functions that grow quadratically and exponentially, factor quadratic functions to determine the zeros and explain the zeros in the context of the problem, show symmetry with quadratic functions, compare quadratic functions to each other, identify the effect on the graph of quadratic functions when they are shifted or stretched/compressed, explains the effect on the graph of quadratic functions when they are shifted or stretched/compressed, identify odd/even functions	Listed above.

Interdisciplinary Connections

Interdisciplinary Connections	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
Students can throw baseballs or footballs at different heights and on different days and film their throws. The students can create functions that represent each throw. The different heights will represent a shift with the quadratic function. The different days should have different wind positions, which would represent stretching or compressing with the quadratic function. The students can then compare their functions on the different days to see the effects of those elements.	Listed above.

Unit 4A

Unit Title: Algebra 1 – Other Nonlinear Graphs and One Variable Statistics – Unit 4 - Module A

Grade level: 9   **Timeframe: 6 days**

Guiding Questions

1) What are zeros of polynomial functions?
2) How can you find zeros of a polynomial function when given as a graph or an equation?
3) What key features are needed to create a sketch of a polynomial function?

Standards

Standards (Taught and Assessed):

☐ **A.APR.B.3** Identify zeros of polynomials when suitable factorizations are available, and use the zeros to construct a rough graph of the function defined by the polynomial.

☐ **F.IF.C.7** Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.★ (modeling standard)

   c. Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior.

   b. Graph square root, cube root, and piecewise-defined functions, including step-functions and absolute value functions.

☐ **A.REI.D.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.★ (★modeling standard)

Key: ■ Major Cluster   ☐ Supporting Cluster   ◎ Additional Cluster

Highlighted Career Ready Practices and 21st Century Themes/Skills

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.

CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.

CRP9. Model integrity, ethical leadership and effective management.

CRP11. Use technology to enhance productivity.

Career Awareness, Exploration, and Preparation Content Area: 21st Century Life and Careers Strand C: Career Preparation

9.2.8.B.3 Evaluate communication, collaboration, and leadership skills that can be developed through school, home, work, and extracurricular activities for use in a career.

9.2.8.B.4 Evaluate how traditional and nontraditional careers have evolved regionally, nationally, and globally.

9.2.8.B.5 Analyze labor market trends using state and federal labor market information and other resources available online.

9.2.8.B.7 Evaluate the impact of online activities and social media on employer decisions.

Career & Technical Education Content Area: 21st Century Life and Careers Standards

9.3.ST.2 Use technology to acquire, manipulate, analyze and report data.

9.3.ST-SM.4 Apply critical thinking skills to review information, explain statistical analysis, and to translate, interpret and summarize research and statistical data.

9.3.ST-SM.3 Analyze the impact that science and mathematics has on society.

New Jersey Social and Emotional Learning Competencies and Sub-Competencies

Self-Awareness

- Recognize one's feelings and thoughts
- Recognize the impact of one's feelings and thoughts on one's own behavior
- Recognize one's personal traits, strengths, and limitations
- Recognize the importance of self-confidence in handling daily tasks and challenges

Self-Management

- Understand and practice strategies for managing one's own emotions, thoughts, and behaviors
- Recognize the skills needed to establish and achieve personal and educational goals
- Identify and apply ways to persevere or overcome barriers through alternative methods to achieve one's goals

Social Awareness

- Recognize and identify the thoughts, feelings, and perspectives of others
- Demonstrate an awareness of the differences among individuals, groups, and others' cultural backgrounds
- Demonstrate an understanding of the need for mutual respect when viewpoints differ
- Demonstrate an awareness of the expectations for social interactions in a variety of settings

Responsible Decision-Making

- Develop, implement, and model effective problem-solving and critical thinking skills
- Identify the consequences associated with one's actions in order to make constructive choices
- Evaluate personal, ethical, safety, and civic impact of decisions

Relationship Skills

- Establish and maintain healthy relationships
- Utilize positive communication and social skills to interact effectively with others
- Identify ways to resist inappropriate social pressure
- Demonstrate the ability to prevent and resolve interpersonal conflicts in constructive ways
- Identify who, when, where, or how to seek help for oneself or others when needed

*Adopted by the New Jersey State Board of Education in August 2017

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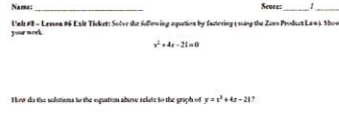# Instructional Plan

