

Sayreville Public Schools Template
Algebra 1

Algebra 1: 802

Sayreville Middle School

Sayreville War Memorial High School

5 Credits

Full Year

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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: Solving Linear Equations

Summary of the Unit: Chapter 1 presents the foundational skills related to solving linear equations and the connected skills of rewriting equations and formulas. Students will be expected to work together on explorations, to make conjectures, to construct viable arguments, and to critique the reasoning of others.

Enduring Understanding: Creating, solving, and analyzing problems involving operations with rational numbers is essential in mathematics and the real world.

Essential Questions:

- How can you use simple and multi-step equations to solve real-life problems?
- How can you use a formula for one measurement to write a formula for a different measurement?

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 complete and respond to the given journal entries. The Journal entries will be combined for a quarterly assessment grade.
- Students will demonstrate mastery through various assessment criteria included in the unit.

Resources:

- Big Ideas Learning Math Algebra 1 (2015)
- IXL.com
- New Jersey Student Learning Standards for Mathematics

Topic/ Selection	Suggested Timeline per topic	General Objectives	Instructional Activities	Suggested Benchmarks/ Assessments	New Jersey Student Learning Standards
Solving Simple Equations (1.1)	1-2 days	Students will solve linear equations using addition, subtraction, multiplication, and division and use	1.1 Exploration Activity Review all terminology related to solving equations.	Mini review/assessment on operations on integers/rational numbers	HSA-CED.A.1 HSA-REI.A.1 HSA-REI.B.3

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		these equations to solve real-life problems.	Have students identify inverse operations. Have students model the four-step approach to Problem Solving and Common Problem Solving strategies.	Classwork assigned including real world application problems Teacher chosen/ created worksheets/activities with higher level one-step equations and application problems Suggested IXL to supplement/enhance lesson: J.3 Closure activity to assess common misconceptions such as $t - (-5) = 9$ and $-x = 2$ Homework assigned	
Solving Multi-Step Equations (1.2)	2-3 days	Students will solve multi-step linear equations using inverse operations. Students will use multi-step linear equations to solve real-life problems. Students will use unit analysis to model real-life problems.	1.2 Exploration activity Review all terminology related to solving equations. Incorporate the algebraic concepts of "Solving Multi-Step Equations" to the geometric concepts of "Solving for Angle Measures of a Polygon."	Classwork assigned including real world application problems Teacher chosen/ created worksheets/activities with higher level two-step equations and application problems Suggested IXL to supplement/enhance lesson: J.4	HSN-Q.A.1 HSA-CED.A.1 HSA-REI.B.3

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				Homework Assigned	
Solving Equations with Variables on Both Sides (1.3)	2-3 days	Students will solve linear equations that have variables on both sides and use linear equations to solve real-life problems. Students will identify special solutions of linear equations.	1.3 Exploration Activity Review all terminology related to solving equations with variables on both sides of the equation.	Mini Quiz based on previous material (1.1-1.2). Teacher chosen/created worksheets/activities with higher level equations and application problems Suggested IXL to supplement/enhance lesson: J.6, J.8 Classwork assigned including real world application problems Homework Assigned	HSA-CED.A.1 HSA-REI.B.3
Solving Absolute Value Equations (1.4)	1-2 days	Students will solve absolute value equations including equations involving two absolute values. Students will identify special solutions of absolute value equations.	Add lesson vocabulary terms/examples to notes. Define and model the meaning of absolute value. Exploration 2.	Mini Quiz based on previous material. Homework assigned. Classwork assigned including real world application problems Suggested IXL to supplement/enhance lesson: L.1, L.2	HSA-CED.A.1 HSA-REI.B.3

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Rewriting Equations and Formulas (1.5)	2 days	Students will rewrite literal equations, rewrite and use formulas for area and other common formulas.	Review all terminology related to rewriting equations Suggest students to circle the term containing the requested variable or highlight it with color so they can remember which variable they are trying to isolate.	Mini Quiz based on previous material (1.3). Classwork assigned including real world application problems Homework assigned	HSA-CED.A.4
Review and Assess	2 days	Students demonstrate mastery of topics and concepts presented	Chapter review using varied teacher created/chosen materials and tasks	End of Unit Test Completion of Journal Assessment	HSA-CED.A.1 HSA-REI.A.1 HSA-REI.B.3 HSN-Q.A.1 HSA-CED.A.4
Total 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: - The use of Big Ideas Math Online Resources, Kahoot, Quia, Peardeck or other types of interactive software is encouraged. - Teachers are encouraged to use electronic assessments to determine mastery of concepts taught. - Teachers are encouraged to allow students to use graphing calculators when appropriate for educational advancement. - Instructional technology should be used to present and assess lessons such as: PowerPoint, Smart Notebook, The Geometer's Sketchpad, GeoGebra, etc.					

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 21st Century Life and Career Skills: Personal Financial Literacy: All students will develop skills and strategies that promote personal and financial responsibility related to financial planning, savings, investment, and charitable giving in the global economy.

9.3 21st Century Life and Career Skills: Career Awareness, Exploration, and Preparation: All students will apply knowledge about and engage in the process of career awareness, exploration, and preparation in order to navigate the globally competitive work environment of the information age.

Unit 2: Graphing Linear Functions

Summary of the Unit: Chapter 3 extends students' introductory understanding of functions and presents function notation, representing functions, discrete and continuous functions, and evaluating functions. In this chapter, students are also introduced to two forms of linear equations such as standard and slope-intercept form.

Enduring Understanding: The study of linear functions is important as it provides students with their first experience of identifying and interpreting the relationship between two dependent variables.

Essential Questions:

- What is a function?
- How can you determine if a function is linear or nonlinear?
- How does the graph of the linear function $f(x)=x$ compare to the graphs of $g(x)=f(x)+c$ and $h(x)=f(cx)$?

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 complete and respond to the given journal entries. The Journal entries will be combined for a quarterly assessment grade.
- Students will demonstrate mastery through various assessment criteria included in the unit.

Resources:

- Big Ideas Learning Math Algebra 1 (2015)
- IXL.com
- New Jersey Student Learning Standards for Mathematics

Topic/ Selection	Suggested Timeline per topic	General Objectives	Instructional Activities	Suggested Benchmarks/ Assessments	New Jersey Student Learning Standards
Functions (3.1)	1 day	Students will determine whether relations are functions, find the domain and range of a function, and identify the independent and	Add lesson vocabulary terms/examples to notes. Exploration 1 and 2 Have students determine the	Suggested IXL to supplement/enhance lesson: Q.3, Q.4, Q.5 Teacher chosen/ created worksheets/activities with higher level examples that are	HSF-IF.A.1

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		dependent variables of a function.	domain and range of teacher created/chosen materials. Have students determine the independent/dependent variables of teacher chosen/created materials.	helpful in mastering the skills in this lesson. Closure activity to assess common misconceptions such as: Make sure students do not confuse inverse with negative when finding inverse relations. Classwork assigned including real world application problems Homework assigned	
Linear Functions (3.2)	2 days	Students will identify linear functions using graphs, tables, and equations and graph linear functions using discrete and continuous data.	Add lesson vocabulary terms/examples to notes. Have students discover ways to determine if a function is linear or not using teacher chosen/created materials. Have students discover the difference between	Suggested IXL to supplement/enhance lesson:S.1 Teacher chosen/created worksheets/activities with higher level examples that are helpful in mastering the skills in this lesson. Classwork assigned including real world application problems	HSA-REI.D.10 HSA-CED.A.2 HSF-IF.B.5 HSF-IF.C.7a HSF-LE.A.1b

