Grade 8 Advanced Algebra 1 (8301)

Grade 7 Accelerated Pre-Algebra (7301) Required

Sayreville Middle School

5 Credits

Full Year

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Date Curriculum Approved/ Revised: 07/19/2016

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Statement of Purpose

Summary of the Course: Algebra 1 is designed to give students the requisite skills that provide a foundation for all future mathematics courses. Students will explore writing and solving linear equations, powers and exponents, quadratic equations, polynomials and factoring, graphing and solving linear inequalities, functions, and geometry. Throughout the course, mathematical concepts will be taught with an emphasis on real-world application, technology, and cross-curricular interaction. Questions like "How do you solve for the unknown?" "How do you graph a situation that you encounter in your own life?" and "How can I use math to make my life easier?" will be addressed throughout the course.

In order to demonstrate a cohesive and complete implementation plan the following general suggestions are provided:

- The use of various formative assessments are encouraged in order to provide an ongoing method of determining the current level of understanding the students have of the material presented.
- Homework, when assigned should be relevant and reflective of the current teaching taking place in the classroom.
- Organizational strategies should be in place that allow the students the ability to take the information gained in the classroom and put in in terms that are relevant to them.
- Instruction should be differentiated to allow students the best opportunity to learn.
- Assessments should be varied and assess topics of instruction delivered in class.
- Modifications to the curriculum should be included that address students with Individualized Educational Plans (IEP), English Language Learners (ELL), and those requiring other modifications (504 plans).

Unit 1: Expressions, Equations and Functions

Summary of the Unit: In this unit students will focus on the basics of algebra, showing how variables are used in forming algebraic expressions and how expressions are used in forming equations and inequalities. Along the way, students evaluate expressions using the order of operations and solve equations and inequalities to solve real-world problems.

Enduring Understanding: You can use multiple representations to describe a real-world situation. Functions can be represented as verbal rules, equations, tables, and graphs.

Essential Questions:

- Why are the order of operations and other properties of mathematics important?
- Why do we use variables and how are they implemented in real-world tasks?

Summative Assessment and/ or Summative Criteria to demonstrate mastery of the Unit.

- Students will take a test to review concepts learned in Unit 1
- Students will demonstrate mastery through various assessment criteria included the unit.
- Students will demonstrate mastery on the end of unit Performance Task

Resources:

- Holt McDougal Larson Algebra 1 (© 2012)
- IXL.com
- New Jersey Student Learning Standards

Topic/ Selection	Suggested Timeline per topic	General Objectives	Instructional Activities	Suggested Benchmarks/ Assessments	NJSLS
Evaluate Expressions (1.1)	1 day	Students will evaluate algebraic expressions and use exponents	- Complete chart on meaning of algebraic expressions and there operations - Match operation to algebraic expression - Complete chart on	- Accessing technology to watch www.brainpop.com pertaining to the current topic - Take follow up quiz for topic - IXL topics: I1-I6	9-12.N.Q.1 ELA.WHST.6-8.2.E

			exponents and its terminology - Evaluate expressions with exponents		
Apply Order of Operations (1.2)	1-2 days	Students will evaluate expressions using order of operations	- Perform addition, subtraction, multiplication and division following order of operations - Complete Graphing Calculator activity	- Accessing technology to watch www.brainpop.com pertaining to the current topic - Take follow up quiz for topic - Daily Homework check - IXL topic: B6	9-12.A.SSE.1
Write Expressions (1.3)	1 day	Students will translate verbal phrases into expressions	- Identify all terminology related to mathematical operations by creating chart for whole class to fill in - Create expressions from verbal models - Calculate unit rates and conversions	- Daily homework check - Emphasize value of properties - Journal Entry: How do you write an expression to represent a real-world situation? Quiz on 1.1-1.3	9-12.A.SSE.1 ELA.RST.6-8.2
Write Equations and Inequalities (1.4)	1 day	Students will translate verbal sentences into equations or inequalities	- Review all terminology related to mathematical operations by	- Daily Homework check - Mixed review suggested	9-12.A.CED.1

			reevaluating chart that whole class filled in - Make chart in notebook to highlight symbols used in equations and inequalities		
Use a Problem Solving Plan (1.5)	1 day	Students will discover problem solving plan and implement plan to solve problems	- Make chart for problem solving plan - Make chart for key formulas in back of notebook to be added to as year progresses	- Daily homework check - Alternative Method Activity on Drawing a Diagram to solve	9-12.A.CED.1
Use Precision and Measurement (1.6)	1 day	Students will compare measurements for precision	- Create chart for determining significant digits - Create chart for determining significant digits in calculations	- Daily homework check	9-12.N.Q.3 ELA.RST.6-8.2
Represent Functions as Rules and Tables (1.7)	1 day	Students will represent functions as rules and as tables	- Make input/output tables - Create mappings - Graphing Calculator Activity	- Daily homework check - Journal entry: How did you represent functions as tables and rules?	9-12.A.CED.2 ELA.WHST.6-8.2.E
Represent Functions as Graphs (1.8)	1 day	Students will represent functions as graphs	- Make a chart on how to represent a function	- Mixed Review - IXL topics: Q4, Q6, Q9, and Q 10	9-12.F.IF.4

			- Extension (Vertical Line Test)		
Review and Assess	2-3 days	Students will demonstrate mastery of topics and concepts presented	Chapter review using varied teacher created/chosen materials and tasks	- End of Unit Test - Completion of Journal Activities - Completion of Performance Assessment from online resources	9-12.N.Q.1 & 3 9-12.A.SSE.1 9-12.A.CED.1 & 2 9-12.F.IF.4
	10-12 days				

Suggested Modifications for Special Education, English Language Learners and Gifted Students:

*Consistent with individual plans, when appropriate.

