Algebra 1 Grade 9

Prepared by:

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Superintendent of Schools:

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Algebra 1

Course Description:

Algebra I is taught in eight units throughout the school year. The Algebra I curriculum is a rigorous, openended and sequential process of connecting previously learned algebraic topics and expanding them to include polynomial expressions, quadratic equations and exponential functions. As part of the spiraling curriculum, aspects of Pre-Algebra and elementary Geometry are taught throughout the year. A guided inquiry program gives students the opportunity to explore topics and concepts through mathematical investigations.

Taking part in this course helps students:

- 1. To foster a lifelong enjoyment of learning mathematics.
- 2. To observe mathematics in the world around them.
- 3. To meet the mathematics standards for New Jersey Public Schools.

Course Sequence:

Unit 1: Number Properties and Operations in Algebra: 13 days

- Unit 2: Equations and Inequalities: 32 days
- Unit 3: Graphing Linear Equations and Functions: 27 days
- Unit 4: Writing Linear Equations: 17 days
- Unit 5: Systems of Equations and Inequalities: 24 days
- Unit 6: Exponents and exponential Functions: 21 days
- Unit 7: Polynomials and Factoring: 24 days
- Unit 8: Quadratic Equations and Functions: 19 days

*The number of instructional days is an estimate based on the information available at this time. 1 day equals approximately 48 minutes of seat time. Teachers are strongly encouraged to review the entire unit of study carefully and collaboratively to determine whether adjustments to this estimate need to be made.

Pre-requisite:

Pre-Algebra

Unit #1 - Overview

Content Area: Algebra 1

Unit Title: Number Properties and Operations in Algebra

Grade Level: 9

Core Ideas: Students will learn the subsets of the real number system and will be able to categorize numbers into designated subcategories. Students will also simplify and evaluate algebraic expressions. They will identify patterns and apply order of operations to solve real-world problems.

	Unit # 1 - Standards
Standards (Content and Te	echnology):
CPI#:	Statement:
Performance Expectation	s (NJSLS)
NJSLS.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.
NJSLS.A-SSE.A.1	Interpret expression 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.
NJSLS.A-SSE.A.2	Use the structure of an expression to identify ways to rewrite it.
Mathematical Practices	
MP 1	Make sense of problems and persevere in solving them.
MP 2	Reason abstractly and quantitatively.
MP 3	Construct viable arguments and critique the reasoning of others.
MP 4	Model with mathematics.
MP 5	Use appropriate tools strategically.
MP 6	Attend to precision.
MP 7	Look for and make use of structure.
MP 8	Look for and express regularity in repeated reasoning.
Career Readiness, Life Li 9.2.12.CAP.5	
9.2.12.CAP.5 9.4.12.CI.1	Assess and modify a personal plan to support current interests and postsecondary plans. Demonstrate the ability to reflect, analyze, and use creative skills and ideas
9.4.12.CI.1 9.4.12.CI.3	Investigate new challenges and opportunities for personal growth, advancement, and
9.4.12.CI.3	transition
9.4.12.TL.4	Collaborate in online learning communities or social networks or virtual worlds to
7. 4 .12.1L. 4	analyze and propose a resolution to a real-world problems
Computer Science and De	
8.1.12.CS.2	Model interactions between application software, system software, and hardware
8.2.12.ITH.3	Analyze the impact that globalization, social media, and access to open source
	technologies has had on innovation and on a society's economy, politics, and culture
8.2.12.EC.2	Assess the positive and negative impacts of emerging technologies on developing
	countries and evaluate how individuals, non-profit organizations, and governments have
	responded
Intercultural Statements	(Amistad, Holocaust, LGBT, etc)
LGBTQ and Disabilities	Explore mathematicians in the LGBTQ and disabled community, including but not
NJSA 18A:35-4.35	limited to Ron Buckmire, Professor of Mathematics at Occidental College in Los
	Angeles, Emily Riehl, Associate Professor of Mathematics at Johns Hopkins University
	in Baltimore and Stephen Hawking, former Director of Research at the University of
	Cambridge.
Amistad Law	Explore African-American mathematicians and scientists, including but not limited to
NJSA 18A:35-4.43	Martha Euphemia Lofton Haynes, the first African-American woman to earn a Ph.D in
	mathematics, and Elbert Frank Cox, the first African-American man to earn a Ph.D in
	mathematics in the world.
	Discuss and analyze the movie <i>Hidden Figures</i> , the story of female African-American
	mathematicians and engineers who worked for NASA

Holocaust Law	Explore Jewish mathematicia	ans using the article "Jewish Mathematicians Who Changed			
NJSA 18A:35-28	the Course of History" from	•			
AAPI Law		Pacific Islander mathematicians and scientists, including			
NJSA 18A:25-4.44	but not limited to Dr. Peter T	sai, inventor of the N95 respirator and Diana Ma, data			
	scientist and statistician for the	ne Lakers			
Companion Standards					
RST.9-10.7		nical information expressed in words in a text into visual			
		nd translate information expressed visually or			
	mathematically (e.g., in an ed	quation) into words			
RST.11-12.7		le sources of information presented in diverse formats and			
		, video, multimedia) in order to address a question or solve a			
DCT 11 12 0	problem.	1			
RST.11-12.8		a, analysis, and conclusions in a science or technical text,			
		ible and corroborating or challenging conclusions with other			
RST.11-12.9	sources of information.	a ren as af acurra (a a tauta aurarimenta simulations)			
KS1.11-12.9		a range of sources (e.g., texts, experiments, simulations)			
	conflicting information when	g of a process, phenomenon, or concept, resolving			
SL.11-12.4		and supporting evidence clearly, concisely, and logically.			
SL.11-12.4		velopment, and style are appropriate to task, purpose and			
	audience.	verophient, and style are appropriate to task, purpose and			
Interdisciplinary Connect					
6.1.12.HistorySE.14.a		men, racial and ethnic minorities, the LGBTQ community,			
0		and individuals with disabilities have contributed to the American economy, politics and			
	society				
6.1.12.HistorySE.14.b		a diverse perspective to analyze the social, economic and			
-	political contributions of marginalized and underrepresented groups and/or individuals.				
CASEL 5 SEL Framewor	k				
Self-Awareness	-Demonstrate honesty and in	tegrity			
	-Experience self-efficacy				
	-Develop interests and a sense				
Social Awareness	-Recognize strengths in other				
	-Understand and express grat				
Self-Management	-Identify and use stress mana	6 6			
		-Exhibit self-discipline and self-motivation			
	-Use planning and organizati	onal skills			
Relationship Skills	-Communicate effectively				
	-Practice teamwork and colla				
Description (1) Description	-Seek or offer support and he				
Responsible Decision-	-Demonstrate curiosity and o	•			
Making		dgment after analyzing information, data, facts king skills are useful both inside & outside of school			
Unit Essential Question(s)		Unit Enduring Understandings:			
	sets of numbers that make up	 There are different sets of numbers: natural, whole, 			
	sets of numbers that make up				
the number system?	1 1 11 11 10	integers, rational, irrational, and real.			
What are the rules of algebra and how are they used?How are patterns identified and used in real life?		• The number line represents the entire set of			
• How are patterns iden	uned and used in real life?	real numbers.			
		• When opposites are added, the sum is always zero.			
		• The sum of zero and a number is always			
		that number.			
		• To subtract a number, add its opposite.			
		 The product and quotient of two numbers with 			
		the same sign is positive.			
		ule same sign is positive.			