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			discrete and continuous functions; then have students graph these functions using both graph paper and a graphing calculator	Homework assigned	
Function Notation (3.3)	1-2 days	Students will use function notation to evaluate and interpret functions, and use functions notation to solve and graph functions.	Add lesson vocabulary terms/examples to notes. Have students graph and solve functions using teacher chosen/created materials.	Suggested IXL to supplement/enhance lesson: Q.7, Q.8 Teacher chosen/created worksheets/activities with higher level examples that are helpful in mastering the skills in this lesson. Classwork assigned including real world application problems Closure activity to assess common misconceptions such as: $f(x)$ does not mean the product of f and x.	HSA-CED.A.2 HSF-IF.A.1 HSF-IF.A.2 HSF-IF.C.7a HSF-IF.C.9
Graphing Linear Equations in Standard Form (3.4)	2-3 days	Students will graph equations of horizontal and vertical lines.	Add lesson vocabulary terms/examples to notes.	Mini Quiz based on previous material (3.1-3.3).	HSA-CED.A.2 HSF-IF.C.7a

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		Students will graph linear equations in standard form using intercepts and solve real-life problems.	Have students graph linear equations in standard form. Then have them discover how equations for horizontal and vertical lines differ	Suggested IXL to supplement/enhance lesson: S.14 Teacher chosen/ created worksheets/activities with higher level examples that are helpful in mastering the skills in this lesson. Classwork assigned including real world application problems Homework assigned	
Graphing Linear Equations in Slope-Intercept Form (3.5)	4-5 days	Students will find the slope of a line, use the slope-intercept form of a linear equations, and use slopes and y-intercepts to solve real-life problems.	Add lesson vocabulary terms/examples to notes. Graphing Calculator Investigation: Enter equations into the Y= list to graph in the standard viewing window and introduce other functions such as the Zoom and Table functions.	Suggested IXL to supplement/enhance lesson: S.6 Teacher chosen/ created worksheets/activities with higher level examples that are helpful in mastering the skills in this lesson. Classwork assigned including real world application problems	HSA-CED.A.2 HSF-IF.B.4 HSF-IF.C.7a HSF-LE.B.5

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			Discuss Families of Graphs and have students discuss similarities and differences between the parent function and several different given linear equations using teacher chosen/ created worksheets/activities .	Homework assigned	
Transformations of Graphs Of Linear Functions (3.6)	2 days	Students will translate and reflect graphs of linear functions, stretch and shrink graphs of linear functions, and combine transformations of graphs of linear functions.	Add lesson vocabulary terms/examples to notes. Explorations 1, 2 , and 3 Use graphing calculator to help aide in determining transformations	Teacher chosen/ created worksheets/activities with higher level examples that are helpful in mastering the skills in this lesson. Classwork assigned including real world application problems	HSF-If.C.7a HSF-BF.B.3
Graphing Absolute Value Functions (3.7)	2 Days	Students will translate, stretch, shrink, and reflect graphs of absolute value functions.	Add lesson vocabulary terms/examples to notes. Connect students' understanding of the vertex of an angle to the vertex of the	Mini Quiz based on previous material. Teacher chosen/ created worksheets/activities with higher level examples that are helpful in mastering	HSA-CED.A.2 HSA-REI.D.10 HSF-IF.C.7b HSF-BF.B.3

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			graph of an absolute value equation. Have students determine the transformations on absolute value functions using teacher chosen/created worksheets or activities that include use of a graphing calculator	the skills in this lesson. Homework assigned	
Review and Assess	2 days	Students demonstrate mastery of topics and concepts presented	Chapter review using varied teacher created/chosen materials and tasks	End of Unit Test Completion of Journal Assessment	HSF-If.C.7a HSF-BF.B.3 HSA-CED.A.2 HSF-IF.B.4 HSF-LE.B.5 HSF-IF.C.9 HSA-REI.D.10
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: - The use of Big Ideas Math Online Resources, Kahoot, Quia, Peardeck or other types of interactive software is encouraged. - Teachers are encouraged to use electronic assessments to determine mastery of concepts taught. - Teachers are encouraged to allow students to use graphing calculators when appropriate for educational advancement. - Instructional technology should be used to present and assess lessons such as: PowerPoint, Smart Notebook, The Geometer's Sketchpad, GeoGebra, etc.					
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9.2 21st Century Life and Career Skills: Personal Financial Literacy: All students will develop skills and strategies that promote personal and financial responsibility related to financial planning, savings, investment, and charitable giving in the global economy.

9.3 21st Century Life and Career Skills: Career Awareness, Exploration, and Preparation: All students will apply knowledge about and engage in the process of career awareness, exploration, and preparation in order to navigate the globally competitive work environment of the information age.

Unit 3: Writing Linear Functions

Summary of the Unit: In Chapter 4, students write equations of lines in slope-intercept form given three situations: the slope and the y-intercept; the slope and a point; or two points. Also, students write and graph equations using the slope and a point, using a graph of a line, or using real world data. Students will write equations of lines in standard form, and use their equations to solve real world problems.

Enduring Understanding: The study of linear functions is important as it provides students with their first experience of identifying and interpreting the relationship between two dependent variables.

Essential Questions:

- Given the graph of a linear function, how can you write an equation of the line?
- How can you write an equation of a line when you are given the slope and a point on the line?
- How can you recognize lines that are parallel or perpendicular?
- How can you use a scatter plot and a line of fit to make conclusions about data?
- How can you use an arithmetic sequence to describe a pattern?

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 complete and respond to the given journal entries. The Journal entries will be combined for a quarterly assessment grade.
- Students will demonstrate mastery through various assessment criteria included in the unit.

Resources:

- Big Ideas Learning Math Algebra 1 (2015)
- IXL.com topics aligned with chapter content assigned by teachers as a supplement
- New Jersey Student Learning Standards for Mathematics

Topic/ Selection	Suggested Timeline per topic	General Objectives	Instructional Activities	Suggested Benchmarks/ Assessments	New Jersey Student Learning Standards
Writing Equations in Slope-Intercept Form (4.1)	1-2 days	Students will write equations in slope-intercept form and use linear equations	Add lesson vocabulary terms/examples to notes.	Suggested IXL to supplement/enhance lesson: S.7, S.8	HSA-CED.A.2 HSF-BF.A.1a HSF-LE.A.1b HSF-LE.A.2

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		to solve real-life problems.	Remind students that x and y in an equation represent any pairs of x and y values that satisfy the equation. The coordinates of the given point are one pair of these values.	Teacher chosen/ created worksheets/activities with higher level examples that are helpful in mastering the skills in this lesson.	
Writing Equations in Point-Slope Form (4.2)	2 days	Students will write an equation of a line given its slope and a point on the line. Students will write an equation of a line given two points on the line.	Add lesson vocabulary terms/examples to notes.	Suggested IXL to supplement/enhance lesson: S.18, S.19 Teacher chosen/ created worksheets/activities with higher level examples that are helpful in mastering the skills in this lesson. Closure activity to assess common misconception such as: Watch for students who fail to write both the subtraction symbol and negative symbol when they substitute negative values in the point-slope form	HSA-CED.A.2 HSF-BF.A.1a HSF-LE.A.1b HSF-LE.A.2
Writing Equations of Parallel and Perpendicular Lines (4.3)	3 days	Students will identify and write equations of parallel and perpendicular lines	Add lesson vocabulary terms/examples to notes.	Mini Quiz based on previous material (4.1-4.2).	HSA-CED.A.2 HSF-LE.A.2

