

Black Horse Pike Regional School District Curriculum Template

ENGAGING STUDENTS ● FOSTERING ACHIEVEMENT ● CULTIVATING 21ST CENTURY GLOBAL SKILLS

Course Name: Algebra 1 ELL

Course Number: 031300

PART I: UNIT RATIONALE

WHY ARE STUDENTS LEARNING THIS CONTENT AND THESE SKILLS?

Course Title: Algebra 1 / Solving Linear Equations	Unit Summary: In this unit, students will explore the foundational skills related to solving linear equations and the connected skills of solving absolute value equations and rewriting equations and formulas. Most students will have prior experience with the Properties of Equality and techniques presented in the first three sections. It will sound familiar that whatever operation is performed on one side of the equations, the same operations must be performed on the other side of the equations to keep equality, or balance. The fourth section of the chapter applies the techniques of equation solving to the context of absolute value equations. Understanding absolute value as a function concept and not simply two vertical lines can be challenging for students. Solving literal equations in the last section requires students to see the structure of equations and perform operations on variable terms as they would perform operations on constants. Essential to success in this chapter is accuracy in computation.
Grade Level: 9-10	
Essential Question(s): ● How can you use simple equations to solve real-life problems? ● How can you use multi-step equations to solve real-life problems? ● How can you solve an equation that has variables on both sides? ● How can you solve an absolute value equation? ● How can you use a formula for one measurement to write a formula for a different measurement?	Enduring Understanding(s): Students will be able to: ● Solve simple equations. ● Solve multi-step equations. ● Solve equations with variables on both sides. ● Solve absolute value equations. ● Rewrite literal equations. ● Rewrite formulas.

PART II: INSTRUCTIONAL STRATEGIES AND RESOURCES

DESCRIBE THE LEARNING TARGETS.

After each target, identify the New Jersey Student Learning Standards that are applicable

<u>Learning Target</u> 1. Solve multi-step equations and equations with variables on both sides. [Standard] - Create equations and inequalities in one variable and use them to solve problems. [Standard] - Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method. [Standard] - Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters. [Standard] - Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.	<u>NJSLS:</u> 1. <i>NJSLS-A-CED.A.1, NJSLS-A-REI.A.1, NJSLS-A-REI.B.3, NJSLS-N-Q.A.1,</i>
2. Solve absolute value equations. [Standard] - Create equations and inequalities in one variable and use them to solve problems. [Standard] - Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.	2. <i>NJSLS-A-CED.A.1, NJSLS-A-REI.B.3</i>
3. Rewrite literal equations and formulas. [Standard] - Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations.	3. <i>NJSLS-A-CED.A.4</i>

Key Vocabulary necessary for ELL students for this chapter

Less More Profit Sum Quotient Three times Two times Twice Inverses Equivalent expression equivalent equations Solution of an equation

Inter-Disciplinary Connections:

Real-World problem solving examples:

Olympic Runners (p. 6) Provide $d=rt$. Highlight the distance and time provided in the problem for students.

Temperatures (p. 7) Provide students with variable "T". Provide words example of what the problem is asking. Define "fell" for students.

Amusement Parks (p. 8) Dictate in writing that the original price of an amusement ticket is \$44. Highlight \$12.95 less. Define "discounted" for students.

CD Costs (p. 9) Define "same," "original" and "sale" for students.

Club Profits (p. 15) Write out words for equation. Provide variable and that it represents attendance.

Summer Earnings (p. 17) Define "per hour," "per week," and "per day" for students.

Pool Depth (p. 17) Define "length" and "deep" for students.

Flags (p. 17) Define "perimeter" and "dimensions" for students.

Boat Speeds (p. 22) Define "upstream" and "current" for students.

Movie Rentals (p. 23) Clarify that one is solving for "r" for students.

Internet Fees (p. 23) Provide students with left side of the equation so they can follow the model to set up the right side of the equation.

Distance to the Sun (p. 32) Define "absolute value" for students. Require only part b of question.

Irrigation System (p. 37) Define "area," "assessed," "lot" and "width" for students. Provide Area formula.

Temperature (p. 38) Provide temperature formulas. Visualize difference with thermometer.

Truck Driving (p. 39) Define "freight" for students. Provide distance formula.

Sale Price (p. 41) Identify sale price, list price and discount. Model problem "a" and do cooperatively.

Interest Rates (p. 41) Define "interest" and "annual" for students Provide interest rate formula.

Inter-Disciplinary problem solving examples:

Investments (p. 9) Define "balance" for students and set up formula for students to solve.

Batting Averages (p. 10) Require only part "a" of problem.

Biking (p. 14) Define "mean" for students and determine mean with students before requiring the rest of the steps for the problem.

Tennis (p. 17) Define "perimeter" and "dimensions" for students.

Cheerleading (p. 29) Define "minimum," "maximum" and "absolute value" for students.

Soccer (p. 33) Define "minimum," "maximum" and "vary" for students.

Football (p. 41) Define "passes" for students.

Physics (p. 41) Highlight variable that is to be solved and complete first step for students.

Students will engage with the following text, resources and tools:

Text:

- Algebra 1, A Common Core Curriculum – Big Ideas Math, *Big Ideas Learning LLC., 2019*
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Online Resources incorporated through the year, include but not limited to:

- BigIdeasMath.com – publisher on-line assignments, resources and text
- Desmos – online graphing tool
- ALEKS – web-based artificially intelligent software
- IXL – web-based software
- G Suite for education – Google Classroom, Docs, Drive, Mail, etc...

Calculators:

- TI – 84 Plus graphing calculator

The following 21st century skills and the 8 mathematical practices are embedded throughout the course and are evident in daily lessons, assignments, activities, assessments and projects:

21st Century skills:

- Critical thinking
- Creativity
- Collaboration
- Communication
- Information literacy
- Technology literacy
- Media literacy
- Flexibility
- Leadership
- Initiative
- Productivity
- Social skills

Mathematical Practices:

- Make sense of problems and persevere in solving them
- Reason abstractly and quantitatively
- Construct viable arguments and critique the reasoning of others
- Model with mathematics
- Use appropriate tools strategically
- Attend to precision
- Look for and make use of structure
- Look for and express regularity in repeated reasoning

Students will write:

Students will define and compare/contrast given terms. Students will express their knowledge and skills in their own words, organize their thinking about the content, and write explanations to solve problems. Students will also relate real world situations using algebra terminology.

PART III: TRANSFER OF KNOWLEDGE AND SKILLS

DESCRIBE THE LEARNING EXPERIENCE.

How will students uncover content and build skills?

Opportunities for developing students' understanding in this chapter include: investigating algebra activities, problem solving workshops, modeling examples, using real-life application or other hands on activities such as projects. Technology such as animated algebra, Smart Board, and graphing calculators will also be explored through the learning experience. Other interests could include, but is not limited to alternative lesson openers, using note-taking strategies, math and history applications, and interdisciplinary applications.

Suggested warm-up activities, instructional strategies/activities, and assignments:

Section 1.1 Solving Simple Equations:

Warm-up/Starting Options	Explorations p. T-3
Practice and Apply	p. 8-10 #1-4, 5-45 (odd only), 50, 58-65
Resources	Online Dynamic Classroom has all resources available. Review: Practice A and Practice B, Puzzle Time, Student Journal, and Skills Review Handbook Advanced: Enrichment and Extension, Cumulative Review

Section 1.2 Solving Multi-Step Equations:

Warm-up/Starting Options	Explorations p. T-11
Practice and Apply	p. 16-18 #1-44 (odd only), 57-65
Resources	Online Dynamic Classroom has all resources available. Review: Practice A and Practice B, Puzzle Time, Student Journal, and Skills Review Handbook Advanced: Enrichment and Extension, Cumulative Review

Section 1.3 Solving Equations with Variables on Both Sides:

Warm-up/Starting Options	Explorations p. T-19
Practice and Apply	p. 23-24 #1-26 (odd only), 38, 41-44
Resources	Online Dynamic Classroom has all resources available. Review: Practice 33 odd A and Practice B, Puzzle Time, Student Journal, and Skills Review Handbook Advanced: Enrichment and Extension, Cumulative Review Real Life STEM Video: Dead Reckoning

Section 1.4 Solving Absolute Value Equations:

Warm-up/Starting Options	Explorations p. T-27
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Practice and Apply	p. 32-34 #1-30 (odd only), 49, 50, 62-67
Resources	Online Dynamic Classroom has all resources available. Review: Practice A and Practice B, Puzzle Time, Student Journal, and Skills Review Handbook Advanced: Enrichment and Extension, Cumulative Review
Section 1.5 Rewriting Equations and Formulas:	
Warm-up/Starting Options	Explorations p. T-35
Practice and Apply	p. 40-42 #1-25 (odd only), 47-54
Resources	Online Dynamic Classroom has all resources available. Review: Practice A and Practice B, Puzzle Time, Student Journal, and Skills Review Handbook Advanced: Enrichment and Extension, Cumulative Review

ELL Accommodations/Modifications:

Allow editing and revision before grading. Do not grade based on language usage. Explicitly teach language objectives. Simplify language used in instruction. Provide additional instruction including reviews, drills and opportunities for re-teaching. Teach in small groups when possible. Provide visual aids to enhance key concepts. Use Graphic Organizers. Assist students to underline key words or important facts in text. Provide prompts, photocopies of notes or outlines, or highlighted texts and materials. Provide frequent checks for comprehension. Provide simplified/additional instructions. Provide opportunity for student to provide oral responses to be recorded by teacher or paraprofessional. Accept correct answers on test or worksheets in any written form such as lists, phrases, or using inventive spelling.

PART IV: EVIDENCE OF LEARNING

IDENTIFY THE METHODS BY WHICH STUDENTS WILL DEMONSTRATE THEIR UNDERSTANDING OF CONTENT AND THEIR ABILITY TO APPLY SKILLS.

IDENTIFY BLOOM'S LEVELS.



Formative Assessments:

The effectiveness of the instructional program will be based on numerous activities and strategies including the following: teacher observations, students collaborating with peers, questioning strategies, student record-keeping, quizzes, exit/admit assignments, peer/self-assessments, learning/response logs, discussions and practice presentations.

ELL Accommodations/Modifications for Formative Assessments:

Provide frequent checks for comprehension. Simplify the language and format of the assessment to match the language utilized during instruction. Provide opportunity for student to provide oral responses to be recorded by teacher or paraprofessional. Accept correct answers on test or worksheets in any written form such as lists, phrases, or using inventive spelling.

Summative Assessments:

The following assessments will be used to evaluate student learning, skill acquisition and academic achievement of the Standards of Mathematical Practice and the New Jersey Learning Standards for Mathematics listed under each chapter in the Geometry curriculum/syllabus at the conclusion of an instructional time period.

- Diagnostic Pre-Test
- Chapter Tests
- Periodic Benchmark Tests
- End-Of –Course Assessment
- Standardized Tests

ELL Accommodations/Modifications for Summative Assessments:

Allow editing and revision before grading. Do not grade based on language usage. Provide simplified/additional instructions. Provide a word bank. Provide an opportunity for the student to take the test/re-test individually with a teacher or paraprofessional. Allow for the test to be read aloud. Simplify the language and format of the assessment to match the language utilized during instruction. Allow for extended time to complete the assessment. Provide opportunity for student to provide oral responses to be recorded by teacher or paraprofessional. Accept correct answers on test or worksheets in any written form such as lists, phrases, or using inventive spelling.

Performance Assessments:

Performance Tasks, Projects, Display of Student Work

ELL Accommodations/Modifications for Performance Assessments:

Allow editing and revision before grading. Do not grade based on language usage. Provide simplified/additional instructions. Provide examples of projects. Design projects and assessment for student that require reduced sentence or paragraph composition.

Black Horse Pike Regional School District Curriculum Template

ENGAGING STUDENTS ● FOSTERING ACHIEVEMENT ● CULTIVATING 21ST CENTURY GLOBAL SKILLS

Course Name: Algebra 1 ELL

Course Number: 031300

PART I: UNIT RATIONALE

WHY ARE STUDENTS LEARNING THIS CONTENT AND THESE SKILLS?

Course Title: Algebra 1 / Solving Linear Inequalities	Unit Summary: In this unit, students will apply the techniques used in solving linear equations to solving linear inequalities. The chapter begins with an introduction to writing and graphing inequalities. Color coding and verbal models are used to help students develop confidence in writing inequalities, a necessary skill for the chapter. The graphs are used to display and check solutions. The next three lessons focus on solving increasingly complex inequalities. Tools used in developing facility with these problems include symbolic manipulation, tables, and spreadsheets. Practice with real number operations is integrated throughout. The last two lessons of the chapter introduce compound inequalities, which are necessary in solving absolute value inequalities.
Grade Level: 9-10	
Essential Question(s): ● How can you use an inequality to describe a real-life statement? ● How can you use addition or subtraction to solve an inequality? ● How can you use division to solve an inequality? ● How can you solve a multi-step inequality? ● How can you use inequalities to describe intervals on the real number line? ● How can you solve an absolute value inequality?	Enduring Understanding(s): Students will be able to: ● Write linear inequalities. ● Sketch the graphs of linear inequalities. ● Write linear inequalities from graphs. ● Solve inequalities using addition. ● Solve inequalities using subtraction. ● Use inequalities to solve real-life problems. ● Solve inequalities by multiplying or dividing by positive numbers. ● Solve inequalities by multiplying or dividing by negative numbers. ● Solve multi-step inequalities. ● Use multi-step inequalities to solve real-life problems. ● Write and graph compound inequalities. ● Solve compound inequalities. ● Use compound inequalities to solve real-life problems. ● Solve absolute value inequalities. ● Use absolute value inequalities to solve real-life problems.

PART II: INSTRUCTIONAL STRATEGIES AND RESOURCES

DESCRIBE THE LEARNING TARGETS.