- Students will be allowed to submit assignments using additional time per IEP modifications.
- Students will be encouraged to use different size and type of font in order to avoid print confusion.
- LEP students will be allowed to use an internet translator or language glossary in order to translate vocabulary and assignments properly.
- LEP students may be allowed to work with another student who is fluent in their native language.

Suggested Technological Innovations/ Use:

- Instructional technology should be used to present and assess lessons such as; SmartNotebook, PowerPoint, graphing calculators, Communicators/individual dry erase boards.
- Teachers are encouraged to use electronic assessments to determine mastery of concepts taught.
- The use of kahoot or other types of interactive software is encouraged.

Cross Curricular/ 21st Century Connections:

9.1 21st Century Life and Career Skills: All students will demonstrate the creative, critical thinking, collaboration, and problem-solving skills needed to function successfully as both global citizens and workers in diverse ethnic and organizational cultures.

9.2: All students will be able to identify the importance of being knowledgeable about one's interests and talents, and being well informed about postsecondary and career options, career planning, and career requirements.

Unit 2: Solving Linear Equations

Summary of the Unit: In this unit students will focus on properties of equality to solve one-step, two-step, and multi-step equations in one variable and rewrite equations in function form. They also will write ratios and proportions and solve proportions using cross products.

Enduring Understanding: Real world situations can be modeled by graphs and equations. Algebraic and numeric procedures are interconnected and build on one another. Integration of various mathematical procedures builds a stronger foundation of finding solutions.

Essential Questions:

- In what situation would it be necessary to solve an equation for a given variable?
- How do you apply the skills and understanding of linear equations translate into solving a variety of word problems?

Summative Assessment and/ or Summative Criteria to demonstrate mastery of the Unit.

- Students will take a test to review concepts learned in Unit 2
- Students will demonstrate mastery through various assessment criteria included the unit.
- Students will demonstrate mastery on the end of unit Performance Task

Resources:

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- IXL.com
- New Jersey Student Learning Standards

Topic/ Selection	Suggested Timeline per topic	General Objectives	Instructional Activities	Suggested Benchmarks/ Assessments	NJSLS
Find Square Roots and Compare Real Numbers (2.1)	1 day	Students will find square roots and compare real numbers	-Make chart of Real number system -Define key vocabulary -Interactive Notebook activity for square roots	-Daily Homework Check -IXL topic: J2 Journal Entry: Why is there more than one solution to a square root problem?	9-12.N.Q.1 ELA.WHST.6-8.2.E

Solve One-Step Equations (2.2)	1 day	Students will solve one-step equations using algebra	-Make chart for Properties of Addition, Subtraction, Multiplication and Division -	-Daily Homework Check -IXL topic: J3 -Investigating Algebra Activity on Modeling One-Step Equations suggested	9-12.A.REI.3
Solve Two-Step Equations (2.3)	1 day	Students will use algebra to solve two-step equations	-Interactive Notebook activity - Model two step equations using Algebra tiles-suggested	-Daily Homework Check -IXL topic: J4	9-12.A.REI.3
Solve Multi-Step Equations (2.4)	1-2 days	Students will solve multi-step equations using algebra	-Define vocabulary -Journal Entry step by step instructions on how to solve multi-step equation	-Daily Homework Check -IXL topic: J6 Quiz on 2.1-2.4 Journal Entry: Model solving a multi-step equation without using numbers or symbols	9-12.A.REI.3 ELA.WHST.6-8.2.E
Solve Equations with Variables on Both Sides (2.5)	1-2 days	Students will solve equations with variables on both sides	-Model equations using Algebra tiles showing variables on both sides -Model writing equations from word problems	-Daily Homework Check -IXL topic: J7 -Mixed Review suggested	9-12.A.REI.3 ELA.RST.6-8.2

Write Ratios and Proportions (2.6)	1 day	Students will find ratios and write and solve proportions	-Make chart to organize information on work problems -	-Daily Homework Check -IXL topics: C2, C3, and C4	9-12.A.CED.1
Solve Proportions using Cross Products (2.7)	1 day	Students will solve proportions using cross products	-Create chart on Cross Products - Create a Scale model of item inside the classroom or classroom dimensions in notebook	-Daily Homework Check -IXL topic: C5 Journal Entry: How are scale models using in real-world applications?	9-12.A.CED.1 ELA.WHST.6-8.2.E
Rewrite Equations and Formulas (2.8)	1-2 days	Students will rewrite equations and formulas using algebra	-Make table of properties to use with variables	-Daily Homework Check Mixed Review suggested Quiz on 2.5 to 2.8	9-12.A.CED.1 ELA.RST.6-8.2
Review and Assess	2-3 days	Students will demonstrate mastery of topics and concepts presented	Chapter review using varied teacher created/chosen materials and tasks	- End of Unit Test - Completion of Journal Activities - Completion of Performance Assessment from online resources	9-12.N.Q.1 9-12.A.REI.3 9-12.A.CED.1
	10-14 days				

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Unit 3: Graphing Linear Equations and Functions

Summary of the Unit: In this unit students will focus on graphing linear equations using tables, x- and y-intercepts, and slope and y-intercept. They will also explore how changing the slope and y-intercept changes the graph and how slope identifies parallel lines. They will write direct variation equations and use them to solve real-world problems in addition to function notation and compare families of graphs.