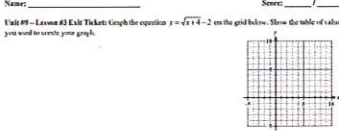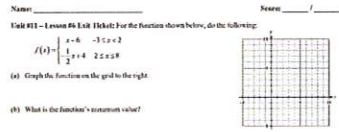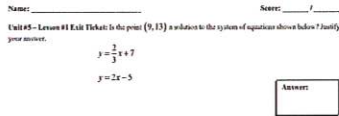## Pre-Assessment and Reflection

| Pre-Assessment	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
Teacher-created assessment on finding GCF of numbers, factoring quadratics, identifying intercepts on graphs of linear and quadratic functions	Listed below.

Student Learning Objectives (SLO), Strategies, Formative Assessment, Activities and Resources (add rows as needed)

SLO – WALT We are learning to/that	Student Strategies	Formative Assessment	Activities and Resources	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
A.APR.B.3. - WALT identify the zeros of a polynomial function when suitable factorizations are available **A.APR.B.3. - WALT** use the zeros to construct a rough graph of the function defined by the polynomial 1 day	SMP1 - Make sense of problems and persevere in solving them. SMP5 - Use appropriate tools strategically.	Exit Ticket Name: _____ Score: _____ Unit #8 – Lesson #7 Exit Ticket: For the quadratic function $y = x^2 - 12x + 20$ do the following. (a) Find the zeroes of the quadratic function algebraically by factoring. (b) Find the x-coordinate of the turning point using your answers from (a).	[eMATH Guided Notes and Student Practice](#) [Notes Video](#)	**ELL** ● Read written instructions ● Students may be provided with note organizers/study guides to reinforce key topics. ● Model and provide examples ● Extended time on assessments when needed. ● Establish a non-verbal cue to redirect students when not on task.

SLO – WALT We are learning to/that	Student Strategies	Formative Assessment	Activities and Resources	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
				• Students may use a bilingual dictionary. • Pair Visual Prompts with Verbal Presentations • Highlight Key Words & Formulas **SPED/504** • Students may be provided with note organizers / study guides to reinforce key topics. • Extended time on assessments when needed. • Preferred seating to be determined by student and teacher. • Provide modified assessments when necessary. • Students may complete assessments in

SLO – WALT We are learning to/that	Student Strategies	Formative Assessment	Activities and Resources	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
				alternate settings when requested. • Establish a non-verbal cue to redirect students when not on task. • Maintain strong teacher / parent communication. • Repetition and practice • Pair Visual Prompts with Verbal Presentations • Provide Formulas • Check Use of Agenda **Gifted & Talented** • Use of Higher Level Questioning Techniques • Extension/Challenge Questions • Provide Assessments at a Higher Level of Thinking

SLO – WALT We are learning to/that	Student Strategies	Formative Assessment	Activities and Resources	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
F.IF.C.7.c - WALT graph polynomial functions showing end behavior 1 day	SMP3 - Construct viable arguments and critique the reasoning of others. SMP6 - Attend to precision.	Exit Ticket Name: _____ Score: ___/___ Unit #8 – Lesson #6 Exit Ticket: Solve the following equation by factoring (using the Zero Product Law). Show your work. $x^2 + 4x - 21 = 0$ How do the solutions to the equation above relate to the graph of $y = x^2 + 4x - 21$?	[eMATH Guided Notes and Student Practice](#) [Notes Video](#)	See above.
F.IF.C.7.b - WALT graph square root, cube root, and show key features of the graph **F.IF.C.7.b - WALT** graph piecewise-defined functions, including step functions and absolute value functions, and show key features of the graph 2 days	SMP5 - Use appropriate tools strategically. SMP7 - Look for and make use of structure.	Day 1 Exit Ticket Name: _____ Score: ___/___ Unit #9 – Lesson #3 Exit Ticket: Graph the equation $y = \sqrt{x+4} - 2$ on the grid below. Show the table of values you used to create your graph. Day 2 Exit Ticket Name: _____ Score: ___/___ Unit #11 – Lesson #6 Exit Ticket: For the function shown below, do the following: $f(x) = \begin{cases} x-6 & -3 \le x < 2 \\ -\frac{1}{2}x+4 & 2 \le x \le 8 \end{cases}$ (a) Graph the function on the grid to the right. (b) What is the function's minimum value?	Day 1 [eMATH Guided Notes and Student Practice](#) [Notes Video](#) Day 2 [eMATH Guided Notes and Student Practice](#) [Notes Video](#)	See above.
A.REI.D.11. - WALT in cases where $f(x)$ and/or $g(x)$ are linear, polynomial, absolute value, and exponential, explain why the x-coordinate of the point of intersection of graphs of $f(x)$ and $g(x)$ is the solution of the equation $f(x) = g(x)$	SMP1 - Make sense of problems and persevere in solving them. SMP5 - Use appropriate tools strategically.	Day 1 Exit Ticket Name: _____ Score: ___/___ Unit #5 – Lesson #1 Exit Ticket: Is the point $(9, 13)$ a solution to the system of equations shown below? Justify your answer. $y = \frac{2}{3}x + 7$ $y = 2x - 5$ Answer: [ ] Day 2 Exit Ticket	Day 1 [eMATH Guided Notes and Student Practice](#) [Notes Video](#) Day 2 [eMATH Guided Notes and Student Practice](#)	See above.