After each target, identify the New Jersey Student Learning Standards that are applicable

<u>Learning Target</u> 1. Solve and graph multi-step inequalities. [Standard] - Create equations and inequalities in one variable and use them to solve problems. [Standard] - Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.	<u>NJSLS:</u> 1. <i>NJSLS-A-CED.A.1, NJSLS-A-REI.B.3,</i>
2. Solve and graph compound inequalities. [Standard] - Create equations and inequalities in one variable and use them to solve problems. [Standard] - Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.	2. <i>NJSLS-A-CED.A.1, NJSLS-A-REI.B.3</i>
3. Solve and graph absolute value inequalities. [Standard] - Create equations and inequalities in one variable and use them to solve problems. [Standard] - Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.	3. <i>NJSLS-A-CED.A.1, NJSLS-A-REI.B.3</i>

Key Vocabulary necessary for ELL students for this chapter

Inequalities Greater than Less than More than Coefficients
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Inter-Disciplinary Connections:

Real-World problem solving examples: Height Restrictions (p. 57) Define “restriction” for student. Clarify meaning of closed versus open circles. Fishing (p. 58) Define “at least” for students. Pool Temperature (p. 59) Define and/or reword “no less than” for students. Maximum Vehicle Weight (p. 59) Define “axel” for students. Model two axel problem for students and then allow students to do next two parts of problem. Subway Cost (p. 60) Clarify what the problem means with “one way rides.” Circuits (p. 64) Define “circuits” and “Watts” for students. Provide variable to students as well as clarification of what the variable represents.
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Luggage Weight (p. 65) Check as a class that the inequality sign students are using is correct before they each attempt to solve problem.

Free Shipping (p. 65) Highlight the cost of the book that is the focus of this problem.

Summer Jobs (p. 70) Define “gross pay” and “deductions” for students.

Buying Fish (p. 71) Check as a class that the inequality sign students are using is correct before they each attempt to solve problem.

Temperature (p. 71) Define “forecaster” and “predicts” for students. Clarify what is being asked in question with class.

New Carpet (p. 71) Clarify “per square feet” and “units” to ensure that students are answering question correctly.

Game Scores (p. 76) Define “sum of the differences” for students.

Account Balance (p. 77) Define “minimum balance” for students and ensure students have identified that amount before beginning problem.

Campground (p. 78) Define “membership fee” and set up left side of inequality for students.

Fire Trucks (p. 78) Define “stories” as relevant to this problem for students.

Car Wash (p. 78) Scan as a class the graph that is presented and complete parts “a” and “b” as a class before requiring students to complete “c” and “d.”

Electronic Devices (p. 84) Clarify “operating temperature.” Before student moves onto next part of problem, first part should be checked for correctness.

Mountain Elevation (p. 85) Define “elevation” and “summit” for students.

Body Temperature (p. 91) Highlight the direct question of this problem for students.

Auto Parts (p. 91) Define “gaskets” for students.

Inter-Disciplinary problem solving examples:

Weight Lifting (p. 59) Only require part “a” of question.

Bridge Building (p. 59) Define “arch” for students.

Hockey (p. 65) Check that student has chosen correct inequality sign before student begins solving problem.

Woodworking (p. 78) Provide the location of \$500 in the equation for students.

Track Times (p. 78) Remind students of how to determine average before students begin this inequality.

Essay Contest (p. 91) Define “absolute deviation” for students.

Physics (p. 91) Show in print what each variable is representing.

Students will engage with the following text, resources and tools:

Text:

- Algebra 1, A Common Core Curriculum – Big Ideas Math, *Big Ideas Learning LLC., 2019*

Online Resources incorporated through the year, include but not limited to:

- BigIdeasMath.com – publisher on-line assignments, resources and text
- Desmos – online graphing tool
- ALEKS – web-based artificially intelligent software
- IXL – web-based software
- G Suite for education – Google Classroom, Docs, Drive, Mail, etc...

Calculators:

- TI – 84 Plus graphing calculator

The following 21st century skills and the 8 mathematical practices are embedded throughout the course and are evident in daily lessons, assignments, activities, assessments and projects:

21st Century skills:

- Critical thinking
- Creativity
- Collaboration
- Communication
- Information literacy
- Technology literacy
- Media literacy
- Flexibility
- Leadership
- Initiative
- Productivity
- Social skills

Mathematical Practices:

- Make sense of problems and persevere in solving them
- Reason abstractly and quantitatively
- Construct viable arguments and critique the reasoning of others
- Model with mathematics
- Use appropriate tools strategically
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Students will define and compare/contrast given terms. Students will express their knowledge and skills in their own words, organize their thinking about the content, and write explanations to solve problems. Students will also relate real world situations using algebra terminology.

PART III: TRANSFER OF KNOWLEDGE AND SKILLS

DESCRIBE THE LEARNING EXPERIENCE.

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Suggested warm-up activities, instructional strategies/activities, and assignments:

Section 2.1 Writing and Graphing Linear Inequalities:

Warm-up/Starting Options	Explorations p. T-53
Practice and Apply	p. 58-60 #1-25, 29-36, 41-44, 60-67 (odd only)
Resources	Online Dynamic Classroom has all resources available. Review: Practice A and Practice B, Puzzle Time, Student Journal, and Skills Review Handbook Advanced: Enrichment and Extension, Cumulative Review

Section 2.2 Solving Inequalities Using Addition or Subtraction:

Warm-up/Starting Options	Explorations p. T-61
Practice and Apply	p. 65-66 #1-24, 39-46 (odd only)
Resources	Online Dynamic Classroom has all resources available. Review: Practice A and Practice B, Puzzle Time, Student Journal, and Skills Review Handbook Advanced: Enrichment and Extension, Cumulative Review Real Life STEM Video: Planning Electrical Circuits

Section 2.3 Solving Inequalities Using Multiplication or Division:

Warm-up/Starting Options	Explorations p. T-67
Practice and Apply	p. 71-72 #1-19, 21-26, 40-47(odd only)
Resources	Online Dynamic Classroom has all resources available. Review: Practice 33 odd A and Practice B, Puzzle Time, Student Journal, and Skills Review Handbook Advanced: Enrichment and Extension, Cumulative Review

Section 2.4 Solving Multi-Step Inequalities:

Warm-up/Starting Options	Explorations p. T-73
Practice and Apply	p. 77-78 #1-16, 32, 41-43
Resources	Online Dynamic Classroom has all resources available. Review: Practice A and Practice B, Puzzle Time, Student Journal, and Skills Review Handbook Advanced: Enrichment and Extension, Cumulative Review
Section 2.5 Solving Compound Inequalities:	
Warm-up/Starting Options	Explorations p. T-81
Practice and Apply	p. 85-86 #1-11, 13-18, 25-28, 35-39 (odd only)
Resources	Online Dynamic Classroom has all resources available. Review: Practice A and Practice B, Puzzle Time, Student Journal, and Skills Review Handbook Advanced: Enrichment and Extension, Cumulative Review
Section 2.6 Solving Absolute Value Inequalities:	
Warm-up/Starting Options	Explorations p. T-87
Practice and Apply	p. 91-92 #1-17, 38, 41-46 (odd only)
Resources	Online Dynamic Classroom has all resources available. Review: Practice A and Practice B, Puzzle Time, Student Journal, and Skills Review Handbook Advanced: Enrichment and Extension, Cumulative Review

ELL Accommodations/Modifications:

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Formative Assessments:

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Performance Assessments:

Performance Tasks, Projects, Display of Student Work

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ENGAGING STUDENTS ● FOSTERING ACHIEVEMENT ● CULTIVATING 21ST CENTURY GLOBAL SKILLS

Course Name: Algebra 1 ELL

Course Number: 031300

PART I: UNIT RATIONALE

WHY ARE STUDENTS LEARNING THIS CONTENT AND THESE SKILLS?

Course Title: Algebra 1 / Graphing Linear Functions	Unit Summary: In this unit, students will expand on their conceptual understanding of functions. Their understanding may be of a “function machine” where there is an input, a function is performed, and an output results. There is a pairing of the input and output, and each input is associated with exactly one output. This chapter extends this introductory understanding of functions and presents the notation of functions. Consistent use of the notation and language of functions will help students become more confident. The early part of the chapter focuses on function notation, representing functions, discrete and continuous functions, and evaluating functions. Students may be resistant to using function notation, preferring the simpler “ $y =$ ” notation. It is hard for students to appreciate what the broader notation enables us to do because they have not learned enough at this stage. When two equations are graphed on the same axes, we can clearly refer to f and g , versus saying “the first $y =$ ” and “the second $y =$ ”. We compose functions and have functions with multiple inputs, two examples where function notation is useful. The middle portion of the chapter introduces two forms of linear equations – standard and slope intercept. The last lesson of the chapter looks absolute value functions.
Grade Level: 9-10	

Essential Question(s): • What is a function? • How can you determine whether a function is linear or nonlinear? • How can you use function notation to represent a function? • How can you describe the graph of the equation $Ax + By = C$? • How can you describe the graph of the equation $y = mx + b$? • How do the values of a, h, and k affect the graph of the absolute value function?	Enduring Understanding(s): Students will be able to: • Determine whether relations are functions. • Find the domain and range of a function. • Identify the independent and dependent variables of a function. • Identify linear functions using graphs, tables, and equations. • Graph linear functions using discrete and continuous data. • Write real-life problems to fit data. • Use function notation to evaluate and interpret functions. • Use function notation to solve and graph functions. • Graph equations of horizontal and vertical lines. • Graph linear equations in standard form using intercepts. • Find the slope of a line. • Use the slope-intercept form of a linear equation. • Translate graphs of absolute value functions. • Stretch, shrink, and reflect graphs of absolute value functions.
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PART II: INSTRUCTIONAL STRATEGIES AND RESOURCES

DESCRIBE THE LEARNING TARGETS.

After each target, identify the New Jersey Student Learning Standards that are applicable

<u>Learning Target</u> 1. Use function notation. [Standard] - Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If f is a function and x is an element of its domain, then $f(x)$ denotes the output of f corresponding to the input x. The graph of f is the graph of the equation $y = f(x)$. [Standard] - Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axis with labels and scales. [Standard] - Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line). [Standard] - Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. [Standard] - Recognize situations in which one quantity changes at a constant rate per unit interval relative to another. [Standard] - Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context. [Standard] - Graph linear and quadratic functions and show intercepts, maxima, and minima. [Standard] - Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).	<u>NJSLS:</u> 1. <i>NJSLS-F-IF.A.1, NJSLS-A-CED.A.2, NJSLS-A-REI.D.10, NJSLS-F-IF.B.5, NJSLS-F-LE.A.1b, NJSLS-F-IF.A.2 NJSLS-F-IF.C.7a, NJSLS-F-IF-C.9</i>
2. Graph linear equations. [Standard] - Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales. [Standard] - Graph linear and quadratic functions and show intercepts, maxima, and minima. [Standard] - For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. [Standard] - Interpret the parameters in a linear or exponential function in terms of a context.	2. <i>NJSLS-A-CED.A.2, NJSLS-F-IF.C.7a, NJSLS-F-IF.B.4, NJSLS-F-LE.B.5</i>
3. Graph absolute value functions. [Standard] - Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales. [Standard] - Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).	3. <i>NJSLS-A-CED.A.2, NJSLS-A-REI.D.10, NJSLS-F-IF.C.7b</i>

[Standard] - Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions.	
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Key Vocabulary necessary for ELL students for this chapter

Function Domain Range Exponential Square root Cube root Independent variable Dependent variable Relation Intercepts Slope

Inter-Disciplinary Connections:

Real-World problem solving examples:

Bottled Juice (p. 107) Complete part “a” of problem together as a class before requiring part “b” to be completed individually.

Taxi Fare (p. 109) Complete part “a” of problem together as a class before requiring part “b” to be completed individually.

Vending Machines (p. 109) Before completing part “a” as a class, have students independently complete parts “b” and “c.”

Calories (p. 115) Review “discrete” versus “concrete” types of domains before completing this problem.

Book Cost (p. 118) Review “discrete” versus “concrete” types of domains before completing this problem.

Dog Grooming (p. 119) Review definition of “linear function” before students complete this problem. Have students check part “a” before moving onto parts “b” and “c.”

Car Rental (p. 119) Have students check part “a” before moving onto parts “b” and “c.”

Helicopter Rides (p. 124) Scan the graph with students. Graph second flight as a class. Direct students to make an input-output table before students start to solve problem.

Restaurant Customers (p. 125) Model proper wording of “a” and “b” and have students use model wording to write out for “c” and “d.”

Internet Use (p. 125) Model proper wording of “a” and “b” and have students use model wording to write out for “c” and “d.”

Orchestra Tickets (p.125) Complete part “a” of problem together as a class before requiring part “b” to be completed individually.

Laptop Batteries (p. 126) Solve laptop battery part of problem as a class and to serve as a model for tablet battery part of question.

Awards Banquet (p. 132) Specifically define intercepts for this problem. Create visuals of this problem as it is absent in textbook.

Buying Shirts (p. 133) Complete part “a” of problem together as a class before requiring part “b” to be completed individually.

Class Trip (p. 134) Specifically define intercepts for this problem. Complete part “a” of problem together as a class before requiring part “b” to be completed individually.”

Submarine Ascent (p. 140) Define “ascend” and “elevation.” Review slope intercept form.

Snow Depth (p. 142) Highlight formula provided in image. Require only part “a” of problem.

Truck Rental (p. 142) Have students check part “a” before moving onto part “b.”

Selling Shoes (p. 161) Provide graph for students to graph function.

Computer Games (p. 162) Define “right angle” and “coordinates.” Have students check part “a” before moving onto part “b.”

Inter-Disciplinary problem solving examples:

Physics (p. 110) Have students check part “a” before moving onto parts “b,” “c,” and “d.”

Rock Climbing (p. 119) Review “discrete” versus “concrete” types of domains before completing this problem.

Speed of Light (p. 125) Provide variable for time given.

Construction (p. 126) Create a chart for the competitor to assist students in visualizing problem presented.

Football Game (p. 133) Simplify language of problem by using written and numeral numbers.

Basketball (p. 134) Highlight what x and y represent. Do not require part “c.”

Farming (p. 142) Provide graph for students.

Students will engage with the following text, resources and tools:

Text:

- Algebra 1, A Common Core Curriculum – Big Ideas Math, *Big Ideas Learning LLC., 2019*

Online Resources incorporated through the year, include but not limited to:

- BigIdeasMath.com – publisher on-line assignments, resources and text
- Desmos – online graphing tool
- ALEKS – web-based artificially intelligent software
- IXL – web-based software
- G Suite for education – Google Classroom, Docs, Drive, Mail, etc...