Enduring Understanding: Construction and analysis of tables, graphs, and equations to describe linear relationships and other simple relations. Write, solve, and graph multi-step equations. Graph proportional relationships and identify the unit rate as slope of linear functions.

Essential Questions:

- How do you graph linear equations?
- How do you find the slope of a line and interpret slope as a rate of change?

Summative Assessment and/ or Summative Criteria to demonstrate mastery of the Unit.

- Students will take a test to review concepts learned in Unit 3
- Students will demonstrate mastery through various assessment criteria included the unit.
- Students will demonstrate mastery on the end of unit Performance Task

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Topic/ Selection	Suggested Timeline per topic	General Objectives	Instructional Activities	Suggested Benchmarks/ Assessments	NJSLS
Plot Points on Coordinate Plane (3.1)	1 day	Students will identify and plot points on a coordinate plane	- Graphing scavenger hunt - Make a table for output in a function	Journal Entry: Where are grids and graphs used in real-world applications?	9-12.F.IF.7 ELA.WHST.6-8.2.E
Graph Linear Equations (3.2)	2 days	Students will graph linear equations on	- Graph equations using table	Daily Homework Check	9-12.F.IF.7a

		a coordinate plane	- Graphing Calculator Activity suggested - Identify Discrete and Continuous Functions Extension suggested	IXL topic: S15 Quiz on 3.1 to 3.2 suggested	
Graph Using Intercepts (3.3)	1-2 days	Students will graph a linear equation using intercepts	- Make a chart for intercepts	Daily Homework check IXL topic: S12 Mixed Review suggested	9-12.F.IF.7a ELA.RST.6-8.2
Find Slope and Rate of Change (3.4)	2-3 days	Students will find the slope of a line and interpret slope as a rate of change	- Investigating Algebra Activity on discovering changes in slope when rise or run changes - Make a chart for types of slope and slope formula	- Accessing technology to watch www.brainpop.com pertaining to the current topic - Take follow up quiz for topic - Daily Homework check IXL topic: S3 Journal Entry: How do you find the slope of a line and interpret as a rate of change?	9-12.F.IF.6 ELA.WHST.6-8.2.E
Graph Using Slope-Intercept	3 days	Students will graph linear equations	-Investigating Algebra Activity	- Daily Homework check	9-12.F.IF.7a

Form (3.5)		using slope-intercept form	before lesson - Make chart on slope-intercept form identifying parts of slope-intercept form	- IXL topic: S6 - Solve Linear Equations by Graphing Extension suggested Quiz on 3.1 to 3.5	
Model Direct Variation (3.6)	2 days	Students will write and graph direct variation equations	- Create a chart displaying types of direct variation	Daily Homework check IXL topics: R1, R2, and R3 Use Alternative Method Activity on using a graph to solve example 4 suggested	9-12.A.CED.2
Graph Linear Functions (3.7)	2-3 days	Students will use function notation	- Create chart on parent functions - Make comparison chart on changes to parent function - Graphing Calculator Activity suggested	-Daily homework check -Mixed Review suggested -	9-12.F.IF.7a ELA.RST.6-8.2
Review and Assess	2-3 days	Students will demonstrate mastery of topics and concepts presented	Chapter review using varied teacher created/chosen materials and tasks	- End of Unit Test - Completion of Journal Activities - Completion of Performance	9-12.F.IF.6 9-12.F.IF.7 9-12.F.IF.7a 9-12.A.CED.2

				Assessment from online resources	
	15-19 days				

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Unit 4: Writing Linear Equations

Summary of the Unit: In this unit students will focus on how to write a linear equation in various forms depending on the information given. Also, they will write and graph equations using a graph or real-world data and use lines of best fit to model data and make predictions.

Enduring Understanding: The functions and relationship concepts are fundamental ideas in mathematics. Real-world situations can be modeled by graphs and equations.

Essential Questions:

- How do you write equations in slope-intercept form? Point-slope form? Standard form?
- How do you know that a linear equation is a good model for a set of data?

Summative Assessment and/ or Summative Criteria to demonstrate mastery of the Unit.