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SLO – WALT We are learning to/that	Student Strategies	Formative Assessment	Activities and Resources	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
A.REI.D.11. - WALT in cases where cases where $f(x)$ and/or $g(x)$ are linear, polynomial, absolute value, and exponential, find approximate solutions using technology to graph the functions, make tables, and find successive approximations in order to find the solution of the equation $f(x) = g(x)$ 2 days		Name: _____ Score: __/__ Unit #5 – Lesson #6 Exit Ticket: The equation $y = x^2 - 6x + 5$ is shown graphed below. Use it to find all solutions to the equation shown below. Justify your solutions. $x^2 - 6x + 5 = 5$ Answers:	[Notes Video](#)	

Benchmark Assessment 1

Benchmark Assessment	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
Finding zeros of quadratics algebraically, creating a sketch of a quadratic using the zeros and the leading coefficient, graphing polynomial functions showing end behavior	Listed above.

Benchmark Assessment 2

Benchmark Assessment	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
Graph square root and cube root functions, identify key features of square root and cube root functions, graphing piecewise functions, identify if an x-coordinate is a solution between two functions and explain why it is	Listed above.

Summative Assessments (add rows as needed)

Summative Assessment	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
Finding zeros of quadratics algebraically, creating a sketch of a quadratic using the zeros and the leading coefficient, graphing polynomial functions showing end behavior, graph square root and cube root functions, identify key features of square root and cube root functions, graphing piecewise functions, identify if an x-coordinate is a solution between two functions and explain why it is	Listed above.

Interdisciplinary Connections

Interdisciplinary Connections	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
Students can create their own tax brackets and compare it to the United States tax brackets. With the tax brackets, they can create piecewise functions to represent and compare the two brackets.	Listed above.

Unit 4B

Unit Title: Algebra 1 – Other Nonlinear Graphs and One Variable Statistics – Unit 4 - Module B	
Grade level: 9	**Timeframe: 7 days**

Guiding Questions

1) What is a histogram?
2) What is a dot plot?
3) What is a box plot?
4) What are the advantages and disadvantages of using a histogram, dot plot, and box plot?
5) What is a two-way frequency table?
6) What is mean, median, mode, and range?

Standards

Standards (Taught and Assessed):

○ **S.ID.A.1** Represent data with plots on the real number line (dot plots, histograms, and box plots).

□ **N.Q.A.1** Use units as a way to understand problems and to guide the solution of multi-step problems; Choose and interpret units consistently in formulas; Choose and interpret the scale and the origin in graphs and data displays.

○ **S.ID.A.2** Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets.

○ **S.ID.A.3** Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).

□ **S.ID.B.5** Summarize categorical data for two categories in two-way frequency tables. Interpret relative frequencies in the context of the data (including joint, marginal, and conditional relative frequencies). Recognize possible associations and trends in the data.

Key: ■ Major Cluster   □ Supporting Cluster   ◎ Additional Cluster

Highlighted Career Ready Practices and 21st Century Themes/Skills

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.

CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.

CRP9. Model integrity, ethical leadership and effective management.

CRP11. Use technology to enhance productivity.

Career Awareness, Exploration, and Preparation Content Area: 21st Century Life and Careers Strand C: Career Preparation

9.2.8.B.3 Evaluate communication, collaboration, and leadership skills that can be developed through school, home, work, and extracurricular activities for use in a career.

9.2.8.B.4 Evaluate how traditional and nontraditional careers have evolved regionally, nationally, and globally.