Calculators:

- TI – 84 Plus graphing calculator

The following 21st century skills and the 8 mathematical practices are embedded throughout the course and are evident in daily lessons, assignments, activities, assessments and projects:

21st Century skills: ● Critical thinking ● Creativity ● Collaboration ● Communication ● Information literacy ● Technology literacy ● Media literacy ● Flexibility ● Leadership ● Initiative ● Productivity ● Social skills	Mathematical Practices: ● Make sense of problems and persevere in solving them ● Reason abstractly and quantitatively ● Construct viable arguments and critique the reasoning of others ● Model with mathematics ● Use appropriate tools strategically ● Attend to precision ● Look for and make use of structure ● Look for and express regularity in repeated reasoning
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Students will write:

Students will define and compare/contrast given terms. Students will express their knowledge and skills in their own words, organize their thinking about the content, and write explanations to solve problems. Students will also relate real world situations using algebra terminology.

PART III: TRANSFER OF KNOWLEDGE AND SKILLS

DESCRIBE THE LEARNING EXPERIENCE.

How will students uncover content and build skills?

Opportunities for developing students' understanding in this chapter include: investigating algebra activities, problem solving workshops, modeling examples, using real-life application or other hands on activities such as projects. Technology such as animated algebra, Smart Board, and graphing calculators will also be explored through the learning experience. Other interests could include, but is not limited to alternative lesson openers, using note-taking strategies, math and history applications, and interdisciplinary applications.

Suggested warm-up activities, instructional strategies/activities, and assignments:

Section 3.1 Functions:

Warm-up/Starting Options	Explorations p. T-103
Practice and Apply	p. 108-110 #1-17, 19, 20, 44-51 (odd numbers only)
Resources	Online Dynamic Classroom has all resources available. Review: Practice A and Practice B, Puzzle Time, Student Journal, and Skills Review Handbook Advanced: Enrichment and Extension, Cumulative Review

Section 3.2 Linear Functions:

Warm-up/Starting Options	Explorations p. T-111
Practice and Apply	p. 117-120 #1-15, 17-25, 27, 28, 55-61 (odd numbers only)
Resources	Online Dynamic Classroom has all resources available. Review: Practice A and Practice B, Puzzle Time, Student Journal, and Skills Review Handbook Advanced: Enrichment and Extension, Cumulative Review

Section 3.3 Function Notation:

Warm-up/Starting Options	Explorations p. T-121
Practice and Apply	p. 125-126 #1-10, 13-16, 21, 22, 37-42 (odd numbers only)
Resources	Online Dynamic Classroom has all resources available. Review: Practice 33 odd A and Practice B, Puzzle Time, Student Journal, and Skills Review Handbook Advanced: Enrichment and Extension, Cumulative Review

	Real Life STEM Video: Speed of Light
Section 3.4 Graphing Linear Equations in Standard Form:	
Warm-up/Starting Options	Explorations p. T-129
Practice and Apply	p. 133-134 #1-20, 25, 26, 29-32, 39-42 (odd numbers only)
Resources	Online Dynamic Classroom has all resources available. Review: Practice A and Practice B, Puzzle Time, Student Journal, and Skills Review Handbook Advanced: Enrichment and Extension, Cumulative Review
Section 3.5 Graphing Linear Equations in Slope-Intercept Form:	
Warm-up/Starting Options	Explorations p. T-135
Practice and Apply	p. 141-144 #1-22, 25-28, 54-60 (odd numbers only)
Resources	Online Dynamic Classroom has all resources available. Review: Practice A and Practice B, Puzzle Time, Student Journal, and Skills Review Handbook Advanced: Enrichment and Extension, Cumulative Review
Section 3.7 Graphing Absolute Value Functions:	
Warm-up/Starting Options	Explorations p. T-155
Practice and Apply	p. 160-162 #1-15, 23-26, 33-38, 45, 64-70 (odd numbers only)
Resources	Online Dynamic Classroom has all resources available. Review: Practice A and Practice B, Puzzle Time, Student Journal, and Skills Review Handbook Advanced: Enrichment and Extension, Cumulative Review

ELL Accommodations/Modifications:

Allow editing and revision before grading. Do not grade based on language usage. Explicitly teach language objectives. Simplify language used in instruction. Provide additional instruction including reviews, drills and opportunities for re-teaching. Teach in small groups when possible. Provide visual aids to enhance key concepts. Use Graphic Organizers. Assist students to underline key words or important facts in text. Provide prompts, photocopies of notes or outlines, or highlighted texts and materials. Provide frequent checks for comprehension. Provide simplified/additional instructions. Provide opportunity for student to provide oral responses to be

recorded by teacher or paraprofessional. Accept correct answers on test or worksheets in any written form such as lists, phrases, or using inventive spelling.

PART IV: EVIDENCE OF LEARNING

IDENTIFY THE METHODS BY WHICH STUDENTS WILL DEMONSTRATE THEIR UNDERSTANDING OF CONTENT AND THEIR ABILITY TO APPLY SKILLS.

IDENTIFY BLOOM'S LEVELS.



Formative Assessments:

The effectiveness of the instructional program will be based on numerous activities and strategies including the following: teacher observations, students collaborating with peers, questioning strategies, student record-keeping, quizzes, exit/admit assignments, peer/self-assessments, learning/response logs, discussions and practice presentations.

ELL Accommodations/Modifications for Formative Assessments:

Provide frequent checks for comprehension. Simplify the language and format of the assessment to match the language utilized during instruction. Provide opportunity for student to provide oral responses to be recorded by teacher or paraprofessional. Accept correct answers on test or worksheets in any written form such as lists, phrases, or using inventive spelling.

Summative Assessments:

The following assessments will be used to evaluate student learning, skill acquisition and academic achievement of the Standards of Mathematical Practice and the New Jersey Learning Standards for Mathematics listed under each chapter in the Geometry curriculum/syllabus at the conclusion of an instructional time period.

- Diagnostic Pre-Test
- Chapter Tests
- Periodic Benchmark Tests
- End-Of –Course Assessment
- Standardized Tests

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Allow editing and revision before grading. Do not grade based on language usage. Provide simplified/additional instructions. Provide a word bank. Provide an opportunity for the student to take the test/re-test individually with a teacher or paraprofessional. Allow for the test to be read aloud. Simplify the language and format of the assessment to match the language utilized during instruction. Allow for extended time to complete the assessment. Provide opportunity for student to provide oral responses to be recorded by teacher or paraprofessional. Accept correct answers on test or worksheets in any written form such as lists, phrases, or using inventive spelling.

Performance Assessments:

Performance Tasks, Projects, Display of Student Work

ELL Accommodations/Modifications for Performance Assessments:

Allow editing and revision before grading. Do not grade based on language usage. Provide simplified/additional instructions. Provide examples of projects. Design projects and assessment for student that require reduced sentence or paragraph composition.

Black Horse Pike Regional School District Curriculum Template

ENGAGING STUDENTS ● FOSTERING ACHIEVEMENT ● CULTIVATING 21ST CENTURY GLOBAL SKILLS

Course Name: Algebra 1 ELL

Course Number: 031300

PART I: UNIT RATIONALE

WHY ARE STUDENTS LEARNING THIS CONTENT AND THESE SKILLS?

Course Title: Algebra 1 / Writing Linear Functions	Unit Summary: In this unit, students begin writing linear equations in slope-intercept form, point-slope form, and standard form. These forms are extended in the next lesson to include the cases of parallel and perpendicular lines.
Grade Level: 9-10	
Essential Question(s): - Given the graph of a linear function, how can you write an equation of the line? - How can you write the 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?	Enduring Understanding(s): Students will be able to: - Write equations in slope-intercept form. - Use linear equations to solve real-life problems. - Write an equation of a line given its slope and a point on the line. - Write an equation of a line given two points on the line. - Use linear equations to solve real-life problems. - Identify and write equations of parallel lines. - Identify and write equations of perpendicular lines. - Use parallel and perpendicular lines in real-life problems.

PART II: INSTRUCTIONAL STRATEGIES AND RESOURCES

DESCRIBE THE LEARNING TARGETS.

After each target, identify the New Jersey Student Learning Standards that are applicable

<u>Learning Target</u> 1. Write linear equations. [Standard] - Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales. [Standard] - Determine an explicit expression, a recursive process, or steps for calculation from a context. [Standard] - Recognize situations in which one quantity changes at a constant rate per unit interval relative to another. [Standard] - Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table).	<u>NJSLS:</u> 1. <i>NJSLS-A-CED.A.2, NJSLS-F-BF.A.1a, NJSLS-F-LE.A.1b, NJSLS-F-LE.A.2</i>
2. Use linear equations to represent real-life situations. [Standard] - Determine an explicit expression, a recursive process, or steps for calculation from a context. [Standard] - Recognize situations in which one quantity changes at a constant rate per unit interval relative to another. [Standard] - Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table).	2. <i>NJSLS-F-BF.A.1a, NJSLS-F-LE.A.1b, NJSLS-F-LE.A.2</i>
3. Write the equations of lines parallel or perpendicular to a given line. [Standard] - Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales. [Standard] - Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table).	3. <i>NJSLS-A-CED.A.2, NJSLS-F-LE.A.2</i>

Key Vocabulary necessary for ELL students for this chapter

slope-intercept form function rate point slope form reciprocal perpendicular lines parallel lines
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Inter-Disciplinary Connections:

Real-World problem solving examples:

World Records (p. 180) Require only part “a” of problem.”

Music Studio (p. 180) Have students check part “a” before moving onto part “b.”

Box Office Revenue (p. 180) Define “revenue” for students.”

Student Council (p. 184) Define “rate of change” for students. Clarify what the problem is asking. Provide step by step directions of how to determine rate of change.

Internet Service Fees (p. 184) Define installation fee and place it in proper section of linear equation.

Band Advertisement (p. 186) Define “sticker.” Have students check part “a” before moving onto part “b.”

Beach House Rental (p. 186) Provide directions of how to complete part “b.”

Weekly Allowance (p. 186) Set up equation for students to solve “most” so that example can be used to solve “least.”

Bike Paths (p. 192) Clarify and label where railroad tracks are on graph.

Registration Fees (p. 192) Complete part “a” as a class so that students can complete part “b” following the model from part “a.”

Inter-Disciplinary problem solving examples:

Renewable Energy (p. 178) Simplify parts of question and identify variables for linear model.

Aviation and Flight Paths (p. 190) Define negative reciprocal and point out to students that the line is perpendicular.

Construction (p. 192) Highlight that the line is perpendicular.

Hockey (p. 192) Provide first step for this question to give students a starting point.

Students will engage with the following text, resources and tools:

Text:

- Algebra 1, A Common Core Curriculum – Big Ideas Math, *Big Ideas Learning LLC., 2019*

Online Resources incorporated through the year, include but not limited to:

- BigIdeasMath.com – publisher on-line assignments, resources and text
- Desmos – online graphing tool
- ALEKS – web-based artificially intelligent software
- IXL – web-based software
- G Suite for education – Google Classroom, Docs, Drive, Mail, etc...

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- TI – 84 Plus graphing calculator

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21st Century skills: ● Critical thinking ● Creativity ● Collaboration ● Communication ● Information literacy ● Technology literacy ● Media literacy ● Flexibility ● Leadership ● Initiative ● Productivity ● Social skills	Mathematical Practices: ● Make sense of problems and persevere in solving them ● Reason abstractly and quantitatively ● Construct viable arguments and critique the reasoning of others ● Model with mathematics ● Use appropriate tools strategically ● Attend to precision ● Look for and make use of structure ● Look for and express regularity in repeated reasoning
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How will students uncover content and build skills?

Opportunities for developing students' understanding in this chapter include: investigating algebra activities, problem solving workshops, modeling examples, using real-life application or other hands on activities such as projects. Technology such as animated algebra, Smart Board, and graphing calculators will also be explored through the learning experience. Other interests could include, but is not limited to alternative lesson openers, using note-taking strategies, math and history applications, and interdisciplinary applications.

Suggested warm-up activities, instructional strategies/activities, and assignments:

Section 4.1 Writing Equations in Slope-Intercept Form:

Warm-up/Starting Options	Explorations p. T-175
Practice and Apply	p. 179-180 #1-18, 27, 28, 38-45 (odd numbers only)
Resources	Online Dynamic Classroom has all resources available. Review: Practice A and Practice B, Puzzle Time, Student Journal, and Skills Review Handbook Advanced: Enrichment and Extension, Cumulative Review Real Life STEM Video: Future Wind Power

Section 4.2 Writing Equations in Point-Slope Form:

Warm-up/Starting Options	Explorations p. T-181
Practice and Apply	p. 185-186 #1-8, 11-20, 41-44 (odd numbers only)
Resources	Online Dynamic Classroom has all resources available. Review: Practice A and Practice B, Puzzle Time, Student Journal, and Skills Review Handbook Advanced: Enrichment and Extension, Cumulative Review

Section 4.3 Writing Equations of Parallel and Perpendicular Lines:

Warm-up/Starting Options	Explorations p. T-187
Practice and Apply	p. 191-192 #1-6, 9, 10, 13-16, 19, 20, 25, 26, 37, 38 (odd numbers only)
Resources	Online Dynamic Classroom has all resources available. Review: Practice 33 odd A and Practice B, Puzzle Time, Student Journal, and Skills Review Handbook Advanced: Enrichment and Extension, Cumulative Review

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PART IV: EVIDENCE OF LEARNING

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IDENTIFY BLOOM'S LEVELS.



Formative Assessments:

The effectiveness of the instructional program will be based on numerous activities and strategies including the following: teacher observations, students collaborating with peers, questioning strategies, student record-keeping, quizzes, exit/admit assignments, peer/self-assessments, learning/response logs, discussions and practice presentations.

ELL Accommodations/Modifications for Formative Assessments:

Provide frequent checks for comprehension. Simplify the language and format of the assessment to match the language utilized during instruction. Provide opportunity for student to provide oral responses to be recorded by teacher or paraprofessional. Accept correct answers on test or worksheets in any written form such as lists, phrases, or using inventive spelling.