- Students will take a test to review concepts learned in Unit 4
- Students will demonstrate mastery through various assessment criteria included the unit.
- Students will demonstrate mastery on the end of unit Performance Task

Resources:

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- IXL.com
- New Jersey Student Learning Standards

Topic/ Selection	Suggested Timeline per topic	General Objectives	Instructional Activities	Suggested Benchmarks/ Assessments	NJSLS
Write Linear Equations in Slope-Intercept Form (4.1)	1 day	Students will write equations of lines	- Graphing Calculator Activity suggested	- Journal Entry: What is the "change number" in the equation $y = 2x + 1$? Daily Homework check	9-12.A.CED.2 ELA.WHST.6-8.2.E
Use Linear Equations in Slope-	1 day	Students will write an equation of a	- Make a chart to display steps for	Using Alternative Methods Activity	9-12.A.CED.2

Intercept Form (4.2)		line using points on the line	writing an equation - Interactive notebook chart on how to write with given information	on using a graph or table to solve example 5 suggested Daily Homework check	
Write Linear Equations in Point-Slope Form (4.3)	2 days	Students will write linear equations in point-slope form	- Replicate graph to identify parts of point-slope form	Daily homework check IXL topics: S16, S17, and S18 Relate Arithmetic Sequences to Linear Function Activity suggested Quiz on 4.1 to 4.3	9-12.A.CED.2
Write Linear Equations in Standard Form (4.4)	1 day	Students will write equations in standard form	-Standard form and linear equation matching game activity	Daily Homework check Mixed Review suggested	9-12.A.CED.2 ELA.RST.6-8.2
Write Equations of Parallel and Perpendicular Lines (4.5)	1-2 days	Students will write equations of parallel and perpendicular lines	-Determine if graphs are parallel or perpendicular based on slope of line -Match lines to correct linear equation; use matches to	Daily Homework check Quiz 4.4 to 4.5	9-12.F.LE.2

			determine parallel or perpendicular lines		
Fit a Line to Data (4.6)	1 day	Students will make scatter plots and write equations to model data	- Make a chart for types of scatter plots - Spaghetti Lab suggested - Graphing Calculator Activity suggested	- Journal Entry: Provide examples for the 3 different types of equations from this unit. Exit ticket Daily Homework check	9-12.S.ID.6c ELA.WHST.6-8.2.E
Predict with Linear Models (4.7)	1-2 days	Students will make predictions using best-fitting lines	- Use graphing calculator to calculate line of best-fit - Make a chart of key concepts	Daily Homework check Mixed Review suggested	9-12.S.ID.6a ELA.RST.6-8.2
Review and Assess	2-3 days	Students will demonstrate mastery of topics and concepts presented	Chapter review using varied teacher created/chosen materials and tasks	- End of Unit Test - Completion of Journal Activities - Completion of Performance Assessment from online resources	9-12.A.CED.2 9-12.F.LE.2 9-12.S.ID.6a 9-12.S.ID.6c
	10-13 days				

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Unit 5: Systems of Equations

Summary of the Unit: In this unit students will focus on using graphing, substitution and elimination to solve systems of linear equations. Students will also identify linear systems as having one solution, no solution, or infinitely many solutions.

Enduring Understanding: There are situations that require two or more equations to be satisfied simultaneously. Solutions to systems of equations can be interpreted algebraically, geometrically, and in terms of problem contexts.

Essential Questions:

- How can you use numbers and symbols to represent mathematical ideas?
- What does the solution to a system of equations represent?

Summative Assessment and/ or Summative Criteria to demonstrate mastery of the Unit.

- Students will take a test to review concepts learned in Unit 5.
- Students will demonstrate mastery through various assessment criteria included the unit.
- Students will demonstrate mastery on the end of unit Performance Task

Resources:

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Topic/ Selection	Suggested Timeline per topic	General Objectives	Instructional Activities	Suggested Benchmarks/ Assessments	NJSLS
Solve Linear Systems by Graphing (6.1)	1 day	Students will graph and solve systems of linear equations	- Graphing Calculator Activity	- Daily Homework check - IXL topics: U2, U3, and U4	9-12.A.REI.6
Solve Linear Systems by Substitution (6.2)	1-2 days	Students will solve systems of linear equations by substitution	-Linear system partner activity: each student answers set of questions- variety of graphing and substitution.	- Journal Entry: How do you find the solution to a system of equations by graphing?	9-12.A.REI.6 ELA.WHST.6-8.2.E

			Compare answers to make sure each set of equations is correct	- Daily Homework check - IXL topic: U8 and U9	
Solve Linear Systems by Adding or Subtracting (6.3)	1-2 days	Students will solve linear systems using elimination	Interactive Notebook chart	- Daily Homework check - IXL topic: U10 Quiz 6.1 to 6.3	9-12.A.REI.6
Solve Linear Systems by Multiplying First (6.4)	1-2 days	Students will solve linear systems by multiplying first	Foldable of different methods of solving systems of equations suggested	- Daily Homework check - IXL topics: U11 and U12 - Graphing Calculator Activity suggested - Mixed Review suggested	9-12.A.REI.6 ELA.RST.6-8.2
Solve Special Types of Linear Systems (6.5)	2-3 days	Students will identify the number of solutions of a linear system	- Make a chart of possible solutions and slope/y-intercept with images - Piecewise Function Extension suggested	- Daily Homework check - IXL topics: U14 and U15	9-12.A.REI.6
Review and Assess	2-3 days	Students will demonstrate mastery of topics	Chapter review using varied teacher created/chosen	- End of Unit Test - Completion of Journal Activities	9-12.A.REI.6

		and concepts presented	materials and tasks	- Completion of Performance Assessment from online resources	
	8-13 days				

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Unit 6: Solving and Graphing Linear Inequalities

Summary of the Unit: In this unit students will focus on how to solve linear inequalities in one variable and graph linear inequalities in two variables.