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		and use parallel and perpendicular lines in real-life problems.	Graphing Calculator Investigation: Students can use calculators to check their solutions using the TRACE function	Teacher chosen/ created worksheets/activities with higher level examples that are helpful in mastering the skills in this lesson. Suggested IXL to supplement/enhance lesson: S.20, S.21	
Scatter Plots and Lines of Best Fit (4.4)	3 days	Students will interpret scatter plots, identify correlations between data sets, and use lines of fit to model data.	Add lesson vocabulary terms/examples to notes. Remind students that any prediction is only as valid as the equation used to find it. Therefore, there are as many predictions as there are equations that can be written from pairs of points.	Suggested IXL to supplement/enhance lesson: Teacher chosen/ created worksheets/activities with higher level examples that are helpful in mastering the skills in this lesson.	HSF-LE.B.5 HSS-ID.B.6a HSS-ID.B.6c HSS-ID.C.7
Analyzing Lines of Fit (4.5)	2 days	Students will use residuals to determine how well lines of fit model data, use technology to find lines of best fit, and distinguish between correlation and causation.	Add lesson vocabulary terms/examples to notes. Use graphing calculator to help aide in analyzing line of best fit	Suggested IXL to supplement/enhance lesson: Teacher chosen/ created worksheets/activities with higher level examples that are helpful in mastering	HSF-LE.B.5 HSS-ID.B.6a HSS-ID.B.6b HSS-ID.B.6c HSS-ID.C.7 HSS-ID.C.8 HSS-ID.C.9

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				the skills in this lesson.	
Arithmetic Sequences (4.6)	2 days	Students will write the terms of arithmetic sequences, graph arithmetic sequences, and write arithmetic sequences as functions.	Add lesson vocabulary terms/examples to notes. Suggested activity to research different sequences in nature and determine whether the sequence is arithmetic (example- Fibonacci Sequence)	Mini Quiz based on previous material. Suggested IXL to supplement/enhance lesson: Teacher chosen/ created worksheets/activities that require students to write the formula for the nth term of an arithmetic sequence and identify each component of the formula and any other items that are helpful in mastering the skills in this lesson.	HSF-IF.A.3 HSF-BF.A.1a HSF-BF.A.2 HSF-LE.A.2
Piecewise Functions (4.7)	1 day	Students will evaluate, write, and graph piecewise functions.	Add lesson vocabulary terms/examples to notes.	Suggested IXL to supplement/enhance lesson: Teacher chosen/ created worksheets/activities with higher level examples that are helpful in mastering the skills in this lesson.	HSA-CED.A.2 HSA-REI.D.10 HSF-IF.C.7b

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Review and Asses	2 days	Students demonstrate mastery of topics and concepts presented	Chapter review using varied teacher created/chosen materials and tasks	End of Unit Test Completion of Journal Assessment	HSA-CED.A.2 HSF-BF.A.1a HSF-LE.A.1b HSF-LE.A.2
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: - The use of Big Ideas Math Online Resources, Kahoot, Quia, Peardeck or other types of interactive software is encouraged. - Teachers are encouraged to use electronic assessments to determine mastery of concepts taught. - Teachers are encouraged to allow students to use graphing calculators when appropriate for educational advancement. - Instructional technology should be used to present and assess lessons such as: PowerPoint, Smart Notebook, The Geometer's Sketchpad, GeoGebra, etc.					
Cross Curricular/ 21st Century Connections: 9.1 21 st 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 21 st Century Life and Career Skills: Personal Financial Literacy: All students will develop skills and strategies that promote personal and financial responsibility related to financial planning, savings, investment, and charitable giving in the global economy. 9.3 21 st Century Life and Career Skills: Career Awareness, Exploration, and Preparation: All students will apply knowledge about and engage in the process of career awareness, exploration, and preparation in order to navigate the globally competitive work environment of the information age.					

Unit 4: Solving Systems of Linear Equations

Summary of the Unit: In this unit, students will differentiate between the three common techniques for solving systems of equations which include graphing, substitution, and elimination. Students will then utilize these techniques to solve systems of equations that result in either one solution, no solution, or infinitely many solutions.

Enduring Understanding: Relationships between two or more functions exist throughout the real world and it is the understanding of these concepts that allow people to (for example) calculate the cost difference between various payment plans or in figuring out when a business enterprise will break even.

Essential Questions:

- How can you use substitution to solve a system of linear equations?
- How can you use elimination to solve a system of linear equations?
- Can a system of linear equations have no solution or infinitely many solutions?
- How can you use a system of linear equations to solve an equation with variables on both sides?

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 complete and respond to the given journal entries. The Journal entries will be combined for a quarterly assessment grade.
- Students will demonstrate mastery through various assessment criteria included in the unit.

Resources:

- Big Ideas Learning Math Algebra 1 (2015)
- IXL.com topics aligned with chapter content assigned by teachers as a supplement
- New Jersey Student Learning Standards for Mathematics

Topic/ Selection	Suggested Timeline per topic	General Objectives	Instructional Activities	Suggested Benchmarks/ Assessments	New Jersey Student Learning Standards
Solving Systems of Linear Equations by Graphing (5.1)	1-2 days	Students will check solutions of systems of linear equations.	Add lesson vocabulary terms/examples to notes.	Organizational chart or other teacher created worksheets/material	HSF-IF.C.7a 7.EE.B.4b HSA-REI.B.3

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<i>Incorporate lesson 5.4</i>		Students will solve systems of linear equations by graphing. Students will use systems of linear equations to solve real-life problems.	Have students discover ways to determine if a system of equations has one solution, no solution, or infinitely many solutions through graphing using teacher chosen/created materials. Graphing Calculator Investigation: Enter equations into the Y= list to graph and CALC menu to find points of intersection Making Connections and building upon prior knowledge: Before graphing, after writing equations in slope-intercept form, have students compare slopes and intercepts. Different slopes mean the lines will intersect and there is one solution. Same slope, same intercept means they are the same line and there	s where all methods to solving systems of equations are collected and identified in order to determine best methods to solve as each lesson progresses Homework assigned Classwork assigned including real world application problems Suggested IXL to supplement/enhance lesson: U.1-U.4 Closure activity to assess common misconceptions such as: Some students may reverse the x- and y- coordinates in their solutions. Emphasize that checking their solutions will help correct such errors.	
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			are infinite solutions. Sale slope, different intercepts indicates parallel lines and no solution.		
Solving Systems of Linear Equations by Substitution (5.2) <i>Incorporate lesson 5.4</i>	1-2 days	Students will solve systems of linear equations by substitution. Students will use systems of linear equations to solve real-life problems.	Add lesson vocabulary terms/examples to notes. Have students discover ways to determine if a system of equations has one solution, no solution, or infinitely many solutions through substitution using teacher chosen/created materials.	Continuation of Organizational chart or other teacher created worksheets/materials to incorporate current solving method Suggested IXL to supplement/enhance lesson: U.8 and U.9 Closure activity to assess common misconceptions such as: Students sometimes will solve for one variable and forget to solve for the second. When asked to solve a linear system, the solution is an ordered pair. Homework assigned Classwork assigned including real world application problems	HSA-CED.A.3 HSA-REI.C.6