 The quotient and product of two numbers with opposite signs is negative. There is a specific order for performing arithmetic operations. All real numbers can be used in certain pattern called properties: commutative, associativ and distributive. To evaluate a variable expression, replace t variable with a number. Evidence of Learning Formative Assessments: Do Now, Homework, On-spot Checking for Understanding, Teacher Feedback Summative/Benchmark Assessment(s): Quizzes, Chapter Reviews, Chapter Tests Alternative Assessments: Portfolios, Online Assignments					atterns, ciative,		
Resources/Materials: https://njctl.org/materia	ls/courses/algebra-i-6-12		numbers, in Commutati Property	mbe rrati ive I	ry: rs, whole numbers, ir onal numbers, real nu Property, Associative	umbers, opp	oosites,
Lesson Name/Topic	Student Learning C	Suggested P Dbjective(s)	acing Guide	e	Suggested Tasks/A	ctivities:	Day(s) to
The Real Number System	-Defining, classifying numbers, natural num	nbers, integer	rs, rational	s			Complete 2 days
Order of Operations	-Applying order of o	arithmetic expressions and to solve real-world			Lesson, Application	, Review	2 days
Properties of Algebra	-Applying the proper expressions	-Applying the properties of algebra to simplify Lesson, Application, Review			4 days		
Algebraic Expressions	-Evaluating algebraid direct substitution -Writing algebraic ex-	-	by using		Lesson, Application	, Review	2 days
Teacher Notes: 13 tota Additional Resources:	l days including assessm	-	zzes, test)				·
Auditional Resources:		ntiation/Mo	dification St	trate	egies		
Students with Disabilities	English Language Learners		l Talented lents		Students at Risk	504 \$	Students
-Rephrase questions, directions, and explanations -Allow extended time on assessments -Consult with Case Managers and follow IEP modifications/accom modations	-Allow errors in speaking -Rephrase questions, directions, and explanations -Allow extended time on assessments	-Provide ex activities -Build on s intrinsic mo	tudents'	Gu and pro pla -C cla for int -Pr tin	onsult with idance Counselors d follow I&RS ocedures and action ans onsult with assroom teacher(s) r specific behavior rerventions rovide extended ne to complete sks (on need basis)	directions explanation -Allow explanation on assess -Consult Guidance	ons tended time ments with Counselors Committees up with es/504

Unit # 2 - Overview

Content Area: Algebra 1

Unit Title: Equations and Inequalities

Grade Level: 9

Core Ideas: Students will learn the differences and similarities between an expression, an equation, an inequality, and absolute value equations and inequalities. They will be able to solve linear equations and inequalities in one variable by applying inverse operations. They will be able to represent the solution set of a linear equation or an inequality in one variable both algebraically and graphically on a number line. They will learn that the similarities and differences between equations and inequalities are reflected in the use of different symbols, procedures for determining the solution(s), and the type/number of solution(s). They will learn the properties of the absolutes value functions and the uniqueness of its solution set within equations and inequalities. Students will also be able to use linear equations and inequalities in one variable to solve real-life problems.

Standards (Content and Techmology): CPI#: Statement: Performance Expectations (NJSLS) NJSLS.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. NJSLS.A-SSE.A.2 Use the structure of an expression to identify ways to rewrite it. NJSLS.A-CED.A.1 Create equations and inequalities in one variable and use them to solve problems. NJSLS.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. NJSLS.A-CED.A.4 Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. MHP 1 Make sense of problems and persevere in solving them. MP 2 Reason abstractly and quantitatively. MP 3 Construct viable arguments and critique the reasoning of others. MP 5 Use appropriate tools strategically. MP 6 Attend to precision. MP 7 Look for and express regularity in repeated reasoning. Career Readiness, Life Literacices, and Key Skills postecondary plans.		Unit # 2 - Standards
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Cambridge.		Cambridge.

A			
Amistad Law	Explore African-American mathematicians and scientists, including but not limited to		
NJSA 18A:35-4.43	Martha Euphemia Lofton Haynes, the first African-American woman to earn a Ph.D in		
	mathematics, and Elbert Frank Cox, the first African-American man to earn a Ph.D in		
	mathematics in the world.		
	Discuss and analyze the movie <i>Hidden Figures</i> , the story of female African-American		
TT 1 . T	mathematicians and engineers who worked for NASA		
Holocaust Law	Explore Jewish mathematicians using the article "Jewish Mathematicians Who Changed		
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AAPI Law	Explore Asian-American and Pacific Islander mathematicians and scientists, including		
NJSA 18A:25-4.44	but not limited to Dr. Peter Tsai, inventor of the N95 respirator and Diana Ma, data		
Commenter Store de ede	scientist and statistician for the Lakers		
Companion Standards	Translate quantitative or technical information eventeered in mondo in a text into visual		
RST.9-10.7	Translate quantitative or technical information expressed in words in a text into visual		
	form (e.g., a table or chart) and translate information expressed visually or		
RST.11-12.7	mathematically (e.g., in an equation) into words		
R51.11-12.7	Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a		
	problem.		
RST.11-12.8	Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text,		
K31.11-12.0	verifying the data when possible and corroborating or challenging conclusions with other		
	sources of information.		
RST.11-12.9	Synthesize information from a range of sources (e.g., texts, experiments, simulations)		
K51.11 ⁻ 12.7	into a coherent understanding of a process, phenomenon, or concept, resolving		
	conflicting information when possible.		
SL.11-12.4	Present information, findings and supporting evidence clearly, concisely, and logically.		
52.11 12.1	The content, organization, development, and style are appropriate to task, purpose and		
	audience.		
Interdisciplinary Connect			
6.1.12.HistorySE.14.a	Explore the various ways women, racial and ethnic minorities, the LGBTQ community,		
, i i i i i i i i i i i i i i i i i i i	and individuals with disabilities have contributed to the American economy, politics and		
	society		
6.1.12.HistorySE.14.b	Use a variety of sources from diverse perspective to analyze the social, economic and		
	political contributions of marginalized and underrepresented groups and/or individuals.		
CASEL 5 SEL Framewor	'k		
Self-Awareness	-Demonstrate honesty and integrity		
	-Experience self-efficacy		
	-Develop interests and a sense of purpose		
Social Awareness	-Recognize strengths in others		
	-Understand and express gratitude		
Self-Management	-Identify and use stress management strategies		
	-Exhibit self-discipline and self-motivation		
	-Use planning and organizational skills		
Relationship Skills	-Communicate effectively		
	-Practice teamwork and collaborative problem-solving		
	-Seek or offer support and help when needed		
Responsible Decision-	-Demonstrate curiosity and open-mindedness		
Making	-Learn to make a reasoned judgment after analyzing information, data, facts		
	-Recognize how critical thinking skills are useful both inside & outside of school		
Unit Essential Question(s			
	hips between expression • Like terms can be combined.		
and equations?	• An equation is a statement that two numbers		
-	ad inequalities? How are or expressions are equal.		
they solved? How car	• Addition and subtraction are inverse operations.		
nonnocontod?			

represented?

• Multiplication and division are inverse operations.

 How are variables, expressions, equations, inequalities and their solutions used to represent real world phenomena? 		 transla from v extensi formul Simila and ine differe determ of solu The so the var Equations solutions A solutions 	rities and differences between equalities are reflected in the use nt symbols and procedures for ining the solution(s) and the type tion(s). lutions of an equation are the valu- iable that make the equation true ons and inequalities may have on n, infinitely many solutions, or n	d situations odels the eral uations of e/number ues of e. e o yuality
Summative/Benchmar Alternative Assessmen Resources/Materials: https://njctl.org/material	s: Do Now, Homework, On-spot k Assessment(s): Quizzes, Chapte ts: Portfolios, Online Assignment s/courses/algebra-i-6-12/ Suggeste	er Reviews, Chapters s Key Vocabul Expressions, e operations, va d Pacing Guide	er Tests ary: equations, inequalities, like terms riables, absolute value, literal equ	uations
Lesson Name/Topic	Student Learning Objective((s)	Suggested Tasks/Activities:	Day(s) to Complete
Solution Sets and Mathematical Statements	-Identifying the solution set wireplacement set -Writing mathematical statement verbal phrases	-	Lesson, Application, Review	2 days
One and Two-Step Equations	-Solving one and two-step equations by applying order of operations and inverse Lesson, Application, F		Lesson, Application, Review	
		nd inverse		3 days
Multi-Step Equations	-Solving multi-step equations coefficients, including equation	with rational	Lesson, Application, Review	3 days 4 days
Absolute Value	operations -Solving multi-step equations coefficients, including equation on both sides -Solving multi-step absolute v -Graphing the solutions sets of	with rational ns with variables alue equations	Lesson, Application, Review Lesson, Application, Review	
Absolute Value Equations	operations -Solving multi-step equations coefficients, including equation on both sides -Solving multi-step absolute v -Graphing the solutions sets of equations -Solving literal equations or for	with rational ns with variables alue equations f absolute value ormulas for given		4 days
Multi-Step Equations Absolute Value Equations Literal Equations Writing Inequalities	operations -Solving multi-step equations coefficients, including equation on both sides -Solving multi-step absolute v -Graphing the solutions sets of equations	with rational ns with variables alue equations f absolute value ormulas for given formulas	Lesson, Application, Review	4 days 4 days

