Black Horse Pike Regional School District
Where inspiring excellence is our standard, and student achievement is the result.

ML Algebra 1
Course Number: 033800

Updated: June 2024

PART I: UNIT RATIONALE

<u>WHY</u> ARE STUDENTS LEARNING THIS CONTENT AND THESE SKILLS?

Unit Title: Solving Linear Equations	
In this unit, students will explore the foundational skills related to solving linear equations and the connected skills of rewriting equations and formulas.	
Essential Questions	**Learning Targets/Objectives**
1. How can you use simple equations to solve real-life problems? 2. How can you use multi-step equations to solve real-life problems? 3. How can you solve an equation that has variables on both sides? 4. How can you use a formula for one measurement to write a formula for a different measurement?	Students will be able to: • Solve simple equations • Solve multi-step equations • Solve equations with variables on both sides • Rewrite literal equations • Rewrite formulas
Tier 2 Vocabulary *High-frequency words used throughout the unit*	**Tier 3 Vocabulary** *Discipline-specific words used throughout the unit*
Less, more, add, subtract, multiply, divide	Profit, sum, quotient, inverse operations, equivalent, expression, solution

PART II: INSTRUCTIONAL STRATEGIES AND RESOURCES
DESCRIBE THE LEARNING TARGETS.

New Jersey Student Learning Standards That Support Learning Targets	
2023 New Jersey Student Learning Standards for Mathematics	
1. A-CED.A.1	1. Create equations and inequalities in one variable and use them to solve problems. Climate Change Example: Students may create equations and/or inequalities to represent the economic impact of climate change.
2. A-REI.A.1	2. 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.
3. A-REI.B.3	3. Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.
4. N.Q.A.1	4. Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas, and choose and interpret the scale and the origin in graphs and data displays.
5. A-SSE.A.1b	5. Interpret complicated expressions by viewing one or more of their parts as a single entity.
NJSLS	**Interdisciplinary Connections**
1. HS-PS2-1	1. Analyze data to support the claim that Newton's second law of motion describes the mathematical relationship among the net force on a macroscopic object, its mass, and its acceleration
2. HS-PS2-2	2. Use mathematical representations to support the claim that the total momentum of a system of objects is conserved when there is no net force on the system
3. L.KL.9-10.2.A	3. Acquire and use accurately general academic and domain-specific words and phrases, sufficient for reading, writing, speaking, and listening at the college and career readiness level.

4.	W.IW.9–10.2	4.	Write informative/explanatory texts (including the narration of historical events, scientific procedures/ experiments, or technical processes) to examine and convey complex ideas, concepts, and information clearly and accurately through the effective selection, organization, and analysis of content.
5.	SL.PE.9-10.1.D	5.	Respond thoughtfully to various perspectives, summarize points of agreement and disagreement, and justify own views. Make new connections in light of the evidence and reasoning presented.
6.	SL.PI.9-10.4	6.	Present information, findings, and supporting evidence clearly, concisely, and logically. The content, organization, development, and style are appropriate to task, purpose, and audience

2020 New Jersey Student Learning Standards for Career Readiness, Life Literacies, and Key Skills

1.	9.1.12.CDM.1	1.	Identify the purposes, advantages, and disadvantages of debt.
2.	9.1.12.CDM.8	2.	Compare and compute interest and compound interest and develop an amortization table using business tools.
3.	9.2.12.CAP.5	3.	Assess and modify a personal plan to support current interests and postsecondary plans.
4.	9.4.12.CI.1	4.	Demonstrate the ability to reflect, analyze, and use creative skills and ideas.
5.	9.4.5.DC.4	5.	Model safe, legal, and ethical behavior when using online or offline technology
6.	9.4.12.CT.2	6.	Explain the potential benefits of collaborating to enhance critical thinking and problem-solving.

2020 New Jersey Student Learning Standards for Computer Science and Design Thinking

1.	8.1.2.AP.4	1.	Break down a task into a sequence of steps.