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Solving Systems of Linear Equations by Elimination (5.3) <i>Incorporate lesson 5.4</i>	2-3 days	Students will solve systems of linear equations by elimination. Students will use systems of linear equations to solve real-life problems	Add lesson vocabulary terms/examples to notes. Have students discover ways to determine if a system of equations has one solution, no solution, or infinitely many solutions through elimination by addition, subtraction, and multiplication using teacher chosen/created materials. When using subtraction to solve, some students may add terms rather than subtract. Suggest rewriting one equation with opposite signs and then add equations to avoid errors in subtracting.	Mini Quiz based on previous material. Continuation of Organizational chart or other teacher created worksheets/materials to incorporate current solving method Homework assigned Classwork assigned including real world application problems Suggested IXL to supplement/enhance lesson: U.10 - U.11, U.14- U.15	HSA-CED.A.3 HSA-REI.C.5 HSA-REI.C.6
Solving Equations by Graphing (5.5)	2-3 days	Students will solve linear equations by graphing.	Add lesson vocabulary terms/examples to notes. Exploration 1 and 2	Homework assigned Classwork assigned including real world application problems	HSA-CED.A.3 HSA-REI.D.11

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			Graphing Calculator Investigation: Do a check using the Y=list and GRAPH function	Teacher created worksheets/activity with higher level questions such as: Graphing to solve- $0.7x + 0.5 = -0.2x - 1.3$ and $4 x + 2 = 2x + 7 $	
Graphing Linear Inequalities in Two Variables (5.6)	2-3 days	Students will check solutions of linear inequalities. Students will graph linear inequalities in two variables.	Add lesson vocabulary terms/examples to notes. Refer to/ review rewriting equations in slope-intercept form and graphing Exploration 1,2, and 3 Graphing Calculator Investigation: Graphing Inequalities using the Y=list and SHADE in the DRAW menu	Mini Quiz based on previous material. Homework assigned Classwork assigned including real world application problems Suggested IXL to supplement/enhance lesson: T.1- T.4 Closure activity to assess common misconceptions such as: Some students may test a point on the boundary line. Remind students that a point on the boundary line cannot be used to determine which half-plane to shade.	HSA- CED. A.3 HSA-REI.D.12
Systems of Linear Inequalities (5.7)	2-3 days	Students will check, graph, and write systems of linear inequalities.	Add lesson vocabulary terms/examples to notes.	Homework assigned	HSA-CED.A.3 HSA-REI.D.12

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			Exploration 1 and 2 Graphing Calculator Investigation: Graph using the Y=list function, and SHADE in the DRAW menu.	Classwork assigned including real world application problems Have students practice and describe in words the method for determining whether to shade above or below a line when graphing an inequality, and how to determine the common solutions when graphing a system of inequalities using teacher created/chosen materials. Suggested IXL to supplement/enhance lesson: T.5 and T.6	
Review and Assess	2 days	Students demonstrate mastery of topics and concepts presented	Chapter review using varied teacher created/chosen materials and tasks	End of Unit Test Completion of Journal Assessment	HSF-IF.C.7a 7.EE.B.4b HSA-REI.B.3 HSA-CED.A.3 HSA-REI.C.6 HSA-REI.C.5 HSA-REI.D.11
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:

- The use of Big Ideas Math Online Resources, Kahoot, Quia, Peardeck or other types of interactive software is encouraged.
- Teachers are encouraged to use electronic assessments to determine mastery of concepts taught.
- Teachers are encouraged to allow students to use graphing calculators when appropriate for educational advancement.
- Instructional technology should be used to present and assess lessons such as: PowerPoint, Smart Notebook, The Geometer's Sketchpad, GeoGebra, etc.

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 21st Century Life and Career Skills: Personal Financial Literacy: All students will develop skills and strategies that promote personal and financial responsibility related to financial planning, savings, investment, and charitable giving in the global economy.

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Unit 5: Solving Linear Inequalities

Summary of the Unit: This chapter begins with an introduction to writing and graphing inequalities. Students will work with real numbers and decide whether or not a number is a solution to an inequality. Students will then write, graph, and solve multi-step inequalities that involve addition, subtraction, multiplication, and division including special cases of no solution or all real numbers. Lastly, students will use these concepts of solving and graphing individual inequalities to using the conjunction “and” or “or” to combine two inequalities when solving compound inequalities.

Enduring Understanding: Applications of inequalities often involve measurement (weight, height, length). Systems of linear inequalities result in regions producing multiple solutions to the situation presented.

Essential Questions:

- How can you use an inequality to describe a real-life statement?
- How can you use addition, subtraction, multiplication, and division to solve an inequality?
- How can you use inequalities to describe intervals on the real number line?
- How can you solve and graph an absolute value inequality and equation?

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 complete and respond to the given journal entries. The Journal entries will be combined for a quarterly assessment grade.
- Students will demonstrate mastery through various assessment criteria included in the unit.

Resources:

- Big Ideas Learning Math Algebra 1 (2015)
- IXL.com topics aligned with chapter content assigned by teachers as a supplement
- New Jersey Student Learning Standards for Mathematics

Topic/ Selection	Suggested Timeline per topic	General Objectives	Instructional Activities	Suggested Benchmarks/ Assessments	New Jersey Student Learning Standards
Writing and Graphing Inequalities (2.1)	1-2 days	Students will write linear inequalities, sketch the graphs of linear inequalities, and write linear	Add lesson vocabulary terms/examples to notes.	Closure activity to assess common misconceptions such as: $80 < p$ is equivalent to $p > 80$.	HSA-CED.A.1

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Algebra 1

		inequalities from graphs.	Exploration 1, 2 Create a chart/index cards or other teacher created materials organizing common inequality phrases and the corresponding inequality symbol. Teacher created worksheets/activities to incorporate mathematical connection involving: Writing inequalities that represent the missing dimension x of several different figures.	Suggest to students that they rewrite the inequality so that the variable is read first. Homework assigned. Classwork assigned including real world application problems Suggested IXL to supplement/enhance lesson: K.1- K.3	
Solving Inequalities using Addition or Subtraction (2.2)	1 day	Students will write, solve, and graph inequalities that involve addition and subtraction	Add lesson vocabulary terms/examples to notes. Remind students of rules for solving equations. When students solve inequalities with variables on both sides, suggest that they subtract the term with the lesser coefficient from each	Closure activity to assess common misconceptions such as: $x - (-4) > 10$. Students should first simplify the inequality and write $x + 4 > 10$. Homework assigned. Classwork assigned including real world application problems	HSA-CED.A.1 HSA-REI.B.3

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			side so the remaining coefficient of the variable will be positive. Teacher created worksheets/activities to incorporate mathematical connection involving: Writing and solving inequalities to find the possible values of x given the perimeter.	Suggested IXL to supplement/enhance lesson: K.4 - K.7	
Solving Inequalities Using Multiplication or Division(2.3)	1 day	Students will write, solve, and graph inequalities that involve multiplication and division	Add lesson vocabulary terms/examples to notes. Remind students of rules for solving equations. Remind students that $\frac{b}{7}$ is the same as $\frac{1}{7}b$. To isolate b, multiply by the reciprocal of $\frac{1}{7}$, which is 7.	Homework assigned. Classwork assigned including real world application problems Closure activity to assess common misconceptions such as: A negative sign in an inequality does not necessarily mean that the direction of the inequality should change. For example, when solving $\frac{x}{6} > -3$, do not change the direction of the inequality.	HSA-CED.A.1 HSA-REI.B.3
Solving Multi-Step Inequalities(2.4)	2-3 days	Students will use prior knowledge of	Add lesson vocabulary	Homework assigned.	HSA-CED.A.1 HSA-REI.B.3