Absolute Value Inequalities	particular attention to disjunction solution s -Graphing the solution	-Solving absolute value inequalities, paying particular attention to conjunction and disjunction solution sets -Graphing the solution sets on a number line			4 days
Applications of	0	ations, and inequalities to	Lesson, Application	, Review	3 days
Equations and	solve real-life proble	ms			
Inequalities	1 1				
Teacher Notes: 32 tota	l days including assessme	ent days (quizzes, test)			
Additional Resources:					
	Differen	ntiation/Modification St	rategies		
Students with	English Language	Gifted and Talented	Students at Risk	504 S	Students
Disabilities	Learners	Students			
-Rephrase questions, directions, and explanations -Allow extended time on assessments -Consult with Case Managers and follow IEP modifications/accom modations	-Allow errors in speaking -Rephrase questions, directions, and explanations -Allow extended time on assessments	-Provide extension activities -Build on students' intrinsic motivations	-Consult with Guidance Counselors and follow I&RS procedures and action plans -Consult with classroom teacher(s) for specific behavior interventions -Provide extended time to complete tasks (on need basis)	directions explanatio -Allow ex on assess -Consult Guidance	cons tended time ments with Counselors Committees p with es/504

Unit #3 - Overview

Content Area: Algebra 1

Unit Title: Graphing Linear Equations and Functions

Grade Level: 9

Core Ideas: Students will look at how to graph linear equations and the different forms the equations can be written in. Students will also learn how write the equation of a line with given qualities. The relationships between in vertical and horizontal lines, parallel lines, and perpendicular lines will be covered

	Unit # 3 - Standards
Standards (Content and T	echnology):
CPI#:	Statement:
Performance Expectation	ns (NJSLS)
NJSLS.A-CED.A.1	Create equations and inequalities in one variable and use them to solve problems.
NJSLS.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).
NJSLS.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.
NJSLS.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.
Mathematical Practices	
MP 1	Make sense of problems and persevere in solving them.
MP 2	Reason abstractly and quantitatively.
MP 3	Construct viable arguments and critique the reasoning of others.
MP 4	Model with mathematics.
MP 5	Use appropriate tools strategically.
MP 6	Attend to precision.
MP 7	Look for and make use of structure.
MP 8	Look for and express regularity in repeated reasoning.
Career Readiness, Life L	
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9.4.12.CI.1	Demonstrate the ability to reflect, analyze, and use creative skills and ideas
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8.2.12.EC.2	Assess the positive and negative impacts of emerging technologies on developing
	countries and evaluate how individuals, non-profit organizations, and governments have
	responded
	(Amistad, Holocaust, LGBT, etc)
LGBTQ and Disabilities	Explore mathematicians in the LGBTQ and disabled community, including but not
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	scientist and statistician for the Lakers
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	media (e.g., quantitative data, video, multimedia) in order to address a question or solve a
	problem.
RST.11-12.8	Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text,
	verifying the data when possible and corroborating or challenging conclusions with other
	sources of information.
RST.11-12.9	Synthesize information from a range of sources (e.g., texts, experiments, simulations)
	into a coherent understanding of a process, phenomenon, or concept, resolving
	conflicting information when possible.
SL.11-12.4	Present information, findings and supporting evidence clearly, concisely, and logically.
	The content, organization, development, and style are appropriate to task, purpose and
	audience.
Interdisciplinary Connect	
6.1.12.HistorySE.14.a	Explore the various ways women, racial and ethnic minorities, the LGBTQ community,
	and individuals with disabilities have contributed to the American economy, politics and
	society
6.1.12.HistorySE.14.b	Use a variety of sources from diverse perspective to analyze the social, economic and
CASEL SCEL E	political contributions of marginalized and underrepresented groups and/or individuals.
CASEL 5 SEL Framewor	
Self-Awareness	-Demonstrate honesty and integrity -Experience self-efficacy
	-Develop interests and a sense of purpose
Social Awareness	-Recognize strengths in others
Social Awareness	-Understand and express gratitude
Self-Management	-Understand and express grantede -Identify and use stress management strategies
Sen management	-Exhibit self-discipline and self-motivation
	-Use planning and organizational skills
Relationship Skills	-Communicate effectively
F ~	-Practice teamwork and collaborative problem-solving
	-Seek or offer support and help when needed
Responsible Decision-	-Demonstrate curiosity and open-mindedness
Making	-Learn to make a reasoned judgment after analyzing information, data, facts
-	-Recognize how critical thinking skills are useful both inside & outside of school
Unit Essential Question(s)): Unit Enduring Understandings:
• What is meant by the term of ter	he slope of a line?Slope (rate of change)
-	a line's slope help to graph a line? • How to graph a line
-	a line's slope help to find parallel • Know the different forms the equation of a line
and perpendicular 1	
	world situations can be modeled
	• Horizontal and vertical lines
with linear function	
with linear function	
with linear function	• Parallel lines and their slopes
with linear function	Parallel lines and their slopesPerpendicular lines and their slopes
with linear function	• Parallel lines and their slopes

	ts: Portfolios, Online As				
Resources/Materials:		Key Vocab	ulary:		
https://njctl.org/materials/courses/algebra-i-6-12/		slope, interc	cepts, parallel lines, perp	endicular l	ines.
		-	rm of a linear equation, s		
			ion, point-slope form of	-	-
		-		-	
			onstant of variation, one-	-to-one equ	ation,
		function Suggested Pacing Guide			
Lesson Name/Topic	Student Learning O		Suggested Tasks/A	ctivities:	Day(s) to Complete
Plotting Points in a Coordinate Plane	-Identifying and plott plane	ing points in a coordinate	Lesson, Application	, Review	1 day
Graphing Linear Equations	-Graphing linear equa	ations in a coordinate plan	he Lesson, Application	, Review	4 days
Graphing Using	6	ations in a coordinate plan	e Lesson, Application	, Review	3 days
Intercepts	using given intercept	5	~~~		
	-Finding the intercept	s from a given equations			
	-Re-writing the equat	ion of a line in standard			
	form				
Finding Slope and Rate	-Finding the slope of	a line	Lesson, Application	, Review	4 days
of Change	-Interpreting the slop				_
Graphing Using Slope-	-Graphing linear equa	ations in a coordinate plan	ne Lesson, Application	, Review	3 days
Intercept Form	given an equation in slope-intercept form				
	-Identifying the slope	and y-intercept from an			
	equation				
	-Re-writing the equat	ion of a line in slope-			
	intercept form				
Modeling Direct	-Writing and graphin	g direct variation equatior	ns Lesson, Application	, Review	1 day
Variation	-Identifying the const	ant of variation			
Graphing Linear	-Using function notat	ion to write linear	Lesson, Application	, Review	4 days
Functions	functions				
	-Identifying which eq	uations can be classified			
	as functions				
	-Identifying the differ	rence between a function			
	and a one-to-one equ				
Graphing Linear		ualities in two variables	Lesson, Application	, Review	4 days
Inequalities in Two		connection to graphing			
Variables	single-variable inequa	alities			
	days including assessme	ent days (quizzes, test)			
Additional Resources:	Difform	stiation Madification St.	noto at a a		
Students with		ntiation/Modification Stu Gifted and Talented	Students at Risk	504	Students
Disabilities	English Language Learners	Students	Students at KISK	504 (siuuents
Disabilities	Learners	Students			
-Rephrase questions,	-Allow errors in	-Provide extension	-Consult with	-Rephras	e questions,
directions, and	speaking	activities	Guidance Counselors	direction	-
explanations	-Rephrase questions,	-Build on students'	and follow I&RS	explanati	
-Allow extended time	directions, and	intrinsic motivations	procedures and action		xtended time
on assessments	explanations		plans	on assess	
-Consult with Case	-Allow extended time		-Consult with	-Consult	
Managers and follow	on assessments		classroom teacher(s)		Counselors
IEP			(3)		Committees

modifications/accom modations		for specific behavior interventions -Provide extended	to come up with procedures/504 accommodations
		time to complete tasks (on need basis)	

Unit # 4 - Overview

Content Area: Algebra 1

Unit Title: Writing Linear Equations

Grade Level: 9

Core Ideas: Students will work on writing equations of lines in slope-intercept form, given three situations: the slope and y-intercept; the slope and a point; or two points, writing and graphing equations using the slope and a point, using a graph of the line, or using real world data, writing equations of lines in standard form, and using these equations to solve real-world problems, writing and finding equations of lines parallel or perpendicular to a given line. Students will also learn to make scatter plots of data, and use lines of fit and the best-fitting line to model data and to make predictions