9.2.8.B.5 Analyze labor market trends using state and federal labor market information and other resources available online.

9.2.8.B.7 Evaluate the impact of online activities and social media on employer decisions.

Career & Technical Education Content Area: 21st Century Life and Careers Standards

9.3.ST.2 Use technology to acquire, manipulate, analyze and report data.

9.3.ST-SM.4 Apply critical thinking skills to review information, explain statistical analysis, and to translate, interpret and summarize research and statistical data.

9.3.ST-SM.3 Analyze the impact that science and mathematics has on society.

New Jersey Social and Emotional Learning Competencies and Sub-Competencies

Self-Awareness

- Recognize one's feelings and thoughts
- Recognize the impact of one's feelings and thoughts on one's own behavior
- Recognize one's personal traits, strengths, and limitations
- Recognize the importance of self-confidence in handling daily tasks and challenges

Self-Management

- Understand and practice strategies for managing one's own emotions, thoughts, and behaviors
- Recognize the skills needed to establish and achieve personal and educational goals
- Identify and apply ways to persevere or overcome barriers through alternative methods to achieve one's goals

Social Awareness

- Recognize and identify the thoughts, feelings, and perspectives of others
- Demonstrate an awareness of the differences among individuals, groups, and others' cultural backgrounds
- Demonstrate an understanding of the need for mutual respect when viewpoints differ
- Demonstrate an awareness of the expectations for social interactions in a variety of settings

Responsible Decision-Making

- Develop, implement, and model effective problem-solving and critical thinking skills
- Identify the consequences associated with one's actions in order to make constructive choices
- Evaluate personal, ethical, safety, and civic impact of decisions

Relationship Skills

- Establish and maintain healthy relationships
- Utilize positive communication and social skills to interact effectively with others
- Identify ways to resist inappropriate social pressure
- Demonstrate the ability to prevent and resolve interpersonal conflicts in constructive ways
- Identify who, when, where, or how to seek help for oneself or others when needed

*Adopted by the New Jersey State Board of Education in August 2017

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Instructional Plan

Pre-Assessment and Reflection

Pre-Assessment	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
Teacher-created assessment on finding mean, median, mode, and range, creating box-and-whisker plots, and creating histograms	Listed below.
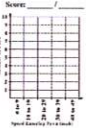
Student Learning Objectives (SLO), Strategies, Formative Assessment, Activities and Resources (add rows as needed)

SLO – WALT We are learning to/that	Student Strategies	Formative Assessment	Activities and Resources	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
S.ID.A.1. - WALT represent data using dot plots on the real number line and choose an appropriate scale to represent the data **S.ID.A.1. - WALT** represent data using histograms on the real number line and choose an appropriate scale to represent the data 1 day	SMP2 - Reason abstractly and quantitatively. SMP4 - Model with mathematics. SMP5 - Use appropriate tools strategically.	Exit Ticket 	[eMATH Guided Notes and Student Practice](#) [Notes Video](#)	**ELL** • Read written instructions • Students may be provided with note organizers/study guides to reinforce key topics. • Model and provide examples • Extended time on assessments when needed. • Establish a non-verbal cue to redirect students when not on task.

SLO – WALT We are learning to/that	Student Strategies	Formative Assessment	Activities and Resources	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
				• Students may use a bilingual dictionary. • Pair Visual Prompts with Verbal Presentations • Highlight Key Words & Formulas **SPED/504** • Students may be provided with note organizers / study guides to reinforce key topics. • Extended time on assessments when needed. • Preferred seating to be determined by student and teacher. • Provide modified assessments when necessary. • Students may complete assessments in

SLO – WALT We are learning to/that	Student Strategies	Formative Assessment	Activities and Resources	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
				alternate settings when requested. • Establish a non-verbal cue to redirect students when not on task. • Maintain strong teacher / parent communication. • Repetition and practice • Pair Visual Prompts with Verbal Presentations • Provide Formulas • Check Use of Agenda **Gifted & Talented** • Use of Higher Level Questioning Techniques • Extension/Challenge Questions • Provide Assessments at a Higher Level of Thinking