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		solving one-step equations to solve multi-step equations involving addition, subtraction, multiplication, and division	terms/examples to notes. Remind students of rules for solving equations. Review Distributive Property using teacher created worksheets/activities . Graphing Calculator Investigation: Find the solution of an inequality in one variable. Teacher created worksheets/activities to incorporate mathematical connection involving: Writing and solving inequalities to find the possible values of x given the area of several different figures.	Classwork assigned including real world application problems Suggested IXL to supplement/enhance lesson:K.8- K.11 Closure activity to assess common misconceptions such as: Students may incorrectly assume that the solution of all inequalities in which the variable has been eliminated is the empty set. Remind students that they must simplify the inequality to see whether it is a true statement. If the inequality is true, the solution set is all real numbers. Only when the inequality is untrue is the solution set the empty set.	
Solving Compound Inequalities (2.5)	2-3 days	Students will write, graph, and solve compound inequalities containing the conjunction “and” or “or”	Add lesson vocabulary terms/examples to notes. Students can create a Venn Diagram or	Mini Quiz based on previous material. Closure activity to assess common misconceptions such as: Students often	HSA-CED.A.1 HSA-REI.B.3

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			other teacher created materials to explore the difference between statements with <i>and</i> and with <i>or</i>. For example, A triangle has three sides, <i>and</i> a hexagon has five sides. - A triangle has three sides, <i>or</i> a hexagon has five sides. Exploration 1 and 2 Using teacher created materials/activities, Students discover statements with <i>and</i> describe the intersection of two sets, while statements with <i>or</i> describe the union of two sets. For students that may continue to make calculation errors, suggest students to separate the compound inequality and solve the inequalities separately until they	believe that the graph of an “and” compound inequality is a segment (with open or closed endpoints) and the graph of an “or” compound inequality is two rays in opposite directions (with open or closed endpoints). There are other possibilities. Homework assigned. Classwork assigned including real world application problems Suggested IXL to supplement/enhance lesson: K.12- K.14	
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			are familiar with the solution process.		
Solving Absolute Value Inequalities (2.6)	2-3 days	Students will solve absolute value inequalities and use absolute value inequalities to solve real-life problems.	Add lesson vocabulary terms/examples to notes. Have students discover the various values that can make an absolute value inequality true. Reinforce the idea that absolute value inequalities have two solutions. Exploration 1, 2, 3 Teacher created worksheets/activities to incorporate mathematical connection involving: Area and perimeter of figures	Homework assigned. Classwork assigned including real world application problems Suggested IXL to supplement/enhance lesson:L. 3 Closure activity/Investigation : Address confused students about why $t + 5 < 9$ is rewritten as $t + 5 < 9$ and $t + 5 > -9$. An alternative method is to rewrite the inequality as $t + 5 < 9$ and $-(t + 5) < 9$. This method makes the switch of the direction of the inequality more obvious.	HSA-CED.A.1 HSA-REI.B.3
Review and Assess	2 Days	Students demonstrate mastery of topics and concepts presented.	Chapter review using varied teacher created/chosen materials and tasks.	End of Unit Test Completion of Journal Assessment	HSA-CED.A.3 HSA-REI.D.12 HSA-CED.A.2 HSA-REI.D.10 HSF-IF.C.7b HSF-BF.B.3
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Unit 6: Exponential Functions and Sequences

Summary of the Unit: In this unit students will be introduced to exponential functions and sequences. 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. Geometric sequences are introduced with the connection made to exponential 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 6.
- Students will complete and respond to the given journal entries. The Journal entries will be combined for a quarterly assessment grade.
- Students will demonstrate mastery through various assessment criteria included in the unit.

Resources:

- Big Ideas Learning Math Algebra 1 (2015)
- IXL.com topics aligned with chapter content assigned by teachers as a supplement
- New Jersey Student Learning Standards for Mathematics

Topic/ Selection	Suggested Timeline per topic	General Objectives	Instructional Activities	Suggested Benchmarks/ Assessments	New Jersey Student Learning Standards
Properties of Exponents (6.1)	2-3 days	Students will use zero and negative exponents	Suggested: Class will make group chart for wall with different	Homework assigned.	HSA-CED.A.1 HSA-REI.B.3

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		Students will use the properties of exponents to simplify expressions Students will solve real-life problems involving exponents	properties of exponents Incorporate Motivate questions and Exploration 1 Teacher created worksheets/activities to incorporate mathematical connection involving: scientific notation	Classwork assigned including real world application problems Suggested IXL to supplement/enhance lesson: V.1-8 Closure activity/Investigation : Discuss misconception of power of a product and power of quotient as distributing which it is not Mini-Assessment suggested	
Radicals and Rational Exponents (6.2)	1-2 days	Students will find the <i>n</i>th roots Students will evaluate expressions with rational exponents Students will solve real-life problems involving rational exponents	Add lesson vocabulary terms/examples to notes. Use graphing calculator to find approximation of non-perfect squares Exploration 1 and 2	Homework assigned. Classwork assigned including real world application problems Suggested IXL to supplement/enhance lesson: V.10 Closure activity/Investigation : Make sure students read and	HSN.RN.A.1 HSN.RN.A.2

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				Correctly and understand why the solutions are the same.	
Exponential Functions (6.3)	1-2 days	Students will identify and evaluate exponential functions Students will graph exponential functions Students will solve real-life problems involving exponential functions	Add lesson vocabulary terms/examples to notes. Graph exponential functions from tables made by finding the common difference	Homework assigned. Classwork assigned including real world application problems Suggested IXL to supplement/enhance lesson: X.2 Closure activity/Investigation : Is there a way to determine the y-intercept from the equation as with linear equations?	HSA-CED.A.2 HSF-IF.B.4 HSF-IF.C.7e HSF-IF.C.9 HSF-BF.A.1a HSF-BF.B.3 HSF-LE.A.1a HSF-LE.A.2
Exponential Growth and Decay (6.4)	2-3 days	Students will use and identify exponential growth and decay functions Students will interpret and rewrite exponential growth and decay functions	Add lesson vocabulary terms/examples to notes on growth and decay functions Graph exponential functions from tables made by finding the common difference	Homework assigned. Classwork assigned including real world application problems Suggested IXL to supplement/enhance lesson: X.3	HSA-SSE.B.3c HSA-CED.A.2 HSF-IF.C.7e HSF-IF.C.8b HSF-BF.A.1a HSF-LE.A.1c HSF-LE.A.2

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		Students will solve real-life problems involving exponential growth and decay	Graph exponential functions using graphing calculator Determine parts of compound interest formula and solve using graphing calculator	Closure activity/Investigation : Suggested: M&M lab on growth and decay functions	
Geometric Sequences (6.6)	1-2 days	Students will identify geometric sequences Students will extend and graph geometric sequences Students will write geometric sequences as functions	Add lesson vocabulary terms/examples to notes. Solve geometric sequences using a graphing calculator	Homework assigned. Classwork assigned including real world application problems Suggested IXL to supplement/enhance lesson: P.3 & P.6 Closure activity/Investigation : What information is needed to write the nth term of the geometric sequences?	HSF-IF.A.3 HSF-BF.A.2 HSF-LE.A.2
Review and Assess	2-3 Days	Students demonstrate mastery of topics and concepts presented.	Chapter review using varied teacher created/chosen materials and tasks.	End of Unit Test Completion of Journal Assessment	HS-N-RN.A.1 HS-N-RN.A.2 HSA-CED.A.2 HSF-IF.B.4 HSF-IF.C.7e HSF-IF.C.9

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					HSF-BF.A.1a HSF-BF.B.3 HSF-LE.A.1a HSF-LE.A.2 HSA-SSE.B.3c HSF-IF.C.8b HSF-LE.A.1C HSA-REI.D.11
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Unit 7: Polynomial Equations 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 complete and respond to the given journal entries. The Journal entries will be combined for a quarterly assessment grade.