	Unit # 4 - Standards
Standards (Content and Tech	nology):
CPI#:	Statement:
Performance Expectations (NJSLS)
NJSLS.F-IF.A.3	Recognize that sequences are functions, sometimes defined recursively, whose domain is
	a subset of the integers.
NJSLS.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. <i>Key features include: intercepts; intervals where the function is increases, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.</i>
NJSLS.F-IF.B.5	Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes.
NJSLS.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.
NJSLS.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.
NJSLS.A-CED.A.1	Create equations and inequalities in one variable and use them to solve problems. <i>Include</i> equations arising from linear and quadratic functions, and simple rational and exponential functions
NJSLS.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
NJSLS.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.
NJSLS.F-BF.A.1	Write a function that describes a relationship between two quantities.
Mathematical Practices	
MP 1	Make sense of problems and persevere in solving them.
MP 2	Reason abstractly and quantitatively.
MP 3	Construct viable arguments and critique the reasoning of others.
MP 4	Model with mathematics.
MP 5	Use appropriate tools strategically.
MP 6	Attend to precision.
MP 7	Look for and make use of structure.
MP 8	Look for and express regularity in repeated reasoning.
Career Readiness, Life Liter	acies, and Key Skills
9.2.12.CAP.5	Assess and modify a personal plan to support current interests and postsecondary plans.
9.4.12.CI.1	Demonstrate the ability to reflect, analyze, and use creative skills and ideas
9.4.12.CI.3	Investigate new challenges and opportunities for personal growth, advancement, and transition
9.4.12.TL.4	Collaborate in online learning communities or social networks or virtual worlds to analyze and propose a resolution to a real-world problems
Computer Science and Desig	
8.1.12.CS.2	Model interactions between application software, system software, and hardware
8.2.12.ITH.3	Analyze the impact that globalization, social media, and access to open source
0.2.12.1111.3	technologies has had on innovation and on a society's economy, politics, and culture

8.2.12.EC.2	Assess the positive and negative impacts of emerging technologies on developing
6.2.12.EC.2	countries and evaluate how individuals, non-profit organizations, and governments have
	responded
Intercultural Statements (Amistad, Holocaust, LGBT, etc)
LGBTQ and Disabilities	Explore mathematicians in the LGBTQ and disabled community, including but not
NJSA 18A:35-4.35	limited to Ron Buckmire, Professor of Mathematics at Occidental College in Los
10011001.55-4.55	Angeles, Emily Riehl, Associate Professor of Mathematics at Johns Hopkins University
	in Baltimore and Stephen Hawking, former Director of Research at the University of
	Cambridge.
Amistad Law	Explore African-American mathematicians and scientists, including but not limited to
NJSA 18A:35-4.43	Martha Euphemia Lofton Haynes, the first African-American woman to earn a Ph.D in
1001101100 1110	mathematics, and Elbert Frank Cox, the first African-American man to earn a Ph.D in
	mathematics in the world.
	Discuss and analyze the movie <i>Hidden Figures</i> , the story of female African-American
	mathematicians and engineers who worked for NASA
Holocaust Law	Explore Jewish mathematicians using the article "Jewish Mathematicians Who Changed
NJSA 18A:35-28	the Course of History" from jewishjournal.com
AAPI Law	Explore Asian-American and Pacific Islander mathematicians and scientists, including
NJSA 18A:25-4.44	but not limited to Dr. Peter Tsai, inventor of the N95 respirator and Diana Ma, data
	scientist and statistician for the Lakers
Companion Standards	
RST.9-10.7	Translate quantitative or technical information expressed in words in a text into visual
	form (e.g., a table or chart) and translate information expressed visually or
	mathematically (e.g., in an equation) into words
RST.11-12.7	Integrate and evaluate multiple sources of information presented in diverse formats and
	media (e.g., quantitative data, video, multimedia) in order to address a question or solve a
	problem.
RST.11-12.8	Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text,
	verifying the data when possible and corroborating or challenging conclusions with other
	sources of information.
RST.11-12.9	Synthesize information from a range of sources (e.g., texts, experiments, simulations)
	into a coherent understanding of a process, phenomenon, or concept, resolving
	conflicting information when possible.
SL.11-12.4	Present information, findings and supporting evidence clearly, concisely, and logically.
	The content, organization, development, and style are appropriate to task, purpose and
	audience.
Interdisciplinary Connecti	
6.1.12.HistorySE.14.a	Explore the various ways women, racial and ethnic minorities, the LGBTQ community,
	and individuals with disabilities have contributed to the American economy, politics and
6.1.12.HistorySE.14.b	society Use a variety of sources from diverse perspective to analyze the social, economic and
0.1.12.HIStOLYSE.14.0	political contributions of marginalized and underrepresented groups and/or individuals.
CASEL 5 SEL Frameworl	
Self-Awareness	-Demonstrate honesty and integrity
Sell-Awareness	-Experience self-efficacy
	-Develop interests and a sense of purpose
Social Awareness	-Recognize strengths in others
	-Understand and express gratitude
Self-Management	-Identify and use stress management strategies
Son munugement	-Exhibit self-discipline and self-motivation
	-Use planning and organizational skills
Relationship Skills	-Communicate effectively
p =	-Practice teamwork and collaborative problem-solving
	-Seek or offer support and help when needed
	· · ··································

Responsible Decision-	-Demonstrate curiosity and open-mindedness					
Making	-Learn to make a reasoned judgment after analyzing information, data, facts					
	-Recognize how critical thinking skills are useful both inside & outside of school					nool
 Unit Essential Question(s): How can equations of lines be used to solve real world problems? How can models of data be used to make predictions? What role does slope play in real-word problems? 				uring Understandings: e a word problem, identi ram. e an equation, solve the problem.	: fy a variabl	e, draw a
Formative Assessments Summative/Benchmark Alternative Assessment	Assessment(s): Quizze	es, Chapter Rev	king for Un		edback	
Resources/Materials:]	Key Vocab	ularv:		
https://njctl.org/materials		۷ ا	inear mode	ls, slope-intercept form,	point-slope	e forms
Lesson Name/Topic	Student Learning O	Suggested Pac Dbjective(s)	cing Guide	Suggested Tasks/A	Activities:	Day(s) to Complete
Writing and Using Linear Equations in Slope-Intercept Form	form given two point	-Writing equations of lines in slope-intercept form given two points -Writing equations of lines in slope-intercept form given the slope and a point			Lesson, Application, Review	
Writing Linear Equation in Point-Slope Form	given two points	-Writing equations of line in point-slope form given two points -Writing equations of lines in point-slope form			n, Review	3 days
Writing Linear Equations in Standard Form	-Writing equations of given two points	-Writing equations of lines in standard form given two points -Writing equations of lines in standard form			n, Review	3 days
Writing Equations of Parallel and Perpendicular Lines	-Writing equations of lines given a descript -Writing equations of	-Writing equations of parallel and perpendicular lines given a description of characteristics -Writing equations of parallel and perpendicular			n, Review	2 days
Fitting a Line to Data	-Drawing scatter plot -Identifying the line of	-Identifying the line of best fit -Writing the equation of the line of best fit to			n, Review	1 day
Predicting with Linear Models				Lesson, Application	n, Review	1 day
Teacher Notes: 17 total	days including assessme	ent days (quizz	es, test)			
Additional Resources:						
Students with Disabilities	Differe English Language Learners				504 \$	Students
directions, and explanations -Allow extended time	-Allow errors in speaking -Rephrase questions, directions, and explanations	-Provide exte activities -Build on stu intrinsic moti	dents'	-Consult with Guidance Counselors and follow I&RS procedures and action plans	directions	ons ktended time

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-Consult with Case	-Allow extended time	-Consult with	-Consult with
Managers and follow	on assessments	classroom teacher(s)	Guidance Counselors
IEP		for specific behavior	and 504 Committees
modifications/accom		interventions	to come up with
modations		-Provide extended	procedures/504
		time to complete tasks	accommodations
		(on need basis)	

Unit # 5 - Overview

Content Area: Algebra 1

Unit Title: Systems of Equations and Inequalities

Grade Level: 9

Core Ideas: Students will use graphing, substitution, and elimination to solve systems of linear equations. In this unit students will also identify linear systems as having one solution, no solution, or infinitely many solutions. Solving systems of linear inequalities will also be covered.

of finear inequalities will also	Unit # 5 - Standards
Standards (Content and Tech	
CPI#:	Statement:
Performance Expectations (NJSLS)
NJSLS.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.
NJSLS.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 model context.
NJSLS.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.
NJSLS.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.
NJSLS.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 equations $f(x)=g(x)$; 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.
NJSLS.A-REI.D.12	Graph the solution 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.
NJSLS.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.
Mathematical Practices	
MP 1	Make sense of problems and persevere in solving them.
MP 2	Reason abstractly and quantitatively.
MP 3	Construct viable arguments and critique the reasoning of others.
MP 4	Model with mathematics.
MP 5	Use appropriate tools strategically.
MP 6	Attend to precision.
MP 7	Look for and make use of structure.
MP 8	Look for and express regularity in repeated reasoning.
Career Readiness, Life Liter	
9.2.12.CAP.5	Assess and modify a personal plan to support current interests and postsecondary plans.
9.4.12.CI.1	Demonstrate the ability to reflect, analyze, and use creative skills and ideas
9.4.12.CI.3	Investigate new challenges and opportunities for personal growth, advancement, and
	transition
9.4.12.TL.4	Collaborate in online learning communities or social networks or virtual worlds to
	analyze and propose a resolution to a real-world problems
Computer Science and Desig	
8.1.12.CS.2	Model interactions between application software, system software, and hardware
8.2.12.ITH.3	Analyze the impact that globalization, social media, and access to open source
	technologies has had on innovation and on a society's economy, politics, and culture
8.2.12.EC.2	Assess the positive and negative impacts of emerging technologies on developing
	countries and evaluate how individuals, non-profit organizations, and governments have
	responded
Intercultural Statements (A)	mistad, Holocaust, LGBT, etc)