Summative Assessments:

The following assessments will be used to evaluate student learning, skill acquisition and academic achievement of the Standards of Mathematical Practice and the New Jersey Learning Standards for Mathematics listed under each chapter in the Geometry curriculum/syllabus at the conclusion of an instructional time period.

- Diagnostic Pre-Test
- Chapter Tests
- Periodic Benchmark Tests
- End-Of –Course Assessment
- Standardized Tests

ELL Accommodations/Modifications for Summative Assessments:

Allow editing and revision before grading. Do not grade based on language usage. Provide simplified/additional instructions. Provide a word bank. Provide an opportunity for the student to take the test/re-test individually with a teacher or paraprofessional. Allow for the test to be read aloud. Simplify the language and format of the assessment to match the language utilized during instruction. Allow for extended time to complete the assessment. Provide opportunity for student to provide oral responses to be recorded by teacher or paraprofessional. Accept correct answers on test or worksheets in any written form such as lists, phrases, or using inventive spelling.

Performance Assessments:

Performance Tasks, Projects, Display of Student Work

ELL Accommodations/Modifications for Performance Assessments:

Allow editing and revision before grading. Do not grade based on language usage. Provide simplified/additional instructions. Provide examples of projects. Design projects and assessment for student that require reduced sentence or paragraph composition.

Black Horse Pike Regional School District Curriculum Template

ENGAGING STUDENTS ● FOSTERING ACHIEVEMENT ● CULTIVATING 21ST CENTURY GLOBAL SKILLS

Course Name: Algebra 1 ELL

Course Number: 031300

PART I: UNIT RATIONALE

WHY ARE STUDENTS LEARNING THIS CONTENT AND THESE SKILLS?

Course Title: Algebra 1 / Solving Systems of Linear Equations	Unit Summary: In this unit, students will study the three common techniques for solving a system of equations: graphing, substitution, and elimination. These techniques are presented in the first three sections of this chapter. Students are introduced to the definition of a linear system, and they learn to check their solutions. The fourth section looks at special linear systems, where there is no solution because the lines are parallel or there are infinitely many solutions because the lines coincide. The last lessons combine prior skills to allow students to graph systems of linear inequalities.
Grade Level: 9-10	
Essential Question(s): ● How can you solve a system of linear equations? ● 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 graph a linear inequality in two variables? ● How can you graph a system of linear inequalities?	Enduring Understanding(s): Students will be able to: ● Check solutions of systems of linear equations. ● Solve systems of linear equations by graphing. ● Use systems of linear equations to solve real-life problems. ● Solve systems of linear equations by substitution. ● Solve systems of linear equations by elimination. ● Determine the number of solutions of linear systems. ● Use linear systems to solve real-life problems. ● Check solutions of linear inequalities. ● Graph linear inequalities in two variables. ● Use linear inequalities to solve real-life problems. ● Check solutions of systems of linear inequalities. ● Graph systems of linear inequalities. ● Write systems of linear inequalities. ● Use systems of linear inequalities to solve real-life problems.

PART II: INSTRUCTIONAL STRATEGIES AND RESOURCES

DESCRIBE THE LEARNING TARGETS.

After each target, identify the New Jersey Student Learning Standards that are applicable

<u>Learning Target</u>	<u>NJSLS:</u>
1. Solve systems of linear equations. [Standard] - Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context. [Standard] - Prove that, given a system of two equations in two variables, replacing one equation by the sum of that equation and a multiple of the other produces a system with the same solutions. [Standard] - Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.	1. NJSLS-A-CED.A.3, NJSLS-A-REI.C.5, NJSLS-A-REI.C.6
2. Determine the number of solutions to a system of linear equations. [Standard] - Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context. [Standard] - Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.	2. NJSLS-A-CED.A.3, NJSLS-A-REI.C.6
3. Graph systems of linear inequalities. [Standard] - Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context. [Standard] - Graph the solutions to a linear inequality in two variables as a half plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes.	3. NJSLS-A-CED.A.3, NJSLS-A-REI.D.12

Key Vocabulary necessary for ELL students for this chapter

Ordered pair System of linear equations Solution of a system of linear equation Linear inequality Variable Graph of a linear inequality Half planes

Inter-Disciplinary Connections:

Real-World problem solving examples:

Exercise Machines (p. 240) Set up the system of linear equation for students.

Selling Candles (p. 240) Set up the system of linear equation for students.

Account Balances (p. 240) Provide graph for students to graph linear equation.

Purchasing Binders (p. 240) Require only part “a” of problem.

Hiking (p. 240) Provide graph for system of linear equation to be mapped on.

Drama Production (p. 244) Set up problem for students by taking words and showing what variables they represent.

Farming (p. 245) Set up problem for students by taking words and showing what variables they represent.

Tubing Trips (p. 245) Highlight prices provided and set up variables for different prices for students.

Radio Stations (p. 246) Rewrite information from problem in bullet form to assist students in setting up linear equation.

Delivery Vans (p. 250) Set up problem for students by taking words and showing what variables they represent.

Oil Change (p. 251) Highlight prices provided and set up variables for fee and total cost for students.

Downloading Music (p. 251) Rewrite information from problem in bullet form to assist students in setting up linear equation. Highlight that there are two questions, and thus, two answers that need to be provided.

Current Speed (p. 252) Utilize an image for students to visualize downstream and a motorboat.

Trail Mix (p. 258) Rewrite information from problem in bullet form to assist students in setting up linear equation.

Canoe Race (p. 258) Rewrite information from problem in bullet form to assist students in setting up linear equation.

Train Travel (p. 258) Utilize a map to show what “leg of the trip” means.

Ice Skating (p. 258) Set up problem for students by taking words and showing what variables they represent.

Fruit Salad (p. 270) Set up problem for students by taking words and showing what variables they represent.

Arcade Games (p. 272) Review “at most” and then set up problem for students by taking words and showing what variables they represent.

Drama Production (p. 272) Provide graph for system of linear equation to be mapped on.

Leisure Time (p. 277) Set up problem for students by taking words and showing what variables they represent.

Making Muffins (p. 279) Only require parts “a” and “b.”

Working Hours (p. 279) Rewrite information from problem in bullet form to assist students in setting up linear equation.

Inter-Disciplinary problem solving examples:

Construction (p. 238) Set up problem for students by taking words and showing what variables they represent.

Financial Planning (p. 246) Provide image of “stock” to make problem more applicable and relevant for student.

Track and Field (p. 258) Only require part “a.”

Carpentry (p. 271) Clarify “board” and the corresponding sizes that the problem discusses.

Marine Biology (p. 279) Define “gaming” to make problem more applicable and relevant for student.

Art Projects (p. 280) Only require parts “a” and “c.”

Students will engage with the following text, resources and tools:

Text:

- Algebra 1, A Common Core Curriculum – Big Ideas Math, *Big Ideas Learning LLC., 2019*

Online Resources incorporated through the year, include but not limited to:

- BigIdeasMath.com – publisher on-line assignments, resources and text
- Desmos – online graphing tool
- ALEKS – web-based artificially intelligent software
- IXL – web-based software
- G Suite for education – Google Classroom, Docs, Drive, Mail, etc...

Calculators:

- TI – 84 Plus graphing calculator

The following 21st century skills and the 8 mathematical practices are embedded throughout the course and are evident in daily lessons, assignments, activities, assessments and projects:

21st Century skills:

- Critical thinking
- Creativity
- Collaboration
- Communication
- Information literacy
- Technology literacy
- Media literacy
- Flexibility
- Leadership
- Initiative
- Productivity
- Social skills

Mathematical Practices:

- Make sense of problems and persevere in solving them
- Reason abstractly and quantitatively
- Construct viable arguments and critique the reasoning of others
- Model with mathematics
- Use appropriate tools strategically
- Attend to precision
- Look for and make use of structure
- Look for and express regularity in repeated reasoning

Students will write:

Students will define and compare/contrast given terms. Students will express their knowledge and skills in their own words, organize their thinking about the content, and write explanations to solve problems. Students will also relate real world situations using algebra terminology.

PART III: TRANSFER OF KNOWLEDGE AND SKILLS

DESCRIBE THE LEARNING EXPERIENCE.

How will students uncover content and build skills?

Opportunities for developing students' understanding in this chapter include: investigating algebra activities, problem solving workshops, modeling examples, using real-life application or other hands on activities such as projects. Technology such as animated algebra, Smart Board, and graphing calculators will also be explored through the learning experience. Other interests could include, but is not limited to alternative lesson openers, using note-taking strategies, math and history applications, and interdisciplinary applications.

Suggested warm-up activities, instructional strategies/activities, and assignments:

Section 5.1 Solving Systems of Linear Equations by Graphing:

Warm-up/Starting Options	Explorations p. T-235
Practice and Apply	p. 239-240 #1-16, 34-36 (odd numbers only)
Resources	Online Dynamic Classroom has all resources available. Review: Practice A and Practice B, Puzzle Time, Student Journal, and Skills Review Handbook Advanced: Enrichment and Extension, Cumulative Review

Section 5.2 Solving Systems of Linear Equations by Substitution:

Warm-up/Starting Options	Explorations p. T-241
Practice and Apply	p. 245-246 #1-12, 17, 18, 36-41 (odd numbers only)
Resources	Online Dynamic Classroom has all resources available. Review: Practice A and Practice B, Puzzle Time, Student Journal, and Skills Review Handbook Advanced: Enrichment and Extension, Cumulative Review

Section 5.3 Solving Systems of Linear Equations by Elimination:

Warm-up/Starting Options	Explorations p. T-247
Practice and Apply	p. 251-252 #1-9, 11-14, 19, 36-42 (odd numbers only)
Resources	Online Dynamic Classroom has all resources available. Review: Practice 33 odd A and Practice B, Puzzle Time, Student Journal, and Skills Review Handbook Advanced: Enrichment and Extension, Cumulative Review

Section 5.4 Solving Special Systems of Linear Equations:

Warm-up/Starting Options	Explorations p. T-253
Practice and Apply	p. 257-258 #1-14, 23, 24, 33-36 (odd numbers only)
Resources	Online Dynamic Classroom has all resources available. Review: Practice A and Practice B, Puzzle Time, Student Journal, and Skills Review Handbook Advanced: Enrichment and Extension, Cumulative Review Real Life STEM Video: Future Wind Power

Section 5.6 Graphing Linear Inequalities in Two Variables:

Warm-up/Starting Options	Explorations p. T-267
Practice and Apply	p. 271-272 #1-17, 19-26, 31, 32, 46-48 (odd numbers only)
Resources	Online Dynamic Classroom has all resources available. Review: Practice A and Practice B, Puzzle Time, Student Journal, and Skills Review Handbook Advanced: Enrichment and Extension, Cumulative Review

Section 5.7 Systems of Linear Inequalities:

Warm-up/Starting Options	Explorations p. T-273
Practice and Apply	p. 278-280 #1-15, 27, 28, 49-55 (odd numbers only)
Resources	Online Dynamic Classroom has all resources available. Review: Practice 33 odd A and Practice B, Puzzle Time, Student Journal, and Skills Review Handbook Advanced: Enrichment and Extension, Cumulative Review Real Life STEM Videos: Setting Fisher Limits

ELL Accommodations/Modifications:

Allow editing and revision before grading. Do not grade based on language usage. Explicitly teach language objectives. Simplify language used in instruction. Provide additional instruction including reviews, drills and opportunities for re-teaching. Teach in small groups when possible. Provide visual aids to enhance key concepts. Use Graphic Organizers. Assist students to underline key words or important facts in text. Provide prompts, photocopies of notes or outlines, or highlighted texts and materials. Provide frequent checks for comprehension. Provide simplified/additional instructions. Provide opportunity for student to provide oral responses to be recorded by teacher or paraprofessional. Accept correct answers on test or worksheets in any written form such as lists, phrases, or using inventive spelling.

PART IV: EVIDENCE OF LEARNING

IDENTIFY THE METHODS BY WHICH STUDENTS WILL DEMONSTRATE THEIR UNDERSTANDING OF CONTENT AND THEIR ABILITY TO APPLY SKILLS.

IDENTIFY BLOOM'S LEVELS.



Formative Assessments:

The effectiveness of the instructional program will be based on numerous activities and strategies including the following: teacher observations, students collaborating with peers, questioning strategies, student record-keeping, quizzes, exit/admit assignments, peer/self-assessments, learning/response logs, discussions and practice presentations.

ELL Accommodations/Modifications for Formative Assessments:

Provide frequent checks for comprehension. Simplify the language and format of the assessment to match the language utilized during instruction. Provide opportunity for student to provide oral responses to be recorded by teacher or paraprofessional. Accept correct answers on test or worksheets in any written form such as lists, phrases, or using inventive spelling.

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The following assessments will be used to evaluate student learning, skill acquisition and academic achievement of the Standards of Mathematical Practice and the New Jersey Learning Standards for Mathematics listed under each chapter in the Geometry curriculum/syllabus at the conclusion of an instructional time period.

- Diagnostic Pre-Test
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Performance Tasks, Projects, Display of Student Work

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Black Horse Pike Regional School District Curriculum Template

ENGAGING STUDENTS ● FOSTERING ACHIEVEMENT ● CULTIVATING 21ST CENTURY GLOBAL SKILLS

Course Name: Algebra 1

Course Number: 031300

PART I: UNIT RATIONALE

WHY ARE STUDENTS LEARNING THIS CONTENT AND THESE SKILLS?

Course Title: Algebra 1 / Exponential Functions and Sequences	Unit Summary: In this unit, students will begin working with nonlinear functions. This chapter introduces students to exponential functions. Students will revisit exponential functions in Algebra 2. The properties of exponents presented in the first lesson should be a review for students. Many of the problems involve numeric expressions, although there are algebraic expressions as well. The next lessons are about exponential functions and the attributes of exponential growth and decay functions.
Grade Level: 9-10	
Essential Question(s): ● How can you write general rules involving properties of exponents? ● What are some of the characteristics of the graph of an exponential function? ● What are some of the characteristics of exponential growth and exponential decay functions?	Enduring Understanding(s): Students will be able to: ● Use zero and negative exponents. ● Use the properties of exponents. ● Solve real-life problems involving exponents. ● Identify and evaluate exponential functions. ● Graph exponential functions. ● Solve real-life problems involving exponential functions. ● Use and identify exponential growth and decay functions. ● Interpret and rewrite exponential growth and decay functions. ● Solve real-life problems involving exponential growth and decay.