SLO – WALT We are learning to/that	Student Strategies	Formative Assessment	Activities and Resources	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
N.Q.A.1. - WALT represent data using box plots on the real number line and choose an appropriate scale to represent the data 1 day	SMP3 - Construct viable arguments and critique the reasoning of others. SMP4 - Model with mathematics.	Exit Ticket *Name:_____ Score:____ /____* *Unit #11 – Lesson #8 Exit Ticket: Marissa weighs a piece of quartz on a scale and finds that it weighs 8.4 grams. She looks up the density of quartz online and finds that it is 2.648 grams per cubic centimeter.* *What is the volume of the rock that Marissa weighed in cubic centimeters? Round to an appropriate level of precision.* *Why did you round to the level that you did? Explain.*	[eMATH Guided Notes and Student Practice](#) [Notes Video](#)	See above.
S.ID.A.2. - WALT compare the center (mean, median) and spread (interquartile range, standard deviation) of two or more different data sets using measures appropriate to the shape of the data 2 days	SMP2 - Reason abstractly and quantitatively. SMP6 - Attend to precision.	Day 1 Exit Ticket *Name:_____ Score:____ /____* *Unit #10 – Lesson #2 Exit Ticket: Seventeen students in a physical education class recorded how many pushups they could do in a row before they got tired. The data is shown below in ascending order.* *4, 6, 6, 8, 9, 9, 9, 10, 11, 13, 13, 15, 18, 20, 20, 21, 24.* *Determine the median and quartile values for this data set and then create a box plot on the number line below.* Day 2 Exit Ticket *Name:_____ Score:____ /____* *Unit #10 – Lesson #4 Exit Ticket: Mr. Lopez takes a random sample of 12 students scores on a recent math test. The sample is shown below.* *72, 78, 76, 82, 86, 71, 92, 84, 89, 95, 81, 88* *For this sample calculate* *(a) the interquartile range (b) the standard deviation (round to the nearest tenth)*	Day 1 [eMATH Guided Notes and Student Practice](#) [Notes Video](#) Day 2 [eMATH Guided Notes and Student Practice](#) [Notes Video](#)	See above.
S.ID.A.3. - WALT interpret differences in shape, center, and spread in the context of data sets **S.ID.A.3. - WALT** interpret the effect of outliers on the shape,	SMP2 - Reason abstractly and quantitatively. SMP3 - Construct viable arguments and critique the reasoning of others. SMP5 - Use appropriate tools strategically.	Exit Ticket *Name:_____ Score:____ /____* *Unit #10 – Lesson #3 Exit Ticket: 10 apples have their weights displayed below in ounces:* *3.2, 3.6, 4.1, 4.5, 4.8, 5.4, 5.5, 5.8, 6.1, 6.4* *The total weight of the 10 apples is 49.4 ounces. Which is greater, the median weight or the mean weight? Support your answer.*	[eMATH Guided Notes and Student Practice](#) [Notes Video](#)	See above.

SLO – WALT We are learning to/that	Student Strategies	Formative Assessment	Activities and Resources	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
center, and spread of a data set 1 day				
S.ID.B.5. - WALT summarize categorical data for two categories in a two-way frequency table **S.ID.B.5. - WALT** interpret relative frequencies, including joint, marginal, and conditional relative frequencies, in the context of the data **S.ID.B.5. - WALT** recognize possible associations and trends in categorical data 2 days	SMP3 - Construct viable arguments and critique the reasoning of others. SMP5 - Use appropriate tools strategically.	Day 1 Exit Ticket Day 2 Exit Ticket	Day 1 eMATH Guided Notes and Student Practice Notes Video Day 2 eMATH Guided Notes and Student Practice Notes Video	See above.

Benchmark Assessment 1

Benchmark Assessment	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
Represent data using dot plots and histograms, calculate mean, median, mode, and range, calculate interquartile range and standard deviation of data sets	Listed above.

Benchmark Assessment 2

Benchmark Assessment	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
Interpret differences in the spread of data sets, interpret the effect the outlier has on a data set, create data for two-way frequency tables, identify joint, marginal, and relative frequencies, recognize trends in data sets	Listed above.

Summative Assessments (add rows as needed)

Summative Assessment	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
Represent data using dot plots and histograms, calculate mean, median, mode, and range, calculate interquartile range and standard deviation of data sets, interpret differences in the spread of data sets, interpret the effect the outlier has on a data set, create data for two-way frequency tables, identify joint, marginal, and relative frequencies, recognize trends in data sets	Listed above.

Interdisciplinary Connections

Interdisciplinary Connections	Modifications (ELL, Special Education, Gifted, At-risk of Failure, 504) and Reflections
Students can create a two-way frequency table with data on hair color and eye color of their classmates. They can determine if there is a trend or dependence with having certain hair or eye colors.	Listed above.