LGBTQ and Disabilities	Explore mathematicians in the LGBTQ and disabled community, including but not			
NJSA 18A:35-4.35	limited to Ron Buckmire, Professor of Mathematics at Occidental College in Los			
	Angeles, Emily Riehl, Associate Professor of Mathematics at Johns Hopkins University			
	in Baltimore and Stephen Hawking, former Director of Research at the University of			
	Cambridge.			
Amistad Law	Explore African-American mathematicians and scientists, including but not limited to			
NJSA 18A:35-4.43	Martha Euphemia Lofton Haynes, the first African-American woman to earn a Ph.D in			
	mathematics, and Elbert Frank Cox, the first African-American man to earn a Ph.D in			
	mathematics in the world.			
	Discuss and analyze the movie <i>Hidden Figures</i> , the story of female African-American			
	mathematicians and engineers who worked for NASA			
Holocaust Law	Explore Jewish mathematicians using the article "Jewish Mathematicians Who Changed			
NJSA 18A:35-28	the Course of History" from jewishjournal.com			
AAPI Law	Explore Asian-American and Pacific Islander mathematicians and scientists, including			
NJSA 18A:25-4.44	but not limited to Dr. Peter Tsai, inventor of the N95 respirator and Diana Ma, data			
	scientist and statistician for the Lakers			
Companion Standards				
RST.9-10.7	Translate quantitative or technical information expressed in words in a text into visual			
	form (e.g., a table or chart) and translate information expressed visually or			
	mathematically (e.g., in an equation) into words			
RST.11-12.7	Integrate and evaluate multiple sources of information presented in diverse formats and			
	media (e.g., quantitative data, video, multimedia) in order to address a question or solve a			
	problem.			
RST.11-12.8	Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text,			
NG1.11 12.0	verifying the data when possible and corroborating or challenging conclusions with other			
	sources of information.			
RST.11-12.9	Sources of information. Synthesize information from a range of sources (e.g., texts, experiments, simulations)			
NOT.11 12.9	into a coherent understanding of a process, phenomenon, or concept, resolving			
	conflicting information when possible.			
SL.11-12.4	Present information, findings and supporting evidence clearly, concisely, and logically.			
SL.11-12.4	The content, organization, development, and style are appropriate to task, purpose and			
	audience.			
Interdisciplinary Connect				
6.1.12.HistorySE.14.a	Explore the various ways women, racial and ethnic minorities, the LGBTQ community,			
0.1.12.1113tory5L.14.a	and individuals with disabilities have contributed to the American economy, politics and			
	society			
6.1.12.HistorySE.14.b	Use a variety of sources from diverse perspective to analyze the social, economic and			
0.1.12.111story3E.14.0	political contributions of marginalized and underrepresented groups and/or individuals.			
CASEL 5 SEL Framework				
Self-Awareness				
Sell-Awareness	-Demonstrate honesty and integrity -Experience self-efficacy			
Social Awaranaga	-Develop interests and a sense of purpose			
Social Awareness	-Recognize strengths in others			
C-16 Maria	-Understand and express gratitude			
Self-Management	-Identify and use stress management strategies			
	-Exhibit self-discipline and self-motivation			
D 1 11	-Use planning and organizational skills			
Relationship Skills	-Communicate effectively			
	-Practice teamwork and collaborative problem-solving			
D 11 D 11	-Seek or offer support and help when needed			
Responsible Decision-	-Demonstrate curiosity and open-mindedness			
Making	-Learn to make a reasoned judgment after analyzing information, data, facts			
	-Recognize how critical thinking skills are useful both inside & outside of school			
Unit Essential Question(s)				
 How can real world sit 	tuations be modeled by systems? • The point at which lines intersect is the solution			

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	be found to a system? on to a system represent?	•]	the system with those line that the overlap of the half nequalities is the solution s	planes of a s	•
Summative/Benchmar	s: Do Now, Homework, k Assessment(s): Quizze ts: Portfolios, Online As	On-spot Checking for es, Chapter Reviews, C	Understanding, Teacher Fe	eedback	
Resources/Materials: https://njctl.org/materia	ls/courses/algebra-i-6-12,	System solution	cabulary: of equations, substitution, e s, point of intersection	limination,	infinite
Lesson Name/Topic	Student Learning O	Suggested Pacing Gu bjective(s)	Suggested Tasks/A	Activities:	Day(s) to Complete
Solving Linear Systems by Graphing		t of intersections both	Lesson, Application	n, Review	4 days
Solving Linear Systems by Substitution	-Solving systems of 1 substituting	-Solving systems of linear equations by			4 days
Solving Linear Systems by Adding or Subtracting		-Solving systems of linear equations using elimination by way of addition or subtraction			3 days
Solving Linear Systems by Multiplying First		-Solving systems of linear equations using elimination but first multiplying by constants			4 days
Solving Special Types of Linear Systems	-Identifying the num system	-Identifying the number of solutions of a linearIsystem-Distinguishing between infinite solutions and			2 days
Solving Systems of Linear Inequalities	-Graphing systems of -Identifying the solut coordinate grid		Lesson, Application	n, Review	4 days
Teacher Notes: 24 tota Additional Resources:	l days including assessme	ent days (quizzes, test)			-
Aduitional Resources.	Differe	ntiation/Modification	Strategies		
Students with Disabilities	English Language Learners	Gifted and Talente Students	d Students at Risk	504 \$	Students
-Rephrase questions, directions, and explanations -Allow extended time on assessments -Consult with Case Managers and follow IEP modifications/accom modations	-Allow errors in speaking -Rephrase questions, directions, and explanations -Allow extended time on assessments	-Provide extension activities -Build on students' intrinsic motivations	 -Consult with Guidance Counselors and follow I&RS procedures and action plans -Consult with classroom teacher(s) for specific behavior interventions -Provide extended time to complete tasks (on need basis) 	directions explanati -Allow ex on assess -Consult Guidance	ons xtended time ments with c Counselors Committees up with es/504

Unit # 6 - Overview

Content Area: Algebra 1

Unit Title: Exponents and Exponential Functions

Grade Level: 9

Core Ideas: Students will examine the uses of the properties of exponents involving products and quotients. Students will apply the product of powers property, the power of a power property, the power of a product property, the quotient of powers property, and the power of a quotient property. Students will also use zero and negative exponents, scientific notation, and will write and graph rules for exponential functions, including exponential growth and decay.

	Unit # 6 - Standards
Standards (Content and Tec	chnology):
CPI#:	Statement:
Performance Expectations	
NJSLS.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
NJSLS.A-SSE.B.3c	Use the properties of exponents to transform expressions for exponential functions.
Mathematical Practices	
MP 1	Make sense of problems and persevere in solving them.
MP 2	Reason abstractly and quantitatively.
MP 3	Construct viable arguments and critique the reasoning of others.
MP 4	Model with mathematics.
MP 5	Use appropriate tools strategically.
MP 6	Attend to precision.
MP 7	Look for and make use of structure.
MP 8	Look for and express regularity in repeated reasoning.
Career Readiness, Life Lit	eracies, and Key Skills
9.1.12.CDM.8	Compare and compute interest and compound interest
9.1.12.PB.6	Describe and calculate interest and fees that are applied to various forms of spending,
	debt and saving
9.2.12.CAP.5	Assess and modify a personal plan to support current interests and postsecondary plans.
9.4.12.CI.1	Demonstrate the ability to reflect, analyze, and use creative skills and ideas
9.4.12.CI.3	Investigate new challenges and opportunities for personal growth, advancement, and
	transition
9.4.12.TL.4	Collaborate in online learning communities or social networks or virtual worlds to
	analyze and propose a resolution to a real-world problems
Computer Science and Des	sign Thinking
8.1.12.CS.2	Model interactions between application software, system software, and hardware
8.2.12.ITH.3	Analyze the impact that globalization, social media, and access to open source
	technologies has had on innovation and on a society's economy, politics, and culture
8.2.12.EC.2	Assess the positive and negative impacts of emerging technologies on developing
	countries and evaluate how individuals, non-profit organizations, and governments have
	responded
	Amistad, Holocaust, LGBT, etc)
LGBTQ and Disabilities	Explore mathematicians in the LGBTQ and disabled community, including but not
NJSA 18A:35-4.35	limited to Ron Buckmire, Professor of Mathematics at Occidental College in Los
	Angeles, Emily Riehl, Associate Professor of Mathematics at Johns Hopkins University
	in Baltimore and Stephen Hawking, former Director of Research at the University of
	Cambridge.
Amistad Law	Explore African-American mathematicians and scientists, including but not limited to
NJSA 18A:35-4.43	Martha Euphemia Lofton Haynes, the first African-American woman to earn a Ph.D in
	mathematics, and Elbert Frank Cox, the first African-American man to earn a Ph.D in
	mathematics in the world.
	Discuss and analyze the movie <i>Hidden Figures</i> , the story of female African-American
	mathematicians and engineers who worked for NASA