Enduring Understanding: The characteristics of linear inequalities and their representations are useful in solving real-world problems.

Essential Questions:

- How do you solve inequalities using each of the four math operations?
- How do you solve compound inequalities?

Summative Assessment and/ or Summative Criteria to demonstrate mastery of the Unit.

- Students will take a test to review concepts learned in Unit 6
- Students will demonstrate mastery through various assessment criteria included the unit.
- Students will demonstrate mastery on the end of unit Performance Task

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Topic/ Selection	Suggested Timeline per topic	General Objectives	Instructional Activities	Suggested Benchmarks/ Assessments	NJSLS
Solve Inequalities Using Addition and Subtraction (5.1)	1 day	Students will solve inequalities using addition and subtraction	- Create chart for Properties of Inequality - Use large number line to graph solutions	- Journal Entry: What is the difference in an answer that has an equal sign and an inequality symbol? Daily Homework check XL topic: K4	9-12.A.REI.3 ELA.WHST.6-8.2.E

Solve Inequalities Using Multiplication and Division (5.2)	1 day	Students will solve inequalities using multiplication and division	- Expand on chart for Properties of Inequality - Use large number line to graph solutions	Daily Homework check IXL topic: K5	9-12.A.REI.3
Solve Multi-Step Inequalities (5.3)	1-2 days	Students will solve multi-step inequalities	- Use large number line to graph solutions - Using Alternative Method suggested	Daily Homework check IXL topics: K8 and K9 Quiz on 5.1 to 5.3 Solve Linear Inequalities by Graphing suggested	9-12.A.REI.3
Solve Compound Inequalities (5.4)	2-3 days	Students will solve compound inequalities	Investigating Algebra Activity making Venn Diagrams to compare AND and OR statements Graphing Calculator Activity suggested	Daily Homework check Mixed Review suggested IXL topics: K12-15	9-12.A.REI.3 ELA.RST.6-8.2
Solve Absolute Value Equations (5.5)	1-2 days	Students will solve absolute value equations	-Graph Absolute Value Functions Extension -Make chart with diagrams to show differences in	Daily Homework check IXL topics: L1 and L2	9-12.A.CED.1

			absolute value functions		
Solve Absolute Value Inequalities (5.6)	2-3 day	Students will solve absolute value inequalities	-Make chart for concept summary	Daily Homework check Quiz 5.4 to 5.6	9-12.A.CED.1
Graph Linear Inequalities in Two Variables (5.7)	1-2 days	Students will graph linear inequalities with two variables	-Graph linear equivalent then shade correct side of graph using marker or highlighter -Use graphing calculator to graph inequalities with shading	Daily Homework check Mixed Review suggested IXL topics: L3 and L4	9-12.A.REI.12 ELA.RST.6-8.2
Solve Systems of Linear Inequalities (6.6)	1-2 days	Students will solve systems of linear inequalities in two variables	-Graph linear equivalent then shade correct side of graph using marker or highlighter. Use one color for each inequality; overlap is the correct answer	- Journal Entry: List the steps and describe how to solve a given inequality problem Daily Homework check IXL topic: T6	9-12.A.REI.12 ELA.WHST.6-8.2.E
Review and Assess	2-3 days	Students will demonstrate mastery of topics and concepts presented	Chapter review using varied teacher created/chosen materials and tasks	- End of Unit Test - Completion of Journal Activities - Completion of Performance Assessment from online resources	9-12.A.REI.3 9-12.A.REI.12 9-12.A.CED.1
	12-19 days				

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9.1 21st Century Life and Career Skills: All students will demonstrate the creative, critical thinking, collaboration, and problem-solving skills needed to function successfully as both global citizens and workers in diverse ethnic and organizational cultures.
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Unit 7: Polynomials and Factoring

Summary of the Unit: In this unit students will identify, classify, add, subtract, and multiply polynomials. They will use vertical and horizontal formats to find sums and differences. To find products they will use the distributive property. They will write polynomials to describe and solve real-world problems and solve polynomial equations.

Enduring Understanding: The properties of integers apply to polynomials. Multiplying and factoring polynomials are related. Solving polynomials involves the reversal of operations, the distributive property and rules of exponents.

Essential Questions:

- How does the concept of combining like terms work as it relates to operations with polynomials?
- What is the relationship of the distributive property and the concept of factoring out a common factor from an expression?

Summative Assessment and/ or Summative Criteria to demonstrate mastery of the Unit.