PART II: INSTRUCTIONAL STRATEGIES AND RESOURCES

DESCRIBE THE LEARNING TARGETS.

After each target, identify the New Jersey Student Learning Standards that are applicable

<u>Learning Target</u> 1. Use properties of exponents. [Standard] - Rewrite expressions involving radicals and rational exponents using the properties of exponents.	<u>NJSLS:</u> 1. <i>NJSLS-N-RN.A.2</i>
2. Graph exponential functions. [Standard] - Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales. [Standard] - For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. [Standard] - Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude. [Standard] - Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). [Standard] - Recognize situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another.	2. <i>NJSLS-A-CED.A.2, NJSLS-F-IF.B.4, NJSLS-F-IF.C.7e, NJSLS-F-IF.C.9, NJSLS-F-LE.A.1c</i>
3. Solve real-life problems using exponential growth and decay. [Standard] - Recognize situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another. [Standard] - Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table).	3. <i>NJSLS-F-LE.A.1c, NJSLS-F-LE.A.2</i>

Key Vocabulary necessary for ELL students for this chapter

Exponents Power Base Scientific notation Radical Index of a radical Square root Exponential function Parent function Exponential growth Exponential growth function Exponential decay Exponential decay function
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Compound interest
Exponential equation
Geometric sequence
Common ratio
Explicit rule
Recursive rule

Inter-Disciplinary Connections:

Real-World problem solving examples:

Finding Volume (p. 295) Provide volume for a cylinder formula.

Computer Chips (p. 296) Provide area for a rectangle formula.

Harvesting Vegetables (p. 297) Provide images of harvesting potatoes to make problem more relevant to students.

Coyote Population (p. 311) Define “triples” for students. Review definitions of “domain” and “range” if necessary.

Art Gallery (p. 312) Provide image of art gallery to make problem more relevant to students.

Sales Report (p. 312) Provide image of grill to make problem more relevant to students. Rewrite information from problem in bullet form to assist students in setting up equation.

Bald Eagle Populations (p. 313) Provide image of bald eagle to make problem more relevant to students. Define “pattern” for students.

Music Festival Attendance (p. 314) Set up problem for students by taking words and showing what variables they represent.

Website Membership (p. 314) Rewrite information from problem in bullet form to assist students in setting up linear equation. Highlight that there are two questions, and thus, two answers that need to be provided.

Car Value (p. 318) Point to students that the question is asking for “monthly” value. Check that students have correct rate of decay before permitting students to move on.

City Population (p. 319) Have students check part “a” before moving onto part “b.”

Website Visitors (p. 320) Have students check part “a” before moving onto part “b.”

Tree Growth (p. 321) Define “cross sectional” and “coordinate plane” for students.

Medication Dosage (p. 321) Define “ibuprofen” and “bloodstream” for students.

Store Sales (p. 322) Rewrite information from problem in table form to assist students in setting up equation.

Inter-Disciplinary problem solving examples:

Marine Biology (p. 295) Define “photons” and “emit” for students.

Using Microscopes (p. 296) Remind students of definition of “power of product property.”

Bacterial Populations (p. 309) Highlight to students that there are two parts to this problem, and thus, two answers are required.

Stock Prices (p. 312) Provide image of “stock” to make problem more applicable and relevant for student.

Financial Planning (p. 317) Define “annual rate.”

Marine Biology (p. 319) Have students check part “a” before moving onto part “b.”

Bacteria Growth (p. 320) Provide image of “bacterial culture” to make problem more applicable and relevant for student.

Half-Life of Radiation (p. 321) Require only parts “a” and “c” of this problem.

Students will engage with the following text, resources and tools:

Text:

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Online Resources incorporated through the year, include but not limited to:

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Students will write:

Students will define and compare/contrast given terms. Students will express their knowledge and skills in their own words, organize their thinking about the content, and write explanations to solve problems. Students will also relate real world situations using algebra terminology.

PART III: TRANSFER OF KNOWLEDGE AND SKILLS

DESCRIBE THE LEARNING EXPERIENCE.

How will students uncover content and build skills?

Opportunities for developing students' understanding in this chapter include: investigating algebra activities, problem solving workshops, modeling examples, using real-life application or other hands on activities such as projects. Technology such as animated algebra, Smart Board, and graphing calculators will also be explored through the learning experience. Other interests could include, but is not limited to alternative lesson openers, using note-taking strategies, math and history applications, and interdisciplinary applications.

Suggested warm-up activities, instructional strategies/activities, and assignments:

Section 6.1 Properties of Exponents:

Warm-up/Starting Options	Explorations p. T-291
Practice and Apply	p. 296-298 #1-32, 35, 36, 70-75 (odd numbers only)
Resources	Online Dynamic Classroom has all resources available. Review: Practice A and Practice B, Puzzle Time, Student Journal, and Skills Review Handbook Advanced: Enrichment and Extension, Cumulative Review

Section 6.3 Exponential Functions:

Warm-up/Starting Options	Explorations p. T-305
Practice and Apply	p. 310-312 #1-24, 64-67(odd numbers only)
Resources	Online Dynamic Classroom has all resources available. Review: Practice A and Practice B, Puzzle Time, Student Journal, and Skills Review Handbook Advanced: Enrichment and Extension, Cumulative Review

Section 6.4 Exponential Growth and Decay:

Warm-up/Starting Options	Explorations p. T-313
Practice and Apply	p. 319-322 #1-17, 19-30, 33-38, 73-79 (odd numbers only)
Resources	Online Dynamic Classroom has all resources available. Review: Practice 33 odd A and Practice B, Puzzle Time, Student Journal, and Skills Review Handbook Advanced: Enrichment and Extension, Cumulative Review

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Formative Assessments:

The effectiveness of the instructional program will be based on numerous activities and strategies including the following: teacher observations, students collaborating with peers, questioning strategies, student record-keeping, quizzes, exit/admit assignments, peer/self-assessments, learning/response logs, discussions and practice presentations.

ELL Accommodations/Modifications for Formative Assessments:

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The following assessments will be used to evaluate student learning, skill acquisition and academic achievement of the Standards of Mathematical Practice and the New Jersey Learning Standards for Mathematics listed under each chapter in the Geometry curriculum/syllabus at the conclusion of an instructional time period.

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Performance Tasks, Projects, Display of Student Work

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Black Horse Pike Regional School District Curriculum Template

ENGAGING STUDENTS ● FOSTERING ACHIEVEMENT ● CULTIVATING 21ST CENTURY GLOBAL SKILLS

Course Name: Algebra 1 ELL

Course Number: 031300

PART I: UNIT RATIONALE

WHY ARE STUDENTS LEARNING THIS CONTENT AND THESE SKILLS?

Course/Unit Title: Algebra 1/Polynomials and Factoring	Unit Summary: In this unit students identify, classify, add, subtract, and multiply polynomials. They use vertical and horizontal formats to find sums and differences of polynomials and use the distributive property, tables of products and patterns, (including the FOIL pattern, the square of a binomial pattern and the sum and difference pattern) to find products. They use polynomial equations to describe and solve real-world problems. Students will then factor polynomials and use factoring to solve equations, to find the zeros of functions, and to find the roots of equations. Finally, they factor polynomials completely using a variety of techniques.
Grade Level(s): 9-12	
Essential Question(s): - How do I add, subtract and multiply polynomials? - How do I factor polynomials? - How do I write and solve polynomial equations to solve problems?	Enduring Understanding(s): Students will be able to: - Add and subtract polynomials. - Multiply polynomials. - Find special products of polynomials. - Solve polynomial equations by factoring. - Factor $x^2 + bx + c$. - Factor $ax^2 + bx + c$. - Factor special products. - Factor polynomials completely.

PART II: INSTRUCTIONAL STRATEGIES AND RESOURCES

DESCRIBE THE LEARNING TARGETS.

After each target, identify the New Jersey Student Learning Standards that are applicable

Learning Target 1. Adding, Subtracting and Multiplying polynomial. <i>[Standard] - Understand that polynomials form a system analogous to the integers namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials.</i> 2. Factoring polynomials	NJSLS: 1. NJSLS.A.APR.A.1 2. NJSLS.A.CED.A.1, NJSLS.A.REI.B.4b, NJSLS.A.SSE.B.3.a,
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<i>[Standard] - Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions.</i> <i>[Standard] - Solve quadratic equations in one variable. Solve quadratic equations by inspection (e.g., for $x^2 = 49$), taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions and write them as $a \pm bi$ for real numbers a and b.</i> <i>[Standard] - Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression. Factor a quadratic expression to reveal the zeros of the function it defines.</i> <i>[Standard] - Prove polynomial identities and use them to describe numerical relationships. For example, the polynomial identity $(x^2 + y^2)^2 = (x^2 - y^2)^2 + (2xy)^2$ can be used to generate Pythagorean triples.</i> <i>[Standard] - Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function. Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context.</i> 3. Writing and solving polynomial equations <i>[Standard] - Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions.</i> <i>[Standard] - Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function. Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context.</i>	NJSLS.A.APR.C.4, NJSLS.F.IF.C.8a 3. NJSLS.A.CED.A.1, NJSLS.F.IF.C.8a
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Key Vocabulary necessary for ELL students for this chapter

Monomial Degree of a monomial Polynomial Binomial Trinomial Degree of a polynomial Standard form Leading coefficient closed
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Inter-Disciplinary Connections:

Real-World problem solving examples: Investments (p. 362) Define “investing” for students.
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Bracelets (p.363) Highlight and bold “more” for students.

Gym Membership (p.363) Highlight and bold “total” for students.

Velocity (p.363) Set up problem for students by taking words and showing what variables they represent.

Construction (p. 364) Provide standard form for students. Require only part “a” of problem.

Hockey (p.368) Define trapezoid and highlight zone for students.

Football (p.370) Provide area formula for a rectangle.

Optometry (p.376) Highlight and bold “more” for students.

Fireplace (p.380) Clarify what x axis and y axis each represent.

Arches (p.382) Provide synonym of “height” for “tall” for students.

Farming (p.388) Rewrite information from problem in bullet form to assist students in determining area.

Projector (p.389) Highlight that there are two questions, and thus, two answers that need to be provided.

Parking Lot (p. 389) Highlight that there are two questions, and thus, two answers that need to be provided.

Construction (p. 390) Define “paving” for students.

Wildlife Preserve (p.394) Rewrite information from problem in bullet form to assist students in determining area. Complete with teacher assistance as a class, not individually.

Sign Design (p.395) For part “b” only require one method.

Swimming Pool (p.396) Set up first two steps to guide students in properly completing this problem.

Envelope (p.396) Set up problem for students by taking words and showing what variables they represent.

Playground (p. 401) Highlight that there are two questions, and thus, two answers that need to be provided.

Painting (p.402) Highlight variable that is to be solved and complete first step for students.

Grasshopper (p. 402) Provide the number of inches in a foot as guidance for this problem.

Fish tank (p.406) Define “terrarium” for students. Provide area formula for the volume of a prism.

Birdhouse (p.407) Clarify what the problem is asking of in regards to “dimensions” for students.

Gift bag (p.408) Rewrite information from problem in bullet form to assist students in setting up problem. Clarify what the problem is asking of in regards to “dimensions” for students.

Magician (p.413) Require only parts “a” “b” and “c.”

Miniature Golf (p.415) Require only parts “a” and “b.”

Inter-Disciplinary problem solving examples:

Photography (p.370) Highlight and bold “combined.”

Biology (p.374) Rewrite information from problem in bullet form to assist students in setting up problem. Clarify what the problem is asking of in regards to “combinations” for students.

Genealogy (p.376) Clarify what the problem is asking of in regards to “combinations” for students.

Architecture (p.375) Define “renovation” and “extension.”

Photography (p.390) Highlight original picture size for students.

Photography (p.402) Check that part “a” is correct, before having students move onto part “b.”

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Suggested warm-up activities, instructional strategies/activities, and assignments:

Section 7.1 Adding and Subtracting Polynomials:

Warm-up/Starting Options	Explorations p. 357
Practice and Apply	p. 362 #1-4, 6-18 even, 22- 46 even, 53-57, 62-64
Resources	Online Dynamic Classroom has all resources available. Review: Practice A and Practice B, Puzzle Time, Student Journal, and Skills Review Handbook Advanced: Enrichment and Extension, Cumulative Review

Section 7.2 Multiplying Polynomials:

Warm-up/Starting Options	Explorations p. 365
Practice and Apply	p. 369 # 1, 4-24 even, 28-30 even, 44, 52-58
Resources	Online Dynamic Classroom has all resources available. Review: Practice A and Practice B, Puzzle Time, Student Journal, and Skills Review Handbook Advanced: Enrichment and Extension, Cumulative Review

Section 7.3 Special Products of Polynomials:

Warm-up/Starting Options	Explorations p. 371
Practice and Apply	p. 375 #1, 4-10 even, 16, 18, 22, 34, 37, 48-51
Resources	Online Dynamic Classroom has all resources available. Review: Practice A and Practice B, Puzzle Time, Student Journal, and Skills Review Handbook Advanced: Enrichment and Extension, Cumulative Review

Section 7.4 Solving Polynomial Equations in Factored Form:

Warm-up/Starting Options	Explorations p. 377
Practice and Apply	p. 381 #1, 2-16 even, 22-38 even, 41, 42, 44, 49-52
Resources	Online Dynamic Classroom has all resources available. Review: Practice A and Practice B, Puzzle Time, Student Journal, and Skills Review Handbook Advanced: Enrichment and Extension, Cumulative Review

Section 7.5 Factoring $x^2 + bx + c$:

Warm-up/Starting Options	Explorations p. 385
Practice and Apply	p. 389 #1, 2-38 even, 39, 46, 47 - 55
Resources	Online Dynamic Classroom has all resources available. Review: Practice A and Practice B, Puzzle Time, Student Journal, and Skills Review Handbook Advanced: Enrichment and Extension, Cumulative Review

Section 7.6 Factoring $ax^2 + bx + c$:

Warm-up/Starting Options	Explorations p. 391
Practice and Apply	p. 395 #1, 2-34 even, 38, 45-56
Resources	Online Dynamic Classroom has all resources available. Review: Practice A and Practice B, Puzzle Time, Student Journal, and Skills Review Handbook Advanced: Enrichment and Extension, Cumulative Review

Section 7.7 Factoring Special Products:

Warm-up/Starting Options	Explorations p. 397
Practice and Apply	p. 401 #1, 2-8 even, 16-32 even, 36-42 even, 46, 47, 49-56
Resources	Online Dynamic Classroom has all resources available. Review: Practice A and Practice B, Puzzle Time, Student Journal, and Skills Review Handbook Advanced: Enrichment and Extension, Cumulative Review

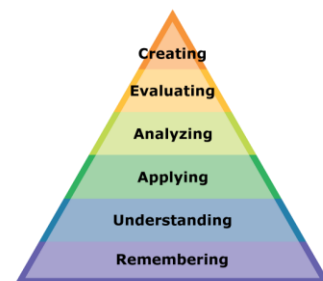
	STEM Video and Performance Task: Birds Dropping Food
Section 7.8 Factoring Polynomials Completely:	
Warm-up/Starting Options	Explorations p. 403
Practice and Apply	p. 407 #1, 2-34 even, 38, 40, 42, 50-57
Resources	Online Dynamic Classroom has all resources available. Review: Practice A and Practice B, Puzzle Time, Student Journal, and Skills Review Handbook Advanced: Enrichment and Extension, Cumulative Review

ELL Accommodations/Modifications:

Allow editing and revision before grading. Do not grade based on language usage. Explicitly teach language objectives. Simplify language used in instruction. Provide additional instruction including reviews, drills and opportunities for re-teaching. Teach in small groups when possible. Provide visual aids to enhance key concepts. Use Graphic Organizers. Assist students to underline key words or important facts in text. Provide prompts, photocopies of notes or outlines, or highlighted texts and materials. Provide frequent checks for comprehension. Provide simplified/additional instructions. Provide opportunity for student to provide oral responses to be recorded by teacher or paraprofessional. Accept correct answers on test or worksheets in any written form such as lists, phrases, or using inventive spelling.