Holocaust Law	Explore Jewish mathematicians using the article "Jewish Mathematicians Who Changed			
NJSA 18A:35-28	the Course of History" from jewishjournal.com			
AAPI Law	Explore Asian-American and Pacific Islander mathematicians and scientists, including			
NJSA 18A:25-4.44	but not limited to Dr. Peter Tsai, inventor of the N95 respirator and Diana Ma, data			
	scientist and statistician for the Lakers			
Companion Standards				
RST.9-10.7	Translate quantitative or technical information expressed in words in a text into visual			
	form (e.g., a table or chart) and translate information expressed visually or			
	mathematically (e.g., in an equation) into words			
RST.11-12.7	Integrate and evaluate multiple sources of information presented in diverse formats and			
	media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.			
RST.11-12.8	Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text,			
	verifying the data when possible and corroborating or challenging conclusions with other			
	sources of information.			
RST.11-12.9	Synthesize information from a range of sources (e.g., texts, experiments, simulations)			
	into a coherent understanding of a process, phenomenon, or concept, resolving			
<u></u>	conflicting information when possible.			
SL.11-12.4	Present information, findings and supporting evidence clearly, concisely, and logically.			
	The content, organization, development, and style are appropriate to task, purpose and			
	audience.			
Interdisciplinary Connection 6.1.12.HistorySE.14.a				
0.1.12.HIStorySE.14.a	Explore the various ways women, racial and ethnic minorities, the LGBTQ community, and individuals with disabilities have contributed to the American economy, politics and			
	society			
6.1.12.HistorySE.14.b	Use a variety of sources from diverse perspective to analyze the social, economic and			
0.1.12.11.15.019.02.11.10	political contributions of marginalized and underrepresented groups and/or individuals.			
CASEL 5 SEL Framework				
Self-Awareness	-Demonstrate honesty and integrity			
	-Experience self-efficacy			
	-Develop interests and a sense of purpose			
Social Awareness	-Recognize strengths in others			
	-Understand and express gratitude			
Self-Management	-Identify and use stress management strategies			
	-Exhibit self-discipline and self-motivation			
	-Use planning and organizational skills			
Relationship Skills	-Communicate effectively			
	-Practice teamwork and collaborative problem-solving			
Responsible Decision-	-Seek or offer support and help when needed -Demonstrate curiosity and open-mindedness			
Making	-Learn to make a reasoned judgment after analyzing information, data, facts			
Making	-Recognize how critical thinking skills are useful both inside & outside of school			
Unit Essential Question(s):	Unit Enduring Understandings:			
 How can we apply proper 	0 0			
simplify expressions?	product properties.			
	raph exponential functions? • Understand the rules for exponents.			
- now can we write and g	• Understand the rules for exponential growth and			
	• Onderstand what exponential growth and exponential decay is.			
	 Understand the difference between growth/decay 			
	rates and growth/decay factors.			
	Evidence of Learning			
Formative Assessments: Do	Now, Homework, On-spot Checking for Understanding Teacher Feedback			
	Now, Homework, On-spot Checking for Understanding, Teacher Feedback Sessment(s): Quizzes, Chapter Reviews, Chapter Tests			

Resources/Materials: https://njctl.org/materials/courses/algebra-i-6-12/			-	Dulary: nent, exponential growth, ay rates, growth/decay fa	-	al decay,
		Suggested Pac				
Lesson Name/Topic	Student Learning O	00	ing Guide	Suggested Tasks/A	ctivities:	Day(s) to Complete
Applying Exponent Properties Involving Products	simplify expressions	-Using the product property of exponents to simplify expressions -Extend the property to multiple bases			, Review	4 days
Applying Exponent Properties Involving Quotients	-Using the quotient p simplify expressions -Extend the property	property of expo	onents to	Lesson, Application	, Review	4 days
Defining and Using Zero and Negative Exponents	expressions	-Using the zero exponent property to simplify expressions -Using the negative exponent property toLet 			, Review	4 days
Writing and Graphing Exponential Growth Functions		-Identifying and graphing exponential growth -Identifying growth rates and factors			, Review	3 days
Writing and Graphing Exponential Decay Functions	-Identifying decay ra	-Identifying and graphing exponential decay -Identifying decay rates and factors		Lesson, Application	, Review	3 days
	l days including assessme	ent days (quizz	es, test)			
Additional Resources:			» ··· · · · · · · · · · · · · · · · · ·			
Students with Disabilities	English Language Learners	ntiation/Modif Gifted and T Studer	Falented	Students at Risk	504 \$	Students
-Rephrase questions, directions, and explanations -Allow extended time on assessments -Consult with Case Managers and follow IEP modifications/accom modations	-Allow errors in speaking -Rephrase questions, directions, and explanations -Allow extended time on assessments	-Provide exte activities -Build on stud intrinsic moti	dents'	-Consult with Guidance Counselors and follow I&RS procedures and action plans -Consult with classroom teacher(s) for specific behavior interventions -Provide extended time to complete tasks (on need basis)	directions explanati -Allow ex on assess -Consult Guidance	ons ktended time ments with c Counselors Committees up with es/504

Unit #7 - Overview

Content Area: Algebra 1

Unit Title: Polynomials and Factoring

Grade Level: 9

Core Ideas: Students will explore the operations that can be done with polynomials. They will define, classify, add, subtract, and multiply polynomial expressions. Students will use the distributive property to find products and patterns, including the FOIL pattern, the square of a binomial pattern, and the sum and difference patterns. Students will use polynomials to describe and solve real world problems, as well as solve polynomial equations. They will factor polynomials in order to solve equations, to find zeros of functions, and to find the roots of equations.

	Unit # 7 - Standards
Standards (Content and Te	
CPI#:	Statement:
Performance Expectations	
NJSLS.A-SSE.A.2	Use the structure of an expression to identify ways to rewrite it.
NJSLS.A-SSE.B.3a	Factor a quadratic expression to reveal the zeros of the function it defines.
NJSLS.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
NJSLS.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.
NJSLS.A-REI.B.4b	Solve quadratic equations in one variable.
	b. Solve quadratic equations by inspection, 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.
Mathematical Practices	
MP 1	Make sense of problems and persevere in solving them.
MP 2	Reason abstractly and quantitatively.
MP 3	Construct viable arguments and critique the reasoning of others.
MP 4	Model with mathematics.
MP 5	Use appropriate tools strategically.
MP 6	Attend to precision.
MP 7	Look for and make use of structure.
MP 8	Look for and express regularity in repeated reasoning.
Career Readiness, Life Lit	teracies, and Key Skills
9.2.12.CAP.5	Assess and modify a personal plan to support current interests and postsecondary plans.
9.4.12.CI.1	Demonstrate the ability to reflect, analyze, and use creative skills and ideas
9.4.12.CI.3	Investigate new challenges and opportunities for personal growth, advancement, and
	transition
9.4.12.TL.4	Collaborate in online learning communities or social networks or virtual worlds to
	analyze and propose a resolution to a real-world problems
Computer Science and De	sign Thinking
8.1.12.CS.2	Model interactions between application software, system software, and hardware
8.2.12.ITH.3	Analyze the impact that globalization, social media, and access to open source
	technologies has had on innovation and on a society's economy, politics, and culture
8.2.12.EC.2	Assess the positive and negative impacts of emerging technologies on developing
	countries and evaluate how individuals, non-profit organizations, and governments have
	responded
	Amistad, Holocaust, LGBT, etc)
LGBTQ and Disabilities	Explore mathematicians in the LGBTQ and disabled community, including but not
NJSA 18A:35-4.35	limited to Ron Buckmire, Professor of Mathematics at Occidental College in Los
	Angeles, Emily Riehl, Associate Professor of Mathematics at Johns Hopkins University
	in Baltimore and Stephen Hawking, former Director of Research at the University of
	Cambridge.