- Students will take a test to review concepts learned in Unit 7
- Students will demonstrate mastery through various assessment criteria included the unit.
- Students will demonstrate mastery on the end of unit Performance Task

Resources:

- Holt McDougal Larson Algebra 1 (© 2012)
- IXL.com
- New Jersey Student Learning Standards for Mathematics

Topic/ Selection	Suggested Timeline per topic	General Objectives	Instructional Activities	Suggested Benchmarks/ Assessments	NJSLS
Add and Subtract Polynomials (8.1)	1 day	Students will add and subtract polynomials	-Make chart for degree of polynomials -Graphing Calculator Activity suggested	Daily Homework check IXL topics: Z3, Z4, and Z5	9-12.A.APR.1
Multiply Polynomials (8.2)	1 day	Students will multiply polynomials	-Make interactive notebook chart for 4 ways of	Daily Homework check	9-12.A.APR.1

			multiplying	IXL topic: Z6	
Find Special Products of Polynomials (8.3)	1 day	Students will use special product patterns to multiply polynomials	Practice finding special products using whiteboard to show the differences in types of special products	Daily Homework check IXL topic: Z9	9-12.A.APR.1
Solve Polynomial Equations in Factored Form (8.4)	1-2 days	Students will solve polynomial equations	-Vertical Motion Model task card activity suggested	Daily Homework check Quiz 8.1 to 8.4 Mixed Review suggested	9-12.A.REI.4b ELA.RST.6-8.2
Factor $x^2 + bx + c$ (8.5)	1-2 days	Students will factor trinomials of the form $x^2 + bx + c$	Make Multiply/Add tables to create lists of possible factor solutions Investigating Algebra Activity using modeling to show factorization suggested	Daily Homework check IXL topic: AA3 -Using Alternative Methods Activity to solve example 5 using a table suggested	9-12.A.SSE.3a
Factor $ax^2 + bx + c$ (8.6)	1-2 days	Students will factor trinomials of the form $ax^2 + bx + c$	Foldable activities suggested on factoring trinomials	Journal Entry: What prior knowledge did you use in today's lesson? Daily Homework	9-12.A.SSE.3a ELA.WHST.6-8.2.E

				check IXL topic: AA4	
Factor Special Products (8.7)	1-2 days	Students will factor special products	Use whiteboards to show differences in two types of prefect square trinomials	Daily Homework check IXL topic: AA5	9-12.A.SSE.2
Factor Polynomials Completely (8.8)	1-2 days	Students will factor polynomials completely	"I Have…Who Has?" activity suggested	Daily Homework check Mixed Review suggested IXL topic: AA7, AA8	9-12.A.SSE.3a ELA.RST.6-8.2
Review and Assess	2-3 days	Students will demonstrate mastery of topics and concepts presented	Chapter review using varied teacher created/chosen materials and tasks	- End of Unit Test - Completion of Journal Activities - Completion of Performance Assessment from online resources	9-12.A.APR.1 9-12.A.REI.4b 9-12.A.SSE.2 9-12.A.SSE.3a
	10-16 days				

Suggested Modifications for Special Education, English Language Learners and Gifted Students:
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- Students will be encouraged to use different size and type of font in order to avoid print confusion.
- LEP students will be allowed to use an internet translator or language glossary in order to translate vocabulary and assignments properly.
- LEP students may be allowed to work with another student who is fluent in their native language.

Suggested Technological Innovations/ Use:

- Instructional technology should be used to present and assess lessons such as; SmartNotebook, PowerPoint, graphing calculators, Communicators/individual dry erase boards.
- Teachers are encouraged to use electronic assessments to determine mastery of concepts taught.
- The use of kahoot or other type of interactive software is encouraged.

Cross Curricular/ 21st Century Connections:

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Unit 8: Exponents and Exponential Functions

Summary of the Unit: In this unit students will focus on properties of exponents involving products and quotients. Students will also graph and write rules for exponential functions, including exponential growth and exponential decay functions.

Enduring Understanding: Patterns, functions and relationships can be represented graphically, numerically, symbolically or verbally. The function and relationship concepts are fundamental ideas in mathematics.

Essential Questions:

- How is dividing powers different than multiplying powers?
- What does the concept of a negative exponent mean, as it relates to the size of a number or where the variable should be in a quotient?
- How do you write and graph equations for exponential growth and decay functions?

Summative Assessment and/ or Summative Criteria to demonstrate mastery of the Unit.

- Students will take a test to review concepts learned in Unit 8
- Students will demonstrate mastery through various assessment criteria included the unit.
- Students will demonstrate mastery on the end of unit Performance Task

Resources:

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Topic/ Selection	Suggested Timeline per topic	General Objectives	Instructional Activities	Suggested Benchmarks/ Assessments	NJSLS
Apply Exponent Properties Involving Products (7.1)	1 day	Students will use properties of exponents involving products	-Make group chart for wall with different properties of exponents	Daily Homework check IXL topics: V4, V7, V8 and V9	9-12.A.SSE.3c
Apply Exponent Properties	1-2 day	Students will use properties of	-Expand chart with new properties	Daily Homework check	9-12.A.SSE.3c

Involving Quotients (7.2)		exponents involving quotients		IXL topics: v5 and V6	
Define and Use Zero and Negative Exponents (7.3)	1-2 days	Students will use zero and negative exponents	-Investigating Algebra Activity suggested -Expand chart with new properties -Define and Use Fractional Exponents Extension suggested	Daily Homework check Quiz 7.1 to 7.3 Mixed Review suggested IXL topic: V3	9-12.A.SSE.3c ELA.RST.6-8.2
Write and Graph Exponential Growth Functions (7.4)	1-2 days	Students will write and graph exponential growth models	-Create function rule tables for exponential functions -Graph exponential growth functions to compare functions from parent function	Journal topic: List everything you know about the Rules of Exponents. Daily Homework check IXL topics: X2 and X3	9-12.A.CED.2 ELA.WHST.6-8.2.E
Write and Graph Exponential Decay Functions (7.5)	1-2 days	Students will write and growth exponential decay functions	-Create function rule tables for exponential functions -Graph exponential decay functions to compare functions from parent function	Daily Homework check M&M growth and decay lab suggested	9-12.A.CED.2
Review and Assess	2-3 days	Students will	Chapter review	- End of Unit Test	9-12.A.SSE.3c

		demonstrate mastery of topics and concepts presented	using varied teacher created/chosen materials and tasks	- Completion of Journal Activities - Completion of Performance Assessment from online resources	9-12.A.CED.2
	7-12 days				