PART IV: EVIDENCE OF LEARNING

IDENTIFY THE METHODS BY WHICH STUDENTS WILL DEMONSTRATE THEIR UNDERSTANDING OF CONTENT AND THEIR ABILITY TO APPLY SKILLS.
IDENTIFY BLOOM'S LEVELS.



Formative Assessments:

The effectiveness of the instructional program will be based on numerous activities and strategies including the following: teacher observations, students collaborating with peers, questioning strategies, student record-keeping, quizzes, exit/admit assignments, peer/self-assessments, learning/response logs, discussions and practice presentations.

ELL Accommodations/Modifications for Formative Assessments:

Provide frequent checks for comprehension. Simplify the language and format of the assessment to match the language utilized during instruction. Provide opportunity for student to provide oral responses to be recorded by teacher or paraprofessional. Accept correct answers on test or worksheets in any written form such as lists, phrases, or using inventive spelling.

Summative Assessments:

The following assessments will be used to evaluate student learning, skill acquisition and academic achievement of the Standards of Mathematical Practice and the New Jersey Learning Standards for Mathematics listed under each chapter in the Geometry curriculum/syllabus at the conclusion of an instructional time period.

- Diagnostic Pre-Test
- Chapter Tests
- Periodic Benchmark Tests
- End-Of –Course Assessment
- Standardized Tests

ELL Accommodations/Modifications for Summative Assessments:

Allow editing and revision before grading. Do not grade based on language usage. Provide simplified/additional instructions. Provide a word bank. Provide an opportunity for the student to take the test/re-test individually with a teacher or paraprofessional. Allow for the test to be read aloud. Simplify the language and format of the assessment to match the language utilized during instruction. Allow for extended time to complete the assessment. Provide opportunity for student to provide oral responses to be recorded by teacher or paraprofessional. Accept correct answers on test or worksheets in any written form such as lists, phrases, or using inventive spelling.

Performance Assessments:

Performance Tasks, Projects, Display of Student Work

ELL Accommodations/Modifications for Performance Assessments:

Allow editing and revision before grading. Do not grade based on language usage. Provide simplified/additional instructions. Provide examples of projects. Design projects and assessment for student that require reduced sentence or paragraph composition.

Black Horse Pike Regional School District Curriculum Template

ENGAGING STUDENTS ● FOSTERING ACHIEVEMENT ● CULTIVATING 21ST CENTURY GLOBAL SKILLS

Course Name: Algebra 1 ELL

Course Number: 031300

PART I: UNIT RATIONALE

WHY ARE STUDENTS LEARNING THIS CONTENT AND THESE SKILLS?

Course/Unit Title: Algebra 1/Graphing Quadratic Functions	Unit Summary: In this unit students graph quadratic functions and compare them to the parent graph. They find the axis of symmetry, the vertex, and minimum or maximum values. They solve quadratic equations by factoring, graphing, using square roots, completing the square, and using the quadratic formula. Students use the discriminant to determine the number of type of solutions of a quadratic equation. Finally, students determine whether a linear, exponential, or quadratic function best models a set of data.
Grade Level(s): 9-12	
Essential Question(s): - How do I graph quadratic functions? - How do I compare linear, exponential, and quadratic models?	Enduring Understanding(s): Students will be able to: - Graph $f(x) = ax^2$. - Graph $f(x) = ax^2 + c$. - Graph $f(x) = ax^2 + bx + c$. - Graph $f(x) = a(x - h)^2 + k$. - Compare linear, exponential, and quadratic models.

PART II: INSTRUCTIONAL STRATEGIES AND RESOURCES

DESCRIBE THE LEARNING TARGETS.

After each target, identify the New Jersey Student Learning Standards that are applicable

<u>Learning Target</u>	<u>NJSLS:</u>
1. Graphing quadratic functions. <i>[Standard] - Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.</i> <i>[Standard] - Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context. For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.</i> <i>[Standard] - For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.</i>	1. NJSLS.A.CED.A.2, NJSLS.A.CED.A.3, NJSLS.F.IF.B.4, NJSLS.F.IF.B.5, NJSLS.F.IF.C.7a, NJSLS.F.IF.C.7c, NJSLS.F.BF. B.3

[Standard] - Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. For example, if the function $h(n)$ gives the number of person-hours it takes to assemble n engines in a factory, then the positive integers would be an appropriate domain for the function.

[Standard] - Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. Graph linear and quadratic functions and show intercepts, maxima, and minima.

[Standard] - Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior.

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

2. Comparing linear, exponential and quadratic models

[Standard] - Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.

[Standard] - Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context. For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.

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

[Standard] - Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. Graph linear and quadratic functions and show intercepts, maxima, and minima.

[Standard] - Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior.

[Standard] - Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude.

[Standard] - Write a function that describes a relationship between two quantities. Determine an explicit expression, a recursive process, or steps for calculation from a context.

[Standard] - Distinguish between situations that can be modeled with linear functions and with exponential functions. Recognize situations in which one quantity changes at a constant rate per unit interval relative to another.

2. NJSLS.A.CED.A.2,
NJSLS.A.CED.A.3,
NJSLS.F.IF.B.4,
NJSLS.F.IF.C.7a,
NJSLS.F.IF.C.7c,
NJSLS.F.IF.C.7e,
NJSLS.F.BF.A.1a,
NJSLS.F.LE.A.1.b,
NJSLS.F.LE.A.1.c,
NJSLS.F.LE.A.3,
NJSLS.F.LE.B.5,
NJSLS.S.ID.B.6a

<i>[Standard] - Distinguish between situations that can be modeled with linear functions and with exponential functions. Recognize situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another.</i> <i>[Standard] - Observe using graphs and tables that a quantity increasing exponentially eventually exceeds a quantity increasing linearly, quadratic ally, or (more generally) as a polynomial function.</i> <i>[Standard] - Interpret the parameters in a linear or exponential function in terms of a context.</i> <i>[Standard] - Represent data on two quantitative variables on a scatter plot, and describe how the variables are related. Fit a function to the data; use functions fitted to data to solve problems in the context of the data. Use given functions or choose a function suggested by the context. Emphasize linear, quadratic, and exponential models.</i>	
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Key Vocabulary necessary for ELL students for this chapter

Quadratic function Parabola Vertex Axis of symmetry Vertical shrink Vertical stretch Reflection Zero of a function Translation Vertex of a parabola Maximum value Minimum value Independent variable Dependent variable Even function Odd function Vertex form of a quadratic function Intercept form Average rate of change

Inter-Disciplinary Connections:

Real-World problem solving examples: Satellite Dish (p.422) Remind students to use domain to find width and range to find depth. Bridge (p.423) Highlight points on arch that students should be using to determine height and width. Rope Strength (p.423) Define “breaking strength” and require only parts “a” and “b” of this problem.
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Glass (p.424) Highlight points on glass that students should be using to determine height and width. Require only part “a” of problem.”

Water Balloons (p.429) Remind students to utilize zero of a function for this problem.

Patio Area (p. 430) Provide graph outline for students to assist in their justification.

Path of a Waterfall (p. 430) Complete waterfall 1 as a class to model for students to complete 2 and 3.

Antenna (p.430) Rewrite information from problem in bullet form to assist students in setting up problem correctly.

Bridge Design (p.434) Direct students to solve for x coordinate of vertex first.

Water Balloons (p.435) Require use of graphing calculator so students can see the graphs visually in an appropriate sized window.

Fireworks (p.437) Provide reminder to students that time cannot be negative.

Bridge Design (p.437) Rewrite information from problem in bullet form to assist students in setting up problem correctly.

Aircraft Hanger (p. 437) Require graphing calculator to determine what function has a greater maximum value.

Archery (p.438) Check part “a” of problem before allowing students to move onto parts “b” and “c.”

Basketball (p.438) Provide visual for air cannon.

Dog Shelter (p.438) Guide students in finding y-coordinate of the vertex of the graph of the area function so they can progress in problem.

Falling Objects (p. 440) Provide reminder to students that time cannot be negative.

Water Fountain (p.445) Encourage students to use graphic calculator’s zero function and maximum feature to self-check work.

Bird Diving (p.447) Provide reminder to students that time cannot be negative.

Football (p.447) Provide image of football person punting.

Roller Coaster (p.448) Have students check graph of quadratic equation with graphing calculator.

Flare (p.448) Encourage students to use graphic calculator’s zero function and maximum feature to self-check work.

Birdbath (p.448) Remind students to use domain to find width and range to find depth.

Population (p.464) Rewrite information from problem in bullet form to assist students in setting up problem correctly. Require only parts “a” and “b” of problem. Provide linear and exponential function for students.

Bicycling (p.467) Highlight variables and what they represent for students.

Volleyball (p.467) Require only parts “a,” “b,” and “c” of problem.

Population (p.467) Remind students how to calculate rates of change.

Resorts (p.467) Direct students to use the intersect function of their graphing calculator.

Pets (p.468) Reduce wordiness in question and the overall number of questions combined into one for this problem.

Tennis (p.473) Provide images to allow students to visualize “serve” a tennis ball.

Inter-Disciplinary problem solving examples:

Geometry (p.422) Remind students to use domain to find width and range to find depth.

Velocity (p.428) Provide steps to follow to answer this multi-step problem. First, create a table of values, then sketch a graph.

Physics (p. 429) Remind students to utilize zero of a function for this problem.

Calculus (p. 438) Check part “a” of problem before allowing students to move onto parts “b” and “c.”

Astronomy (p.473) Provide students with the type of function that is expected so that they can provide the correct function that models the data.

Students will engage with the following text, resources and tools:

Text:

- Algebra 1, A Common Core Curriculum – Big Ideas Math, *Big Ideas Learning LLC., 2019*

Online Resources incorporated through the year, include but not limited to:

- BigIdeasMath.com – publisher on-line assignments, resources and text
- Desmos – online graphing tool
- ALEKS – web-based artificially intelligent software
- IXL – web-based software
- G Suite for education – Google Classroom, Docs, Drive, Mail, etc...

Calculators:

- TI – 84 Plus graphing calculator

The following 21st century skills and the 8 mathematical practices are embedded throughout the course and are evident in daily lessons, assignments, activities, assessments and projects:

21st Century skills:

- Critical thinking
- Creativity
- Collaboration
- Communication
- Information literacy
- Technology literacy
- Media literacy
- Flexibility
- Leadership
- Initiative
- Productivity
- Social skills

Mathematical Practices:

- Make sense of problems and persevere in solving them
- Reason abstractly and quantitatively
- Construct viable arguments and critique the reasoning of others
- Model with mathematics
- Use appropriate tools strategically
- Attend to precision
- Look for and make use of structure
- Look for and express regularity in repeated reasoning

Students will write:

Students will define and compare/contrast given terms. Students will express their knowledge and skills in their own words, organize their thinking about the content, and write explanations to solve problems. Students will also relate real world situations using algebra terminology.

PART III: TRANSFER OF KNOWLEDGE AND SKILLS

DESCRIBE THE LEARNING EXPERIENCE.

How will students uncover content and build skills.

Opportunities for developing students' understanding in this chapter include: investigating algebra activities, problem solving workshops, modeling examples, using real-life application or other hands on activities such as projects. Technology such as animated algebra, Smart Board, and graphing calculators will also be explored through the learning experience. Other interests could include, but is not limited to alternative lesson openers, using note-taking strategies, math and history applications, and interdisciplinary applications.

Suggested warm-up activities, instructional strategies/activities, and assignments:

Section 8.1 Graphing $f(x) = ax^2$:

Warm-up/Starting Options	Explorations p. 419
Practice and Apply	p. 423 #1, 2-20 even, 32-35
Resources	Online Dynamic Classroom has all resources available. Review: Practice A and Practice B, Puzzle Time, Student Journal, and Skills Review Handbook Advanced: Enrichment and Extension, Cumulative Review

Section 8.2 Graphing $f(x) = ax^2 + c$.