Amistad Law	Explore African-American mathematicians and scientists, including but not limited to			
NJSA 18A:35-4.43	Martha Euphemia Lofton Haynes, the first African-American woman to earn a Ph.D in			
1135711071.55-4.45	mathematics, and Elbert Frank Cox, the first African-American man to earn a Ph.D in			
	mathematics in the world.			
	Discuss and analyze the movie <i>Hidden Figures</i> , the story of female African-American			
	mathematicians and engineers who worked for NASA			
Holocaust Law	Explore Jewish mathematicians using the article "Jewish Mathematicians Who Changed			
NJSA 18A:35-28	the Course of History" from jewishjournal.com			
AAPI Law	Explore Asian-American and Pacific Islander mathematicians and scientists, including			
NJSA 18A:25-4.44	but not limited to Dr. Peter Tsai, inventor of the N95 respirator and Diana Ma, data			
	scientist and statistician for the Lakers			
Companion Standards				
RST.9-10.7	Translate quantitative or technical information expressed in words in a text into visual			
	form (e.g., a table or chart) and translate information expressed visually or			
	mathematically (e.g., in an equation) into words			
RST.11-12.7	Integrate and evaluate multiple sources of information presented in diverse formats and			
	media (e.g., quantitative data, video, multimedia) in order to address a question or solve a			
	problem.			
RST.11-12.8	Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text,			
	verifying the data when possible and corroborating or challenging conclusions with other			
	sources of information.			
RST.11-12.9	Synthesize information from a range of sources (e.g., texts, experiments, simulations)			
	into a coherent understanding of a process, phenomenon, or concept, resolving			
	conflicting information when possible.			
SL.11-12.4	Present information, findings and supporting evidence clearly, concisely, and logically.			
	The content, organization, development, and style are appropriate to task, purpose and			
	audience.			
Interdisciplinary Connect				
6.1.12.HistorySE.14.a	Explore the various ways women, racial and ethnic minorities, the LGBTQ community,			
	and individuals with disabilities have contributed to the American economy, politics and society			
6.1.12.HistorySE.14.b	Use a variety of sources from diverse perspective to analyze the social, economic and			
0.1.12.111story5E.14.0	political contributions of marginalized and underrepresented groups and/or individuals.			
CASEL 5 SEL Framewor				
Self-Awareness	-Demonstrate honesty and integrity			
Sell-Awareness	-Experience self-efficacy			
	-Experience sen-enfracy -Develop interests and a sense of purpose			
Social Awareness	-Recognize strengths in others			
	-Understand and express gratitude			
Self-Management	-Identify and use stress management strategies			
Son Management	-Exhibit self-discipline and self-motivation			
	-Use planning and organizational skills			
Relationship Skills	-Communicate effectively			
	-Practice teamwork and collaborative problem-solving			
	-Seek or offer support and help when needed			
Responsible Decision-	-Demonstrate curiosity and open-mindedness			
Making	-Learn to make a reasoned judgment after analyzing information, data, facts			
	-Recognize how critical thinking skills are useful both inside & outside of school			
Unit Essential Question(s				
• What is a polynomial				
	the feature is news			
-				
simplify polynomial e	an he combined			
• How are polynomials	applied to real-life situations?			

- How are polynomials applied to real-life situations? •
- To multiply polynomials, each term of one • How is mathematical language use to describe a •

nonlinear change? Formative Assessments Summative/Benchmar		Evidence of Learning On-spot Checking for U	Inderstanding, Teac	vay or rewriting a ant, linear, and no specific characte	polynomial. onlinear
Alternative Assessmen Resources/Materials: https://njctl.org/material	ts: Portfolios, Online As	Signments Key Voca Polynomi	-		•
		· ·	erfect square trinon		
Lesson Name/Topic	Student Learning O	Suggested Pacing Guio bjective(s)	Suggested		Day(s) to
Classifying Polynomials	monomial, binomial, polynomials	he terms polynomial, and trinomial to classif f a polynomial and writ	y	i ties: lication, Review	Complete 1 day
Add and Subtract Polynomials	-Adding and subtract			lication, Review	2 days
Multiply Polynomials	-Multiplying polynor	nials using the distribut	ve Lesson, Appl	lication, Review	4 days
Special Products of Polynomials	within multiplication	gnizing special patterns of polynomials, includi squares and perfect squ	ng	lication, Review	2 days
Factoring Quadratic Expressions	-Factoring quadratic	expressions, recognizing thods when the trinomia		lication, Review	6 days
Factoring Special Products	-Identifying and reco when factoring polyn	-Identifying and recognizing special patterns when factoring polynomials, including the difference of two squares and perfect square			
Factoring Polynomials Completely	-Factoring polynomia first and then factoring		Lesson, Appl	ication, Review	4 days
	days including assessme	ent days (quizzes, test)			
Additional Resources:					
Students with	English Language	ntiation/Modification S Gifted and Talented	Strategies Students at R	isk 504	Students
Disabilities	Learners	Students			
-Rephrase questions, directions, and explanations -Allow extended time on assessments	-Allow errors in speaking -Rephrase questions, directions, and explanations	-Provide extension activities -Build on students' intrinsic motivations	-Consult with Guidance Couns and follow I&RS procedures and a plans	elors direction S explanat	ions extended time

Midland Park Public Schools

-Consult with Case	-Allow extended time	-Consult with	-Consult with
Managers and follow	on assessments	classroom teacher(s)	Guidance Counselors
IEP		for specific behavior	and 504 Committees
modifications/accom		interventions	to come up with
modations		-Provide extended	procedures/504
		time to complete tasks	accommodations
		(on need basis)	

Unit #8 - Overview

Content Area: Algebra 1

Unit Title: Quadratic Equations and Functions

Grade Level: 9

Core Ideas: Students will compare and contrast quadratic equations and the parent function. They will look at a graph of a quadratic functions and recognize the axis of symmetry, the vertex, and minimum/maximum values. Students will solve quadratic equations by factoring, graphing, using square roots, and using the quadratic formula. They will use the discriminant to determine the number and type of solutions of a quadratic equation. Students will be able to present linear, exponential, and quadratic expressions as models for different sets/types of data.

exponential, and quadratic	Linit # 2 Stondords
Standards (Content and T	Unit # 8 - Standards
CPI#:	
	Statement:
Performance Expectation NJSLS.A-CED.A.2	
NJSLS.A-CED.A.2	Create equations in two or more variables to represent relationships between quantities;
NICLC A DELD 41	graph equations on coordinate axes with labels and scales.
NJSLS.A-REI.B.4b	Solve quadratic equations by inspection, 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.
NJSLS.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 equations $f(x)=g(x)$; 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.
NJSLS.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. <i>Key features include: intercepts; intervals where the function is increases, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.</i>
NJSLS.F-IF.C.7a	Graphing linear and quadratic functions and show intercepts, maxima, and minima.
NJSLS.F-BF.B.3	Identify the effect on the graph by replacing $f(x)$ by $f(x)+k$, $kf(x)$, $f(kh)$, $f(x+h)$ 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. <i>Include recognizing even and odd functions from their graphs and algebraic expressions for them.</i>
Mathematical Practices	
MP 1	Make sense of problems and persevere in solving them.
MP 2	Reason abstractly and quantitatively.
MP 3	Construct viable arguments and critique the reasoning of others.
MP 4	Model with mathematics.
MP 5	Use appropriate tools strategically.
MP 6	Attend to precision.
MP 7	Look for and make use of structure.
MP 8	Look for and express regularity in repeated reasoning.
Career Readiness, Life L	
9.2.12.CAP.5	Assess and modify a personal plan to support current interests and postsecondary plans.
9.4.12.CI.1	Demonstrate the ability to reflect, analyze, and use creative skills and ideas
9.4.12.CI.3	Investigate new challenges and opportunities for personal growth, advancement, and transition
9.4.12.TL.4	Collaborate in online learning communities or social networks or virtual worlds to analyze and propose a resolution to a real-world problems
Computer Science and D	esign Thinking
8.1.12.CS.2	Model interactions between application software, system software, and hardware
8.2.12.ITH.3	Analyze the impact that globalization, social media, and access to open source technologies has had on innovation and on a society's economy, politics, and culture