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Unit 9: Quadratic Equations and Functions

Summary of the Unit: In this unit students will focus on graphing quadratic functions and comparing them to the parent graph. They will solve quadratic equations using various methods, solve systems with quadratic equations, and determine which type of equation best models a set of data.

Enduring Understanding: The graph of quadratic equations has many uses in the real-world. From sports, to architecture, to construction, and beyond. The knowledge gained in this unit will extend to other curricula.

Essential Questions:

- How can you tell if the graph of a quadratic equation will open up or down?
- Why do you get two solutions when solving a quadratic equation?

Summative Assessment and/ or Summative Criteria to demonstrate mastery of the Unit.

- Students will take a test to review concepts learned in Unit 9
- Students will demonstrate mastery through various assessment criteria included the unit.
- Students will demonstrate mastery on the end of unit Performance Task

Resources:

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Topic/ Selection	Suggested Timeline per topic	General Objectives	Instructional Activities	Suggested Benchmarks/ Assessments	NJSLS
Graph $y= ax^2 + c$ (9.1)	1 day	Students will graph simple quadratic functions	-Make chart of key concepts	Daily Homework check IXL topic: BB1	9-12.F.BF.3
Graph $y= ax^2 + bx + c$ (9.2)	1-2 days	Students will graph general quadratic functions	-Expand key concepts chart -Graph Quadratic Functions in Intercept Form	Daily Homework check Quiz on 9.1 to 9.2	9-12.F.IF.7a

			Extension suggested		
Solve Quadratic Equations by Graphing (9.3)	2-3 days	Students will solve quadratic equations by graphing	-Make chart of concept summary -Graphing Calculator activity on Finding Maximum and Minimum Values and Zeros	Journal Entry: Find something you learned today that is similar to something that you already knew. Write about these similarities. Daily Homework check IXL topic: BB2	9-12.F.IF.7a ELA.WHST.6-8.2.E
Use Square Roots to Solve Quadratic Equations (9.4)	2-3 days	Students will solve a quadratic equation by finding square roots	Using Alternative Methods using factoring or a table suggested	Daily Homework check Mixed Review suggested	9-12.A.REI.4b ELA.RST.6-8.2
Solve Quadratic Equations by Completing the Square (9.5)	2-3 days	Students will solve quadratic equations by completing the square	Graph Quadratic Functions in Vertex Form suggested	Daily Homework check IXL topics: BB7 and BB8	9-12.A.REI.4b
Solve Quadratic Equations by the Quadratic Formula (9.6)	2-3 days	Students will solve quadratic equations by using the quadratic formula	-Watch student created videos on quadratic formula -Make chart for concept summary -Use graphing calculator to check	Daily Homework check Quiz 9.3 to 9.6 IXL topic: BB9	9-12.A.REI.4b

			accuracy		
Solve Systems with Quadratic Equations (9.7)	2-3 days	Students will solve systems that include a quadratic equation	-Use graphing calculator to check accuracy of graphs	Daily Homework check IXL topic: BB11	9-12.A.REI.11
Compare Linear, Exponential and Quadratic Models (9.8)	2-3 days	Students will compare linear, exponential, and quadratic models	-Make a compare/contrast chart for all three types of functions -Graphing Calculator Activity on Perform Regressions suggested	Daily Homework check IXL topics: CC1 and CC2	9-12.A.CED.2
Model Relationships (9.9)	1 day	Students will compare relationships of these functions	-Model real-life examples of graphs and functions -Graphing Calculator Activity on Average Rate of Change suggested	Daily Homework check Mixed Review suggested	9-12.F.IF.4 ELA.RST.6-8.2
Review and Assess	2-3 days	Students will demonstrate mastery of topics and concepts presented	Chapter review using varied teacher created/chosen materials and tasks	- End of Unit Test - Completion of Journal Activities - Completion of Performance Assessment from online resources	9-12.F.BF.3 9-12.F.IF.4 9-12.F.IF.7a 9-12.A.CED.2 9-12.A.REI.4b 9-12.A.REI.11
	17-25 days				

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Unit 10: Data Analysis

Summary of the Unit: In this unit students will focus on identifying population and sampling methods and data analysis using a two-way frequency table. Students will identify potentially biased samples and questions and compare measures of central tendencies.

Enduring Understanding: The way data is collected, organized and displayed influences interpretation. Decision making relies on the accuracy of the displayed data.

Essential Questions:

- How do you determine which measures of central tendency best represents a given set of data?
- What are the essential parts to a box-and-whisker plot and how do you interpret the data?

Summative Assessment and/ or Summative Criteria to demonstrate mastery of the Unit.