Warm-up/Starting Options	Explorations p. 425
Practice and Apply	p. 429 #1, 2-12 even, 18-28 even, 34, 38, 42-45
Resources	Online Dynamic Classroom has all resources available. Review: Practice A and Practice B, Puzzle Time, Student Journal, and Skills Review Handbook Advanced: Enrichment and Extension, Cumulative Review

Section 8.3 Graphing $f(x) = ax^2 + bx + c$:

Warm-up/Starting Options	Explorations p. 431
Practice and Apply	p. 436 #1, 2-10, 13-16, 20, 27, 28, 37, 38, 42, 50-53
Resources	Online Dynamic Classroom has all resources available. Review: Practice A and Practice B, Puzzle Time, Student Journal, and Skills Review Handbook Advanced: Enrichment and Extension, Cumulative Review
Section 8.4 Graphing $f(x) = a(x - h)^2 + k$:	
Warm-up/Starting Options	Explorations p. 441
Practice and Apply	p. 446 #2, 20-34 even, 35-38, 40-44 even, 70, 79-82
Resources	Online Dynamic Classroom has all resources available. Review: Practice A and Practice B, Puzzle Time, Student Journal, and Skills Review Handbook Advanced: Enrichment and Extension, Cumulative Review
Section 8.6 Comparing Linear, Exponential, and Quadratic Functions:	
Warm-up/Starting Options	Explorations p. 459
Practice and Apply	p. 465 #1-4, 6-20 even, 36, 43-50
Resources	Online Dynamic Classroom has all resources available. Review: Practice A and Practice B, Puzzle Time, Student Journal, and Skills Review Handbook Advanced: Enrichment and Extension, Cumulative Review STEM Video and Performance Assessment: Comparing Growth Models

ELL Accommodations/Modifications:

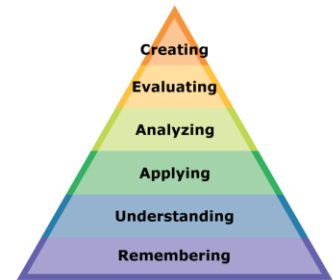
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PART IV: EVIDENCE OF LEARNING

IDENTIFY THE METHODS BY WHICH STUDENTS WILL DEMONSTRATE THEIR UNDERSTANDING OF CONTENT AND THEIR ABILITY TO APPLY SKILLS.

IDENTIFY BLOOM'S LEVELS.



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Performance Tasks, Projects, Display of Student Work

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Black Horse Pike Regional School District Curriculum Template

ENGAGING STUDENTS ● FOSTERING ACHIEVEMENT ● CULTIVATING 21ST CENTURY GLOBAL SKILLS

Course Name: Algebra 1 ELL

Course Number: 031300

PART I: UNIT RATIONALE

WHY ARE STUDENTS LEARNING THIS CONTENT AND THESE SKILLS?

Course/Unit Title: Algebra 1/Solving Quadratic Equations	Unit Summary: In this unit students solve quadratic equations by factoring, graphing, using square roots, completing the square, and using the quadratic formula. Students use the discriminant to determine the number of type of solutions of a quadratic equation. Students will simplify radical expressions, including rationalizing denominators. Students also add, subtract, and multiply radicals.
Grade Level(s): 9-12	
Essential Question(s): - How do I solve quadratic equations? - How do I use properties of radicals in expressions and equations?	Enduring Understanding(s): Students will be able to: - Solve quadratic equations by graphing. - Use square roots to solve quadratic equations. - Solve quadratic equations by completing the square. - Solve quadratic equations by the quadratic formula. - Interpret the discriminant. - Simplify radical expressions.

PART II: INSTRUCTIONAL STRATEGIES AND RESOURCES

DESCRIBE THE LEARNING TARGETS.

After each target, identify the New Jersey Student Learning Standards that are applicable

<u>Learning Target</u>	<u>NJSLS:</u>
1. Using properties of radicals in expressions and equations. <i>[Standard] - Solve simple rational and radical equations in one variable, and give examples showing how extraneous solutions may arise.</i>	1. NJSLS.A.REI.A.2
2. Solving quadratic equations <i>[Standard] - Create equations and inequalities in one variable solving and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions.</i> <i>[Standard] - Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.</i> <i>[Standard] - Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context. For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.</i>	2. NJSLS.A.CED.A.1, NJSLS.A.CED.A.2, NJSLS.A.CED.A.3, NJSLS.REI.B.4a, NJSLS.A.REI.B.4b, NJSLS.A.REI.D.11, NJSLS.A.SSE.B.3, NJSLS.F.BF.B.3, NJSLS.F.IF.B.4.a, NJSLS.F.IF.C.7a,

<i>[Standard] - Solve quadratic equations in one variable. Use the method of completing the square to transform any quadratic equation in x into an equation of the form $(x - p)^2 = q$ that has the same solutions. Derive the quadratic formula from this form.</i> <i>[Standard] - Solve quadratic equations in one variable. Solve quadratic equations by inspection (e.g., for $x^2 = 49$), taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions and write them as $a \pm bi$ for real numbers a and b.</i> <i>[Standard] - Explain why the x-coordinates of the points where the graphs of the equations $y = f(x)$ and $y = g(x)$ intersect are the solutions of the equation $f(x) = g(x)$; find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where $f(x)$ and/or $g(x)$ are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.</i> <i>[Standard] - Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression. Factor a quadratic expression to reveal the zeros of the function it defines.</i> <i>[Standard] - Identify the effect on the graph of replacing $f(x)$ by $f(x) + k$, $k f(x)$, $f(kx)$, and $f(x + k)$ for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them.</i> <i>[Standard] - Find inverse functions. Solve an equation of the form $f(x) = c$ for a simple function f that has an inverse and write an expression for the inverse. For example, $f(x) = 2x^3$ or $f(x) = (x+1)/(x-1)$ for $x \neq 1$.</i> <i>[Standard] - Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. Graph linear and quadratic functions and show intercepts, maxima, and minima.</i> <i>[Standard] - Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior.</i> <i>[Standard] - Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function. Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context.</i>	NJSLS.F.IF.C.7c, NJSLS.F.IF.C.8a
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Key Vocabulary necessary for ELL students for this chapter

Counterexample
 Radical expression
 Simplest form of a radical
 Rationalizing the denominator
 Conjugates
 Like radicals
 Radicand
 Perfect cube
 Quadratic equation
 Root
 Zero of a function
 Completing the square
 Perfect square trinomial
 Vertex form of a quadratic function
 Quadratic formula
 Discriminant
 System of linear equations
 System of nonlinear equations

Inter-Disciplinary Connections:

Real-World problem solving examples:

View of the horizon (p.483) Highlight variable that is to be solved and complete first step for students.

The Parthenon (p. 483) Provide proportion for students as the first step to solving this problem.

Dropping an Object (p.486) Highlight variable that is to be solved and complete first step for students.

Electric Current (p.486) Clarify that variable P represents 147 watts.

Flag (p.487) Provide ratio for golden rectangle.

Football (p.493) Detail to students that step one is to write the equation in standard form.

Golf (p.495) Clarify the demand “interpret” for students in detailing what students should be doing for part “a.”

Volleyball (p.495) Complete only part “b.”

Softball (p.496) Reword problem in bullet form clearly identifying variables. Highlight what is being asked in parts “a,” “b,” and “c.”

Fire Hose (p.496) Provide visual of fire hose.

Fish tank (p.500) Direct students to use the positive square root because negative solutions do not make sense in this context.

Traffic Sign (p.500) Provide two ways of efficiently finding the various values for A to provide choices to students.

Pond (p.501) Direct students to use the positive square root because negative solutions do not make sense in this context.

Bleachers (p.501) Clarify that “h” is equal to 24 feet.

Rug (p.502) Highlight the inner square that is the focus of this problem.

Fishing (p.504) Provide visual of a “fishing lure.”

Creating a Chalk board (p.510) Write out words for the problem. Provide variable and that it represents width.

Throwing an object (p.513) Remind students to find the maximum height, you must find the maximum value.

Patio (p.513) Use a verbal model to write an equation that represents the area of the patio.

Poster (p.513) Highlight variable that is to be solved

Fencing (p.513) Model what “use substitution” suggests.

Knitting (p.514) Write out words for the problem. Provide variables and exactly what each represent.

Dolphins (p.521) Provide quadratic formula.

Trout Population (p.521) Require only part “a” of problem.”

Fountain (p.522) Clarify where north shore is on diagram.

Camping (p.522) Read problem out loud and highlight the directions the child must walk that is detailed in problem.

Fencing (p.523) Complete part “a” as a class to set students up for success for part “b.”

Football (p.523) Require only part “a” of the problem. Reword problem in bullet form clearly identifying functions.

Space Travel (p.523) Reword problem in bullet form clearly identifying functions. Write out words for the problem.

Boating (p.531) Use graphing calculator and appropriate viewing window to see if paths cross.

Amusement Parks (p.537) Provide visual of a ride to place values on in setting up this problem.

Inter-Disciplinary problem solving examples:

Astronomy (p.486) Define “orbital period” before beginning problem.

Investing (p.486) Place formula values in proper columns for students.

Literature (p.487) Provide ratio for golden rectangle.

Architecture (p.487) Highlight variables “a” and “b” to eliminate distractions of the rest of the diagram.

History (p.495) Set up table of values for students.

Architecture (p.511) Require part “a” of problem only.

Art (p.511) Provide formula for volume.

Geometry (p.513) Use a verbal model to write an equation that represents the area of the patio.

Physics – Velocity (p.513) Remind students to find the maximum height, you must find the maximum value.

Stock Market (p.514) Write out words for the problem. Provide variable and that it represents width.

Architecture (p.531) Label the pylons.

Students will engage with the following text, resources and tools:

Text:

- Algebra 1, A Common Core Curriculum – Big Ideas Math, *Big Ideas Learning LLC., 2019*

Online Resources incorporated through the year, include but not limited to:

- BigIdeasMath.com – publisher on-line assignments, resources and text
- Desmos – online graphing tool
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- IXL – web-based software
- G Suite for education – Google Classroom, Docs, Drive, Mail, etc...

Calculators:

- TI – 84 Plus graphing calculator

The following 21st century skills and the 8 mathematical practices are embedded throughout the course and are evident in daily lessons, assignments, activities, assessments and projects:

21st Century skills:

- Critical thinking
- Creativity
- Collaboration
- Communication
- Information literacy
- Technology literacy
- Media literacy
- Flexibility
- Leadership
- Initiative
- Productivity
- Social skills

Mathematical Practices:

- Make sense of problems and persevere in solving them
- Reason abstractly and quantitatively
- Construct viable arguments and critique the reasoning of others
- Model with mathematics
- Use appropriate tools strategically
- Attend to precision
- Look for and make use of structure
- Look for and express regularity in repeated reasoning

Students will write:

Students will define and compare/contrast given terms. Students will express their knowledge and skills in their own words, organize their thinking about the content, and write explanations to solve problems. Students will also relate real world situations using algebra terminology.

PART III: TRANSFER OF KNOWLEDGE AND SKILLS

DESCRIBE THE LEARNING EXPERIENCE.

How will students uncover content and build skills.

Opportunities for developing students' understanding in this chapter include: investigating algebra activities, problem solving workshops, modeling examples, using real-life application or other hands on activities such as projects. Technology such as animated algebra, Smart Board, and graphing calculators will also be explored through the learning experience. Other interests could include, but is not limited to alternative lesson openers, using note-taking strategies, math and history applications, and interdisciplinary applications.

Suggested warm-up activities, instructional strategies/activities, and assignments:

Section 9.1 Properties of Radicals:

Warm-up/Starting Options	Explorations p. 479
Practice and Apply	p. 485 #1-4, 5-10, 14-28 even, 37, 46-52 even, 61, 63, 75-80, 83-88, 108-111
Resources	Online Dynamic Classroom has all resources available.

	Review: Practice A and Practice B, Puzzle Time, Student Journal, and Skills Review Handbook Advanced: Enrichment and Extension, Cumulative Review STEM Video and Performance Assessment: Golden Rectangle
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Section 9.2 Solving Quadratic Equations by Graphing:

Warm-up/Starting Options	Explorations p. 489
Practice and Apply	p. 494 #1-4, 6-42 even, 53, 54, 66, 67
Resources	Online Dynamic Classroom has all resources available. Review: Practice A and Practice B, Puzzle Time, Student Journal, and Skills Review Handbook Advanced: Enrichment and Extension, Cumulative Review

Section 9.3 Solving Quadratic Equations using Square Roots:

Warm-up/Starting Options	Explorations p. 497
Practice and Apply	p. 1, 2-30 even, 31-34, 40, 45-50
Resources	Online Dynamic Classroom has all resources available. Review: Practice A and Practice B, Puzzle Time, Student Journal, and Skills Review Handbook Advanced: Enrichment and Extension, Cumulative Review

Section 9.4 Solving Quadratic Equations by Completing the Square:

Warm-up/Starting Options	Explorations p. 505
Practice and Apply	p. 511 #17-22, 25, 26, 33, 78-80
Resources	Online Dynamic Classroom has all resources available. Review: Practice A and Practice B, Puzzle Time, Student Journal, and Skills Review Handbook Advanced: Enrichment and Extension, Cumulative Review

Section 9.5 Solving Quadratic Equations Using the Quadratic Formula:

Warm-up/Starting Options	Explorations p. 515
Practice and Apply	p. 521 #1, 2-48 even, 49, 50-56 even, 72, 83-85
Resources	Online Dynamic Classroom has all resources available.

	Review: Practice A and Practice B, Puzzle Time, Student Journal, and Skills Review Handbook Advanced: Enrichment and Extension, Cumulative Review
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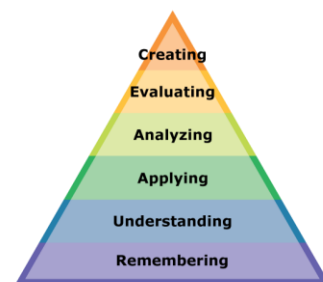
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PART IV: EVIDENCE OF LEARNING

IDENTIFY THE METHODS BY WHICH STUDENTS WILL DEMONSTRATE THEIR UNDERSTANDING OF CONTENT AND THEIR ABILITY TO APPLY SKILLS.

IDENTIFY BLOOM'S LEVELS.



Formative Assessments:

The effectiveness of the instructional program will be based on numerous activities and strategies including the following: teacher observations, students collaborating with peers, questioning strategies, student record-keeping, quizzes, exit/admit assignments, peer/self-assessments, learning/response logs, discussions and practice presentations.