Students will demonstrate mastery through various assessment criteria included in the unit.

Resources:

- Big Ideas Learning Math Algebra 1 (2015)
- IXL.com topics aligned with chapter content assigned by teachers as a supplement
- Common Core Standards for Mathematics

Topic/ Selection	Suggested Timeline per topic	General Objectives	Instructional Activities	Suggested Benchmarks/ Assessments	New Jersey Student Learning Standards
Adding and Subtracting Polynomials (7.1)	1-2 days	Students will find the degrees of monomials Students will classify polynomials Students will add	Add lesson vocabulary terms/examples to notes. Make a chart for degree of polynomials	Homework assigned. Classwork assigned including real world application problems Suggested IXL to supplement/enhance	HSA-APR.A.1

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		and subtract polynomials Students will solve real-life problems that involve polynomials		lesson: Z.3-5 Closure activity/Investigation: Why do you leave spaces when adding or subtracting in a vertical format?	
Multiplying Polynomials (7.2)	1-2 days	Students will multiply polynomials Students will apply distributive property to write polynomials in standard form Students will multiply binomials and trinomials	Add lesson vocabulary terms/examples to notes. Review distributive property and how it is applied in all methods of multiplying polynomials	Homework assigned. Classwork assigned including real world application problems Suggested IXL to supplement/enhance lesson: Z.6 Closure activity/Investigation: real-life investigation on the area of a trapezoid on a hockey rink	HSA-APR.A.1
Special Products of polynomials (7.3)	2-3 days	Students will apply the square of a binomial pattern of polynomials Students will apply the sum and difference pattern	Add lesson vocabulary terms/examples to notes. Practice finding special products using whiteboards to	Homework assigned. Classwork assigned including real world application problems Suggested IXL to supplement/enhance	HSA-APR.A.1

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		of polynomials Students will apply special product patterns to solve real-life problems	show the difference in types of special products	lesson: Z.9 Closure activity/Investigation: demonstrate how to use algebra tiles to represent binomial patterns	
Solving Polynomial Equations in Factored Form (7.4)	2-3 days	Students will solve polynomials using Zero-Product Property Students will factor polynomials using the greatest common factor Students will apply to Zero-Product Property to solve real-life problems	Add lesson vocabulary terms/examples to notes. Make chart of polynomial expressions and equations to identify greatest common factor	Unit Quiz sections 1-4 Homework assigned. Classwork assigned including real world application problems Closure activity/Investigation: Suggested: Vertical Motion Model task card activity	HSA-APR.B.3 HSA-REI.B.4b
Factoring $x^2 + bx + c$ (7.5)	2-3 days	Students will factor trinomials of the form $x^2 + bx + c$ Students will factor trinomials to solve real-life problems	Create Multiply/Add tables to create lists of possible factor solutions Add lesson vocabulary terms/examples to notes.	Homework assigned. Classwork assigned including real world application problems Suggested IXL to supplement/enhance lesson: AA.3 Closure	HSA-SSE.A.2 HSA-SSE.B.3a

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				activity/Investigation: how can you visually represent polynomials in factored form	
Factoring $ax^2 + bx + c$ (7.6)	2-3 days	Students will factor trinomials of the form $ax^2 + bx + c$ Students will factor trinomials to solve real-life problems	Expand Multiply/Add table to create lists of possible factor solutions- multiply a&c Foldable activities suggested Add lesson vocabulary terms/examples to notes.	Homework assigned. Classwork assigned including real world application problems Suggested IXL to supplement/enhance lesson: AA.4 Closure activity/Investigation: discuss using box method to factor polynomials	HSA-SSE.A.2 HSA-SSE.B.3a
Factoring Special Products (7.7)	1-2 days	Students will factor difference of two squares Students will factor perfect square trinomials Students will use factoring to solve real-life problems	Add lesson vocabulary terms/examples to notes. Use whiteboards to show differences in two types of perfect square trinomials	Homework assigned. Classwork assigned including real world application problems Suggested IXL to supplement/enhance lesson: AA.5 Closure activity/Investigation: mini-assessment	HSA-SSE.A.2 HSA-SSE.B.3a

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Factoring Polynomials Completely (7.8)	2-3 days	Students will factor polynomials by grouping Students will factor polynomials completely Students will use factoring to solve real-life problems	Write out steps to complete in order to factor completely Add lesson vocabulary terms/examples to notes.	Homework assigned. Classwork assigned including real world application problems Suggested IXL to supplement/enhance lesson: AA.7-8 Closure activity/Investigation: "I have... Who has?" activity	HSA-SSE.A.2 HSA-SSE.B.3a
Review and Assess	2-3 Days	Students demonstrate mastery of topics and concepts presented.	Chapter review using varied teacher created/chosen materials and tasks.	End of Unit Test Completion of Journal Assessment	HSA-APR.A.1 HSA-APR.B.3 HSA-REI.B.4b HSA-SSE.A.2 HSA-SSE.B.3a
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Unit 8: Graphing Quadratic Functions

Summary of the Unit: In this unit students will focus on graphing quadratic functions in multiply forms and comparing them to the parent graph. Students will make connections to transformations of functions that was previously learned. Students will also be introduced to the concept of zeros of functions and connected to the x-intercept of the graph. Finally, students will compare behaviors of linear, exponential and quadratic functions.

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:

- What can you determine of the behavior of a graph for a quadratic equation?
- How can you determine if a set of numbers is linear, exponential or quadratic?

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 complete and respond to the given journal entries. The Journal entries will be combined for a quarterly assessment grade.
- Students will demonstrate mastery through various assessment criteria included in the unit.

Resources:

- Big Ideas Learning Math Algebra 1 (2015)
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- New Jersey Student Learning Standards for Mathematics

Topic/ Selection	Suggested Timeline per topic	General Objectives	Instructional Activities	Suggested Benchmarks/ Assessments	New Jersey Student Learning Standards
Graphing $f(x) = ax^2$ (8.1)	2-3 days	Students will identify characteristics of quadratic functions	Make poster of basics of quadratic function graphs (parent	Homework assigned. Classwork assigned	HSA-CED.A.2 HSF-IF.C.7a HSF-BF.B.3

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		Students will graph and identify transformations of quadratic functions of the form $f(x)=ax^2$	function) & identify key terms and parts of a quadratic function Add lesson vocabulary terms/examples to notes. Use a graphing calculator to identify transformations of the quadratic function	including real world application problems Closure activity/Investigation: how does the value of a change the quadratic function	
Graphing $f(x)=ax^2+c$ (8.2)	2-3 days	Students will graph and identify transformations of quadratic functions of the form $f(x)=ax^2+c$ Students will solve real-life problems involving functions of the form $f(x)=ax^2+c$	Expand poster on quadratic functions with the transformation of c value- overlap parent function Add lesson vocabulary terms/examples to notes. Use a graphing calculator to identify transformations of the quadratic functions	Homework assigned. Classwork assigned including real world application problems Suggested IXL to supplement/enhance lesson: BB.1 Closure activity/Investigation: What does the value of c do to the parent graph	HSA-CED.A.2 HSF-IF.C.7a HSF-BF.B.3
Graphing $f(x)=ax^2+bx+c$ (8.3)	2-3 days	Students will graph and identify	Add lesson vocabulary	Unit Quiz	HSA-CED.A.2 HSF-IF.C.7a