- Students will take a test to review concepts learned in Unit 10
- Students will demonstrate mastery through various assessment criteria included the unit.
- Students will demonstrate mastery on the end of unit Performance Task

Resources:

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Topic/ Selection	Suggested Timeline per topic	General Objectives	Instructional Activities	Suggested Benchmarks/ Assessments	NJSLS
Analyze Surveys and Samples (10.1)	1 day	Students will identify populations and sampling methods	-Examine real-life surveys to determine population and sample of survey	-Journal entry on how surveys can be biased and when would a company use a biased survey? Daily Homework check	9-12.S.IC.1 ELA.WHST.6-8.2.E
Use Measures of Central Tendency	1 day	Students will compare measures	-Examine measures of central tendency	Daily Homework check	9-12.S.ID.2

and Dispersion (10.2)		of central tendency and dispersion	from class driven data -Calculate Variance and Standard Deviation Extension suggested	Mixed review suggested	ELA.RST.6-8.2
Analyze Data (10.3)	1-2 days	Students will find frequencies in a two-way frequency table	-Create a class frequency table on class driven data	Daily Homework check Quiz 10.1 to 10.3 IXL topics: N1 and N2	9-12.S.ID.5
Interpret Stem-and-Leaf Plots and Histograms (10.4)	1 day	Students will make stem-and-leaf plots and histograms	-Use class driven data to create stem-and-leaf plot -Make frequency table from prices on a restaurant menu -Graphing Calculator Activity suggested	Daily Homework check IXL topic: N4	9-12.S.ID.1
Interpret Box-and-Whisker Plots (10.5)	1-2 days	Students will make and interpret box-and-whisker plots	-Use price of televisions to create box-and-whisker plots -Determine outliers from given data -Using Alternative Method suggested	Daily Homework check Mixed Review suggested IXL topic: N5	9-12.S.ID.1 ELA.RST.6-8.2

			-Analyze Data Distribution Extension suggested		
Review and Assess	2-3 days	Students will demonstrate mastery of topics and concepts presented	Chapter review using varied teacher created/chosen materials and tasks	- End of Unit Test - Completion of Journal Activities - Completion of Performance Assessment from online resources	9-12.S.IC.1 9-12.S.ID.1 9-12.S.ID.2 9-12.S.ID.5
	7-10 days				

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Unit 11: Probability

Summary of the Unit: In this unit students will focus on calculating probabilities and odds of simple events. They will determine if a situation is a permutation or a combination and apply the appropriate formula.

Enduring Understanding: The probability of an event's occurrence can be predicted with varying degrees of confidence.

Essential Questions:

- How do you determine whether a situation represents a permutation or a combination?
- How can you distinguish between overlapping and disjointed events?
-

Summative Assessment and/ or Summative Criteria to demonstrate mastery of the Unit.

- Students will take a test to review concepts learned in Unit 11
- Students will demonstrate mastery through various assessment criteria included the unit.
- Students will demonstrate mastery on the end of unit Performance Task

Resources:

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Topic/ Selection	Suggested Timeline per topic	General Objectives	Instructional Activities	Suggested Benchmarks/ Assessments	NJSLS
Find Probabilities and Odds (11.1)	1-2 days	Students will find sample spaces and probabilities	-Use Smart Notebook to show options for samples (dice, coin, spinner) -Use same options to examine theoretical and experimental probabilities	Journal Entry- How does theoretical and experimental probabilities differ? Daily Homework Check IXL topic: JJ1 and JJ2	9-12.S.CP.1 ELA.WHST.6-8.2.E
Find Probabilities Using Permutations	1-2 days	Students will use the formula for the	-Make chart of permutation	Daily Homework Check	9-12.S.CP.9(+)

(11.2)		number of permutations	possibilities using real-life examples (running a race, etc)	IXL topic: JJ6	
Find Probabilities Using Combinations (11.3)	2-3 days	Students will use combinations to count possibilities	-Make fake school lunch menu with different types of sides; use number of sides to determine possible combinations -Graphing Calculator activity	Daily Homework Check IXL topic: JJ3 and JJ4 Mixed review suggested Quiz on 11.1-11.3	9-12.S.CP.9(+) ELA.RST.6-8.2
Find Probabilities of Disjoint and Overlapping Events (11.4)	1-2 days	Students will find probabilities of compound events	-Investigating Algebra Activity on Finding Probability using Venn Diagram -Class made Venn Diagrams to show difference in disjointed and overlapping events -Make chart of algebraic formulas	Daily Homework Check IXL topic: JJ5	9-12.S.CP.1
Find Probabilities of Independent and Dependent Events (11.5)	1-2 days	Students will examine independent and dependent events	-Create Smart Notebook file for options of events -Create chart to organize differences in	Journal Entry: How can you explain independent verses dependent in real-life terms? Daily Homework	9-12.S.CP.2 ELA.WHST.6-8.2.E

			independent and dependent event examples	Check IXL topic	
Review and Assess	2-3 days	Students will demonstrate mastery of topics and concepts presented	Chapter review using varied teacher created/chosen materials and tasks	- End of Unit Test - Completion of Journal Activities - Completion of Performance Assessment from online resources	9-12.S.CP.1 9-12.S.CP.2 9-12.S.CP.9(+)
	8-14 days				

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