8.2.12.EC.2	Assess the positive and negative impacts of emerging technologies on developing
0.2.12.LC.2	countries and evaluate how individuals, non-profit organizations, and governments have
	responded
Intercultural Statements ((Amistad, Holocaust, LGBT, etc)
LGBTQ and Disabilities	Explore mathematicians in the LGBTQ and disabled community, including but not
NJSA 18A:35-4.35	limited to Ron Buckmire, Professor of Mathematics at Occidental College in Los
	Angeles, Emily Riehl, Associate Professor of Mathematics at Johns Hopkins University
	in Baltimore and Stephen Hawking, former Director of Research at the University of
	Cambridge.
Amistad Law	Explore African-American mathematicians and scientists, including but not limited to
NJSA 18A:35-4.43	Martha Euphemia Lofton Haynes, the first African-American woman to earn a Ph.D in
	mathematics, and Elbert Frank Cox, the first African-American man to earn a Ph.D in
	mathematics in the world.
	Discuss and analyze the movie <i>Hidden Figures</i> , the story of female African-American
	mathematicians and engineers who worked for NASA
Holocaust Law	Explore Jewish mathematicians using the article "Jewish Mathematicians Who Changed
NJSA 18A:35-28	the Course of History" from jewishjournal.com
AAPI Law	Explore Asian-American and Pacific Islander mathematicians and scientists, including
NJSA 18A:25-4.44	but not limited to Dr. Peter Tsai, inventor of the N95 respirator and Diana Ma, data
	scientist and statistician for the Lakers
Companion Standards	
RST.9-10.7	Translate quantitative or technical information expressed in words in a text into visual
	form (e.g., a table or chart) and translate information expressed visually or
	mathematically (e.g., in an equation) into words
RST.11-12.7	Integrate and evaluate multiple sources of information presented in diverse formats and
	media (e.g., quantitative data, video, multimedia) in order to address a question or solve a
	problem.
RST.11-12.8	Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text,
	verifying the data when possible and corroborating or challenging conclusions with other
DCT 11 12 0	sources of information.
RST.11-12.9	Synthesize information from a range of sources (e.g., texts, experiments, simulations)
	into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.
SL.11-12.4	Present information, findings and supporting evidence clearly, concisely, and logically.
SL.11-12.4	The content, organization, development, and style are appropriate to task, purpose and
	audience.
Interdisciplinary Connect	
6.1.12.HistorySE.14.a	Explore the various ways women, racial and ethnic minorities, the LGBTQ community,
0.1.12.111story5L.14.a	and individuals with disabilities have contributed to the American economy, politics and
	society
6.1.12.HistorySE.14.b	Use a variety of sources from diverse perspective to analyze the social, economic and
····	political contributions of marginalized and underrepresented groups and/or individuals.
CASEL 5 SEL Framewor	
Self-Awareness	-Demonstrate honesty and integrity
	-Experience self-efficacy
	-Develop interests and a sense of purpose
Social Awareness	-Recognize strengths in others
	-Understand and express gratitude
Self-Management	-Identify and use stress management strategies
-	-Exhibit self-discipline and self-motivation
	-Use planning and organizational skills
Relationship Skills	-Communicate effectively
	-Practice teamwork and collaborative problem-solving
	-Seek or offer support and help when needed

Responsible Decision-	-Demonstrate curiosity and open-mindedness			
Making	-Learn to make a reasoned judgment after analyzing information, data, facts			
	-Recognize how critical thinking skills are useful both inside & outside of school			hool
Unit Essential Question			ing Understandings:	
• How do we solve quadratic equations?			how to graph quadratic functions	
• How do we solve systems with quadratic equations?		Compa	re quadratic functions to the pare	ent graph.
• How can we compare linear, exponential, and		• Find th	e axis of symmetry, the vertex, a	nd
quadratic models?		minimu	and maximum values.	
• How do we model re	elationships?	• Solve c	juadratic equations by factoring,	graphing,
			quare roots, and using the quadra	
		formula		
		Determ	ine number and type of solutions	sof
			ratic equation.	, 01
		-	ine whether a linear, exponentia	1
			· ·	
		-	lratic function best models a set of	01
		data.		
		of Learning		
	Do Now, Homework, On-spot Ch			
	Assessment(s): Quizzes, Chapter I	Reviews, Chapte	r Tests	
Alternative Assessments	: Portfolios, Online Assignments			
Resources/Materials:		Key Vocabulary:		
https://njctl.org/materials/courses/algebra-i-6-12/		axis of symmetry, vertex, maximum, minimum, parabola,		
		-	Quadratic Formula	-
	Suggested I	Pacing Guide		
Lesson Name/Topic	Student Learning Objective(s)		Suggested Tasks/Activities:	Day(s) to Complete
Graphing Quadratic	-Graphing quadratic equations by	using a table	Lesson, Application, Review	3 days
Functions	of values	C		
	-Comparing graphs of quadratic functions to the parent function $y=x^2$			
Solving Quadratic	-Solving quadratic equations by g		Lesson, Application, Review	2 days
Equations by Graphing	parabola and identifying the zero	s (points that		
	cross the x-axis)			
Use Square Roots to	-Solving quadratic equations by t	aking square	Lesson, Application, Review	3 days
Solve Quadratic	roots			
Equations	-Recognizing that square roots al	so have a		
	positive and negative value			4 days
	1 1 1 1 1	,• • ,		
The Quadratic Formula	-Recognizing when a quadratic e	quation is not	Lesson, Application, Review	4 days
The Quadratic Formula	factorable	-	Lesson, Application, Review	4 days
The Quadratic Formula	factorable -Applying the Quadratic Formula	-	Lesson, Application, Review	4 days
The Quadratic Formula	factorable -Applying the Quadratic Formula quadratic equations	a to solve		
Solving Systems with	factorable -Applying the Quadratic Formula quadratic equations -Solving systems of equations in	a to solve	Lesson, Application, Review Lesson, Application, Review	2 days
Solving Systems with	factorable -Applying the Quadratic Formula quadratic equations -Solving systems of equations inv quadratics by comparing the strat	a to solve volving tegies to		
Solving Systems with Quadratic Equations	factorable -Applying the Quadratic Formula quadratic equations -Solving systems of equations in quadratics by comparing the strat solving systems of linear equation	a to solve volving tegies to ns	Lesson, Application, Review	2 days
Solving Systems with Quadratic Equations Compare Linear,	factorable -Applying the Quadratic Formula quadratic equations -Solving systems of equations in quadratics by comparing the strat solving systems of linear equatio -Comparing and contrasting linear	a to solve volving tegies to ns		
Solving Systems with Quadratic Equations Compare Linear, Exponential, and	factorable -Applying the Quadratic Formula quadratic equations -Solving systems of equations inv quadratics by comparing the strat solving systems of linear equation -Comparing and contrasting linear and quadratic functions	a to solve volving tegies to ns ar, exponential	Lesson, Application, Review	2 days
Solving Systems with Quadratic Equations Compare Linear,	factorable -Applying the Quadratic Formula quadratic equations -Solving systems of equations inv quadratics by comparing the strat solving systems of linear equation -Comparing and contrasting linear and quadratic functions -Using the appropriate function to	a to solve volving tegies to ns ar, exponential	Lesson, Application, Review	2 days
Solving Systems with Quadratic Equations Compare Linear, Exponential, and Quadratic Models	factorable -Applying the Quadratic Formula quadratic equations -Solving systems of equations in quadratics by comparing the strat solving systems of linear equatio -Comparing and contrasting linea and quadratic functions -Using the appropriate function to world relationships	a to solve volving tegies to ns ar, exponential o model real-	Lesson, Application, Review	2 days
Solving Systems with Quadratic Equations Compare Linear, Exponential, and Quadratic Models	factorable -Applying the Quadratic Formula quadratic equations -Solving systems of equations inv quadratics by comparing the strat solving systems of linear equation -Comparing and contrasting linear and quadratic functions -Using the appropriate function to	a to solve volving tegies to ns ar, exponential o model real-	Lesson, Application, Review	2 days

directions, and explanationsspeaking -Rephrase questions, directions, andactivities -Build on students' intrinsic motivationsGuidance Counselors and follow I&RSdirections, and explanations-Allow extended timedirections, andintrinsic motivationsprocedures and action-Allow extended time	Students with Disabilities	English Language Learners	Gifted and Talented Students	Students at Risk	504 Students
-Consult with Case Managers and follow-Allow extended time on assessments-Consult with classroom teacher(s)-Consult with Guidance Counseld	directions, and explanations -Allow extended time on assessments -Consult with Case Managers and follow IEP modifications/accom	speaking -Rephrase questions, directions, and explanations -Allow extended time	activities -Build on students'	Guidance Counselors and follow I&RS procedures and action plans -Consult with classroom teacher(s) for specific behavior interventions -Provide extended time to complete tasks	explanations -Allow extended time on assessments -Consult with Guidance Counselors and 504 Committees to come up with procedures/504