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		transformations of quadratic functions of the form $f(x)=ax^2+bx+c$ Students will find maximum and minimum values of quadratic functions	terms/examples to notes. Use a graphing calculator to identify transformations of the quadratic functions Interactive notebook activity on all graphing transformations as well as finding the maximum and minimum using the CALC function	Homework assigned. Classwork assigned including real world application problems Suggested IXL to supplement/enhance lesson: BB.2 Closure activity/Investigation: Graphing calculator activity on finding maximums and minimums as well as zeros	HSF-IF.C.9
Graphing $f(x)=a(x-h)^2+k$ (8.4)	2-3 days	Students will identify odd and even functions Students will graph quadratic functions of the form $f(x)=a(x-h)^2$ Students will graph quadratic functions of the form $f(x)=a(x-h)^2+k$ Students will model real-life problems using the form $f(x)=a(x-h)^2$	Add lesson vocabulary terms/examples to notes. Create graphic organizer to help organize attributes of functions they are comparing Use a graphing calculator to explain the difference in the change of k	Homework assigned. Classwork assigned including real world application problems Closure activity/Investigation: How does vertex form help identify parts of a quadratic function	HSA-CED.A.2 HSF-IF.B.4 HSF-BF.A.1a HSF-BF.B.3

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Using Intercept Form (8.5)	2-3 days	Students will graph quadratic functions of the form $f(x) = (x-p)(x-q)$ Students will use intercept form to find zeros of the functions Students will use characteristics to graph and write quadratic functions	Interactive notebook foldable on all forms of quadratic functions that includes graphs and solutions Add lesson vocabulary terms/examples to notes. Use a graphing calculator to identify zeros of a function using CALC function	Homework assigned. Classwork assigned including real world application problems Suggested IXL to supplement/enhance lesson: BB.5-6 Closure activity/Investigation: Why is it important to master factoring polynomials	HSA-SSE.B.3a HSA-APR.B.3 HSA-CED.A.2 HSF-IF.B.4 HSF-IF.C.8a HSF-BF.A.1a
Comparing Linear, Exponential and Quadratic Functions (8.6)	2-3 days	Students will choose functions to model data Students will write functions to model data Students will compare functions using average rate of change Students will solve real-life problems involving different function types	Create chart on all three types of functions that includes parent equation and graph; discuss similarities and differences of all three forms Add lesson vocabulary terms/examples to notes. Graph all three types of functions using the graphing calculator to check the written	Homework assigned. Classwork assigned including real world application problems Suggested IXL to supplement/enhance lesson: CC.1-3 Closure activity/Investigation: mini-assessment	HSF-IF.B.6 HSF-BF.A.1a HSF-LE.A.3

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			form of the functions		
Review and Assess	2-3 Days	Students demonstrate mastery of topics and concepts presented.	Chapter review using varied teacher created/chosen materials and tasks.	End of Unit Test Completion of Journal Assessment	HSA-CED.A.2 HSA-SSE.B.3a HSA-APR.B.3 HSF-IF.B.4 HSF-IF.C.8a HSF-BF.A.1a HSF-IF.C.7a HSF-BF.B.3 HSF-IF.C.9 HSF-IF.B.6 HSF-LE.A.3
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9.2 21st Century Life and Career Skills: Personal Financial Literacy: All students will develop skills and strategies that promote personal and financial responsibility related to financial planning, savings, investment, and charitable giving in the global economy.

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Unit 9: Solving Quadratic Equations

Summary of the Unit: In this unit students will focus on solving quadratic functions using different techniques depending on how the function is written. Students will also simplify expressions that contain square roots. This unit presents different ways in which quadratics can be solved: graphing, using square roots, completing the square, and using the Quadratic formula. Students learn to distinguish between finding the zero of a function and finding the x-intercept of a graph.

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:

- Why do you get two solutions when solving a quadratic equation?
- How can you determine which method is best for solving a quadratic function?

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 complete and respond to the given journal entries. The Journal entries will be combined for a quarterly assessment grade.
- Students will demonstrate mastery through various assessment criteria included in the unit.

Resources:

- Big Ideas Learning Math Algebra 1 (2015)
- IXL.com topics aligned with chapter content assigned by teachers as a supplement
- New Jersey Student Learning Standards for Mathematics

Topic/ Selection	Suggested Timeline per topic	General Objectives	Instructional Activities	Suggested Benchmarks/ Assessments	New Jersey Student Learning Standards
Properties of Radicals (9.1)	2-3 days	Students will use properties of radicals to simplify expressions	Add lesson vocabulary terms/examples to notes.	Homework assigned. Classwork assigned including real world	HSN-RN.A.2 HSN.RN.B.3

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		Students will simplify expressions by rationalizing the denominator Students will perform operations with radicals	Create flashcards of factors to add in simplifying expressions under radical sign Use graphing calculator to estimate radicals that are non-perfect squares	application problems Suggested IXL to supplement/enhance lesson: EE.1-4 Closure activity/Investigation: what is the difference between a cube root and a square root	
Solving Quadratic Equations by Graphing (9.2)	2-3 days	Students will solve quadratic equations by graphing Students will use graphs to find and approximate the zeros of functions Students will solve real-life problems using graphs of quadratic functions	Create a table of number of possible solutions based on the graph of the quadratic function Add lesson vocabulary terms/examples to notes.	Homework assigned. Classwork assigned including real world application problems Suggested IXL to supplement/enhance lesson: Closure activity/Investigation: Graphing Calculator activity on finding solutions	HSA-REI.D.11 HSF-IF.C.7a
Solving Quadratic Equations using Square Roots (9.3)	2-3 days	Students will solve quadratic equations using square roots Students will approximate the solutions of	Create a table of the number of solutions based on the value of d Add lesson vocabulary terms/examples to	Unit Quiz Homework assigned. Classwork assigned including real world application problems	HSA-CED.A.1 HSA-CED.A.4 HSA-REI.B.4b

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		quadratic equations	notes. Use graphing calculator to find square roots of non-perfect squares	Suggested IXL to supplement/enhance lesson: BB.4 Closure activity/Investigation: mini-assessment	
Solving Quadratic Equations by Completing the Square (9.4)	2-3 days	Students will complete the square for expressions of the form $x^2 + bx$ Students will solve quadratic equations by completing the square Students will find and use maximum and minimum values Students will solve real-life problems by completing the square	Create visual representation of completing the square using algebra tiles Add lesson vocabulary terms/examples to notes. Use graphing calculator to find square roots of non-perfect squares	Homework assigned. Classwork assigned including real world application problems Suggested IXL to supplement/enhance lesson: BB.7-8 Closure activity/Investigation: how is completing the square similar to using square roots	HSA-SSE.B.3b HSA-CED.A.1 HSA-REI.B.4a HSA-REI.B.4b HSF-IF.C8a
Solving Quadratic Equations Using the Quadratic Formula (9.5)	2-3 days	Students will solve quadratic equations using the Quadratic Formula Students will interpret the	Use whiteboards or Communicators to fill in parts of Quadratic Formula Add lesson vocabulary terms/examples to	Homework assigned. Classwork assigned including real world application problems Suggested IXL to	HSA-CED.A.1 HSA-REI.B.4a HSA-REI.B.4b

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		discriminant Students will choose efficient methods for solving quadratic equations	notes. Use graphing calculator to find solutions using the Quadratic Formula	supplement/enhance lesson: BB.9-10 Closure activity/Investigation: mini-assessment	
Review and Assess	2-3 Days	Students demonstrate mastery of topics and concepts presented.	Chapter review using varied teacher created/chosen materials and tasks.	End of Unit Test Completion of Journal Assessment	HSN-RN.A.2 HSN.RN.B.3 HSA-REI.D.11 HSF-IF.C.7a HSA-CED.A.1 HSA-CED.A.4 HSA-REI.B.4b HSF-IF.C8a HSA-SSE.B.3b HSA-REI.B.4a
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Unit 10: Radical Functions and Equations***OPTIONAL***

Summary of the Unit: This chapter introduces radical functions, both square root and cubic functions. The transformation of the parent function gives students another opportunity to examine horizontal and vertical translations, horizontal reflections in the x-axis, and vertical stretches and shrinks.