ELL Accommodations/Modifications for Formative Assessments:

Provide frequent checks for comprehension. Simplify the language and format of the assessment to match the language utilized during instruction. Provide opportunity for student to provide oral responses to be recorded by teacher or paraprofessional. Accept correct answers on test or worksheets in any written form such as lists, phrases, or using inventive spelling.

Summative Assessments:

The following assessments will be used to evaluate student learning, skill acquisition and academic achievement of the Standards of Mathematical Practice and the New Jersey Learning Standards for Mathematics listed under each chapter in the Geometry curriculum/syllabus at the conclusion of an instructional time period.

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Performance Tasks, Projects, Display of Student Work

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Black Horse Pike Regional School District Curriculum Template

ENGAGING STUDENTS ● FOSTERING ACHIEVEMENT ● CULTIVATING 21ST CENTURY GLOBAL SKILLS

Course Name: Algebra 1 ELL

Course Number: 031300

PART I: UNIT RATIONALE

WHY ARE STUDENTS LEARNING THIS CONTENT AND THESE SKILLS?

Course/Unit Title: Algebra 1/Radical Functions and Equations	Unit Summary: In this unit students graph square root functions. They solve radical equations, including equations with extraneous solutions.
Grade Level(s): 9-12	
Essential Question(s): - How do I graph square root functions? - How do I solve radical equations?	Enduring Understanding(s): Students will be able to: - Graph square root functions. - Solve radical equations.

PART II: INSTRUCTIONAL STRATEGIES AND RESOURCES

DESCRIBE THE LEARNING TARGETS.

After each target, identify the New Jersey Student Learning Standards that are applicable

Learning Target 1. Graphing Square Root Functions <i>[Standard] - Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. Graph square root, cube root, and piecewise-defined functions including step functions and absolute value functions.</i> 2. Using properties of radicals in expressions and equations. <i>[Standard] - Solve simple rational and radical equations in one variable, and give examples showing how extraneous solutions may arise.</i>	NJSLS: 1. NJSLS.F.IF.C.7b 2. NJSLS.A.REI.A.2
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Key Vocabulary necessary for ELL students for this chapter

Rational
Square root function
Radical function
Radicand
Transformation
Average rate of change
Parent function
Real number
Cube root function
Integer
Index
Radical equation
Extraneous solution
Radical expression
Inverse
Inverse relation
Inverse function
Input
Output
Inverse operations
Reflection
Line of reflection

Inter-Disciplinary Connections:

Real-World problem solving examples:

Van Speed (p.549) Scan the graph with students. Specifically define and clarify “skid” and “drag.” Clarify that problem is requesting a comparison of two answers.

Fire Hose (p.549) Define “nozzle,” “flow pressure” and “exceed.” Encourage use of trace feature of graphing calculator.

Long Jump (p.550) Complete part “a” of problem together as a class before requiring part “b” to be completed individually.

Pendulum (p.563) Encourage use of trace feature of graphing calculator. Clarify “twice as long.”

BASE Jumping (p.564) Bold actual question in this wordy problem

Hair Dryer (p. 565) Provide list of variables and what they represent for the formula provided.

Trapeze Artist (p.565) Define “as long.” Provide list of variables and what they represent for the formula provided.

Inter-Disciplinary problem solving examples:

Physics (p.547) List steps that must be completed for this problem to be solved beginning with graphing the function and comparing rates of change.

Velocity (p. 549) Scan the graph with students. Specifically define and clarify “skid” and “drag.” Clarify that problem is requesting a comparison of two answers.

Geometry (p.566) Define and point to “slant” in visual.

Music (p.566) Rewrite information from problem in bullet form to assist students in determining tension.

Students will engage with the following text, resources and tools:

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Suggested warm-up activities, instructional strategies/activities, and assignments:

Section 10.1 Graphing Square Root Functions:

Warm-up/Starting Options	Explorations p. 543
Practice and Apply	p. 548 #1-4, 21-25, 29, 30, 35, 38-44 even, 50, 61-63
Resources	Online Dynamic Classroom has all resources available. Review: Practice A and Practice B, Puzzle Time, Student Journal, and Skills Review Handbook Advanced: Enrichment and Extension, Cumulative Review STEM Video and Performance Assessment: Tsunami!

Section 10.3 Solving Radical Equations:

Warm-up/Starting Options	Explorations p. 559
Practice and Apply	p. 564 #1, 2-32 even, 50-60, 72, 84-89
Resources	Online Dynamic Classroom has all resources available.

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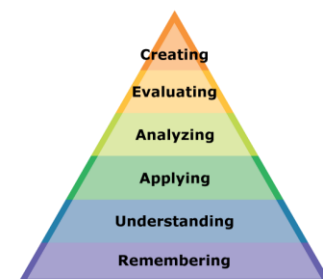
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Course Name: Algebra 1 ELL

Course Number: 031300

PART I: UNIT RATIONALE

WHY ARE STUDENTS LEARNING THIS CONTENT AND THESE SKILLS?

Course/Unit Title: Algebra 1/Data Analysis	Unit Summary: In this unit students interpret data displays. Students describe the shapes of data distributions. Students represent data in different ways. Finally students analyze data.
Grade Level(s): 9-12	
Essential Question(s): - How can you describe the variation of a data set? - How can you use a box-and-whisker plot to describe a data set? - How can you use a histogram to characterize the basic shape of a distribution? - How can you read and make a two-way table?	Enduring Understanding(s): Students will be able to: - Compare the mean, median, and mode of a data set. - Find the range and standard deviation of a data set. - Identify the effects of transformations on data. - Use box-and-whisker plots. - Interpret box-and-whisker plots. - Use box-and-whisker plots to compare data sets. - Describe the shapes of distributions. - Use the shapes of data distributions to choose appropriate measures. - Compare data distributions. - Find and interpret marginal frequencies. - Make two-way tables. - Find relative and conditional relative frequencies. - Use two-way tables to recognize associations in data.

PART II: INSTRUCTIONAL STRATEGIES AND RESOURCES

DESCRIBE THE LEARNING TARGETS.

After each target, identify the New Jersey Student Learning Standards that are applicable

Learning Target	NJSLS:
1. Interpret Data Displays <i>[Standard] – Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).</i>	1. NJSLS.S.ID.A.3
2. Analyze Data Distributions <i>[Standard] – Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two of more different data sets.</i>	2. NJSLS.S.ID.A.2, NJSLS.S.ID.A.3
	3. NJSLS.S.ID.A.1, NJSLS.S.ID.B.5

[Standard] – Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).

3. Represent Data in Different Ways

[Standard] – Represent data with plots on the real number line (dot plots, histograms, and box plots).

[Standard] – Summarize categorical data for two categories in two-way frequency tables. Interpret relative frequencies in the context of the data (including joint, marginal, and conditional relative frequencies). Recognize possible associations and trends in the data.

Key Vocabulary necessary for ELL students for this chapter

Measure of center

Mean

Median

Mode

Outlier

Measure of variation

Range

Standard deviation

Data transformation

Box and whisker plot

Quartile

Five number summary

Interquartile range

Histogram

Frequency table

Two-way table

Joint frequency

Marginal frequency

Joint relative frequency

Marginal relative frequency

Conditional relative frequency

Qualitative (Categorical) data

Quantitative data

Misleading graph

Inter-Disciplinary Connections:

Real-World problem solving examples:

Altitudes of Airplanes (p.589) Provide definition of each center of measure being questioned.

Wages (p.589) Provide definition of standard deviation.

Movies (p.590) Do not penalize student if math is correct, but reason is weak as to why student supports a certain center of measure.

Polar Bears (p.590) Remind students that outliers usually have the greatest effect on the mean.

Emails (p.590) Set up sentence starter with "One possible explanation for the outlier is..."

Golfers (p.590) Order the data for the range as a class before computation is completed as a student.

Baseball (p.591) Remind students that the range is the difference of the greatest and the least values.

Bowling (p.591) Define consistent before students begin determining each center of measure.

Favorite Food (p.592) Focus student thought with the key word "most" when examining this table.

Adventure Club (p.592) Eliminate erroneous wording that is not necessary for this simple visual problem.

Basketball (p.594) Provide step by step direction beginning with ordering the data, drawing a number line, and then drawing a box.

Shopping (p.596) Provide visuals of what skewed left, skewed right and symmetric look like to assist in choosing correct characterization.

Studying (p.597) Provide step by step direction beginning with ordering the data, drawing a number line, and then drawing a box.

Fishing (p.597) Suggest to students that if they can draw a line through the median of a box and whisker plot, and each side is approximately a mirror image of the other, then the distribution is symmetric.

Prices of Entrees (p.597) Require only part "b" of problem.

Baseball (p.598) Remind class that the interquartile range is the difference of the third quartile and the first quartile.

Car Sales (p.598) Highlight and bold "more" and "worst" to focus students on prompt of question.

Cell Phones (p.598) Do not require parts "b" and "e" of problem.

Speed (p.601) Highlight and bold that the question requires six intervals.

Shoe Ownership (p.603) Accept response distribution even if it is not in complete sentences.

Volunteer Hours (p. 604) Pre label and draw each axis for students.

Online Hours (p.604) Pre label and draw each axis for students.

ATM Withdrawals (p.604) Highlight and bold that the question requires seven intervals.

IQ Scores (p.605) Highlight and bold that the question requires five intervals.

Temperature (p.605) Provide sentence starters and possible multiple choice options to guide students in comparing the distributions.

Prices of Entrees (p.605) Prompt students that question is requiring all measures of central tendencies.

Wait times at a Restaurant (p.606) Do not require the second part of part "b" nor part "c."

Waterfall Height (p.608) Provide key that defines all measures of central tendencies.

Mountain Bikes (p.608) For part "b" set up sentence starter with "The outlier affects..."

Cell Phones (p.610) Remind students that the sum of the total row should be equal to the sum of the total column.

Exercise Habits (p.613) Set up sentence starter with "Yes, there appears to be a..."

Computer Sharing (p.613) Scan table and verbalize table with students before students independently look for an association.

School Activities (p.614) Before beginning problem, define “surveyed.” Remind students that marginal frequencies are the sums of the rows and columns in a two-way table.

Exercise Preference (p.615) Before beginning problem, define “aerobic,” “anaerobic” and “prefer.”

Fundraiser (p.615) Remind students that when you use column totals, the sum of the conditional relative frequencies for each column should equal to 1.

Menu (p.615) Scan table and verbalize table with students before students independently look for an association.

Mascot (p.616) Circle “hawk” and “cartoon” on table to focus students to the part of the table they need to refer to for success on this question.

TV Preferences (p.616) Set up sentence starter with “Yes/no, there appears to be a...”

Skiing (p.616) Direct students to use conditional relative frequencies to address this problem.

Movies (p.616) Set up table and label table for students. Do not require part “b” of problem.

Tickets (p.616) Set up table and label table for students.

Inter-Disciplinary problem solving examples:

Stock Market (p.590) Provide key that defines all measures of central tendencies. Do not require part “c” of problem.

Music (p.595) Remind students that a long whisker or box indicates that the data are more spread out.

Music (p.606) Provide step by step direction beginning with making a double box and whisker plot and then comparing the numbers of songs downloaded.

Time Spent on a Project (p.608) Provide key that defines all measures of central tendencies.

Quiz Scores (p.608) Remind students that if all the bars of a histogram are about the same height, then the distribution is a flat, or uniform distribution.

Presentations (p.608) Highlight and bold that the question requires five intervals.

Music (p.611) Set up and label table for students.

Majors (p.612) Remind students that they can find a conditional relative frequency using a row total or a column total of a two-way table.

Degrees (p.614) Remind students that marginal frequencies are the sums of the rows and columns in a two-way table.

Foreign Language (p.615) Set up and label table for students.

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Suggested warm-up activities, instructional strategies/activities, and assignments:

Section 11.1 Measures of Central Tendency and Variation:

Warm-up/Starting Options	Explorations p. 585
Practice and Apply	p. 590 #1-4, 6-30 even, 31, 32, 34, 39-47
Resources	Online Dynamic Classroom has all resources available. Review: Practice A and Practice B, Puzzle Time, Student Journal, and Skills Review Handbook Advanced: Enrichment and Extension, Cumulative Review

Section 11.2 Box-and-Whisker Plots:

Warm-up/Starting Options	Explorations p. 597
Practice and Apply	p. 597 #1-8 10-16 even, 20
Resources	Online Dynamic Classroom has all resources available. Review: Practice A and Practice B, Puzzle Time, Student Journal, and Skills Review Handbook Advanced: Enrichment and Extension, Cumulative Review

Section 11.3 Shapes of Distributions:

Warm-up/Starting Options	Explorations p. 599
Practice and Apply	p.604 #1, 2-12 even, 22, 23, 25-27
Resources	Online Dynamic Classroom has all resources available. Review: Practice A and Practice B, Puzzle Time, Student Journal, and Skills Review Handbook Advanced: Enrichment and Extension, Cumulative Review STEM Video and Performance Assessment: Shoe Ownership

Section 11.4 Two-Way Tables:

Warm-up/Starting Options	Explorations p. 609
Practice and Apply	p. 614 #1-4, 6-18 even, 24, 30, 33, 34
Resources	Online Dynamic Classroom has all resources available. Review: Practice A and Practice B, Puzzle Time, Student Journal, and Skills Review Handbook Advanced: Enrichment and Extension, Cumulative Review

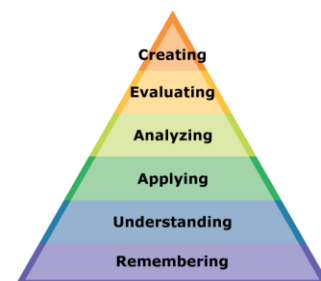
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ELL Accommodations/Modifications for Summative Assessments:

Allow editing and revision before grading. Do not grade based on language usage. Provide simplified/additional instructions. Provide a word bank. Provide an opportunity for the student to take the test/re-test individually with a teacher or paraprofessional. Allow for the test to be read aloud. Simplify the language and format of the assessment to match the language utilized during instruction. Allow for extended time to complete the

assessment. Provide opportunity for student to provide oral responses to be recorded by teacher or paraprofessional. Accept correct answers on test or worksheets in any written form such as lists, phrases, or using inventive spelling.