Enduring Understanding: Students will connect and extend upon their knowledge of rational expressions and functions that can be applied in the real world.

Essential Questions:

- How are radical expressions represented?
- What are the characteristics of square root functions?
- How can you solve a radical expression?

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 complete and respond to the given journal entries. The Journal entries will be combined for a quarterly assessment grade.
- Students will demonstrate mastery through various assessment criteria included in the unit.

Resources:

- Big Ideas Learning Math Algebra 1 (2015)
- IXL.com topics aligned with chapter content assigned by teachers as a supplement
- New Jersey Student Learning Standards for Mathematics

Topic/ Selection	Suggested Timeline per topic	General Objectives	Instructional Activities	Suggested Benchmarks/ Assessments	New Jersey Student Learning Standards
Graphing Square Root Functions (10.1)	1-2 days	Students will graph square root functions	Create a poster of transformations of square root graphs	Homework assigned.	HSA-CED.A.2 HSF-IF.B.4 HSF-IF.B.6 HSF-IF.C.7b

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		Students will compare square root functions using average rates of change Students will solve real-life problems involving square root functions	Add lesson vocabulary terms/examples to notes. Use graphing calculator to graph a square root function	Classwork assigned including real world application problems Suggested IXL to supplement/enhance lesson: Closure activity/Investigation: what is the difference between the graph of a quadratic function and a square root graph	HSF-IF.C.9
Graphing Cube Root Functions (10.2)	1-2 days	Students will graph cube root functions Students will compare cube root functions using average rates of change Students will solve real-life problems involving cube root functions	Create table of transformations of cube root graphs Add lesson vocabulary terms/examples to notes. Use graphing calculator to graph a cube root function	Homework assigned. Classwork assigned including real world application problems Suggested IXL to supplement/enhance lesson: Closure activity/Investigation: what is the difference between the graph of a cubic function and a cube root graph Unit Quiz if needed	HSA-CED.A.2 HSF-IF.B.4 HSF-IF.B.6 HSF-IF.C.7b HSF-IF.C.9

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Solving Radical Equations (10.3)	2-3 days	Students will solve radical equations Students will identify extraneous solutions Students will solve real-life problems involving radical equations	Add lesson vocabulary terms/examples to notes. Use graphing calculator to aide in solving a radical function	Homework assigned. Classwork assigned including real world application problems Suggested IXL to supplement/enhance lesson: FF.3-4 Closure activity/Investigation: mini-assessment	HSA-CED.A.1
Inverse of a Function (10.4)	2-3 days	Students will find inverses of relations Students will explore inverses of functions Students will find inverses of functions algebraically Students will find inverses of nonlinear functions	Create tables and graphs of inverse functions Use graphing calculator to graph inverse functions Add lesson vocabulary terms/examples to notes.	Homework assigned. Classwork assigned including real world application problems Suggested IXL to supplement/enhance lesson: Closure activity/Investigation: how does an inverse change a function	HSF-BF.B.4a
Review and Assess	2-3 Days	Students demonstrate mastery of topics and concepts presented.	Chapter review using varied teacher created/chosen materials and tasks.	End of Unit Test Completion of Journal Assessment	HSA-CED.A.2 HSF-IF.B.4 HSF-IF.B.6 HSF-IF.C.7b HSF-IF.C.9 HSF-BF.B.4a

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Unit 11: Data Analysis and Displays***OPTIONAL***

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?
- How can collecting and analyzing data help you make decisions and predictions?
- 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 11.
- Students will complete and respond to the given journal entries. The Journal entries will be combined for a quarterly assessment grade.
- Students will demonstrate mastery through various assessment criteria included in the unit.

Resources:

- Big Ideas Learning Math Algebra 1 (2015)
- IXL.com topics aligned with chapter content assigned by teachers as a supplement
- Common Core Standards for Mathematics

Topic/ Selection	Suggested Timeline per topic	General Objectives	Instructional Activities	Suggested Benchmarks/ Assessments	New Jersey Student Learning Standards
Measures of Center and Variation (11.1)	1-2 days	Students will compare the mean, median	Create set of data from classroom driven data	Homework assigned.	HSS-ID.A.3

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		and mode of a data set Students will find the range and standard deviation of a data set Students will identify the effects of transformations on data	Add lesson vocabulary terms/examples to notes. Use graphing calculator to aide in finding measures of central tendency and variation	Classwork assigned including real world application problems Suggested IXL to supplement/enhance lesson: KK.1 Closure activity/Investigation: what is the difference between mean, median and mode?	
Box-and-Whisker Plots (11.2)	1-2 days	Students will use box-and-whisker plots to represent data sets Students will interpret box-and-whisker plots Students will use box-and-whisker plots to compare data sets	Create box-and-whisker plots from price of televisions Add lesson vocabulary terms/examples to notes.	Homework assigned. Classwork assigned including real world application problems Suggested IXL to supplement/enhance lesson: N.5 Closure activity/Investigation: why can box-and-whisker plots can be skewed left or right	HSS-ID.A.1 HSS-ID.A.3
Shapes of Distributions (11.3)	2-3 days	Students will describe the shapes of data distributions	Create histogram from data on raffle tickets	Homework assigned.	HSS-ID.A.1 HSS-ID.A.2 HSS-ID.A.3

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		Students will use the shapes of data distributions to choose appropriate measures Students will compare data distributions	Add lesson vocabulary terms/examples to notes.	Classwork assigned including real world application problems Suggested IXL to supplement/enhance lesson: N4 Closure activity/Investigation: what are the differences between a histogram and a bar graph	
Two-Way Tables (11.4)	1-2 days	Students will find and interpret marginal frequencies Students will make two-way tables Students will find relative and conditional relative frequencies Students will use two-way tables to recognize associations in data	Create a class frequency table on class driven data Add lesson vocabulary terms/examples to notes.	Homework assigned. Classwork assigned including real world application problems Suggested IXL to supplement/enhance lesson: Closure activity/Investigation: What is the difference between joint frequency and marginal frequency	HSS-ID.B.5
Choosing a Data Display (11.5)	1-2 days	Students will classify data as quantitative or qualitative	Compare different graphs and why they	Homework assigned.	HSS-ID.A.1

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		Students will choose and create appropriate data displays Students will analyze misleading graphs	are each appropriate type of data Add lesson vocabulary terms/examples to notes.	Classwork assigned including real world application problems Suggested IXL to supplement/enhance lesson: N.1-3 Closure activity/Investigation: What is the difference between qualitative data and quantitative data	
Review and Assess	2-3 Days	Students demonstrate mastery of topics and concepts presented.	Chapter review using varied teacher created/chosen materials and tasks.	End of Unit Test Completion of Journal Assessment	HSS-ID.A.1 HSS-ID.A.2 HSS-ID.A.3 HSS-ID.B.5

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