The 8 Mathematical Practices are embedded throughout the course and are evident in daily lessons, assignments, activities, assessments, and projects:

Make sense of problems and persevere in solving them: Take time to analyze the given information and what the problem is asking to help you to plan a solution pathway. Throughout the unit students are given problems that require them to:
- Explain the Meaning
- Find Entry Points
- Analyze Givens
- Interpret a Solution
- Make a Plan
- Consider Similar Problems
- Check Progress
- Consider Simpler Forms
- Problem Solve

Reason abstractly and quantitatively: Investigate specific examples and represent them symbolically, and observe the relationships in numbers or symbols to derive conclusions about a concrete instance. Throughout the unit students are given problems that require them to:
- Make Sense of Quantities
- Use Equations
- Use Expressions
- Understand Quantities
- Use Operations
- Contextualize
- Relationships
- Reason Abstractly

Construct viable arguments and critique the reasoning of others: Make and justify conclusions and decide whether others' arguments are correct or flawed. Throughout the unit students are given problems that require them to:
- Use Assumptions
- Use Defi nitions
- Use Prior Results
- Make Conjectures
- Build Arguments
- Analyze Conjectures
- Use Counterexamples

- Justify Conclusions
- Compare Arguments
- Construct Arguments
- Listen and Ask Questions
- Critique Reasoning
- Use Logic
- Error Analysis

Model with mathematics: Apply the mathematics to a real-life problem, and you interpret mathematical results in the context of the situation. Throughout the unit students are given problems that require them to:
- Apply Mathematics
- Simplify a Solution
- Use a Diagram
- Use a Table
- Use a Graph
- Use a Formula
- Analyze Relationships
- Interpret Results
- Model Real Life

Use appropriate tools strategically: Know what tools are available and think about how each tool might help solve a mathematical problem. Use a tool for its advantages, while being aware of its limitations. Throughout the unit students are given problems that require them to:
- Choose Tools
- Recognize Usefulness of Tools
- Use Other Resources
- Use Technology to Explore

Attend to precision: Develop a habit of being careful how you talk about concepts, label your work, and write your answers. Throughout the unit students are given problems that require them to:
- Communicate Precisely
- Use Clear Definitions
- State the Meaning of Symbols
- Specify Units
- Label Axes
- Calculate Accurately
- Understand Mathematical Terms

Look for and make use of structure: Look closely to see structure within a mathematical statement, or step back for an overview to see how individual parts make one single object. Throughout the unit students are given problems that require them to:
- View as Components
- Look for Patterns
- Look for Structure

Look for and express regularity in repeated reasoning: Notice patterns and make generalizations. Keeping in mind the goal of a problem helps you evaluate reasonableness of answers along the way. Throughout the unit students are given problems that require them to:
- Repeat Calculations
- Find General Methods
- Maintain Oversight
- Evaluate Results

Resources
Textbook
Textbook: Algebra I, A Common Core Curriculum– Big Ideas Math, Big Ideas Learning LLC, 2019
Online Resources
[Desmos Activities](#)   [Pear Assessment](#)   [IXL](#)   [Quizizz](#)   [EdPuzzle](#)   [Canva](#)   [Khan Academy](#)   [Inside Mathematics](#)   [NJDOE Digital Item Library](#)   [New Jersey Center for Teaching and Learning](#)   [New Jersey Climate Education Hub](#)
Videos
[Khan Academy- Equations with Variables on Both Sides](#)
Integrated Technology
- Google Suite: Google Classroom, Docs, Drive, Mail, etc…   - Devices: - Chromebooks   - Texas Instrument TI-84 Plus Graphing Calculator
ML Resources
Multi-Language Glossary

Gifted & Talented Resources
● Leveled Assessments ● Enrichment worksheets

PART III: TRANSFER OF KNOWLEDGE AND SKILLS

DESCRIBE THE LEARNING EXPERIENCE.

How will students uncover content and build skills?

Section 1.1 Solving Simple Equations		
Specific Learning Objective	**Warm-Up/Starting Options**	**Practice & Apply Exercises**
● Solve simple equations	**Warm Up:** Have students answer Start Thinking and/or Warm Up questions from Lesson 1.1 in the Big Ideas Resources file. Review the answers as a class.	Big Ideas Text p. 8-10 #1-4, 5-45 (odd only), 50, 58-65

Section 1.2 Solving Multi-Step Equations

Specific Learning Objective	Warm-Up/Starting Options	Practice & Apply Exercises
• Solve multi-step equations	**Warm Up:** Have students answer Start Thinking and/or Warm Up questions from Lesson 1.2 in the Big Ideas Resources file. Review the answers as a class.	Big Ideas Text p. 16-18 #1-44 (odd only), 57-65 Teacher created worksheet using Kuta software or other supplemental material.

Section 1.3 Solving Equations with Variables on Both Sides

Specific Learning Objective	Warm-Up/Starting Options	Practice & Apply Exercises
• Solve equations with variables on both sides	**Warm Up:** Have students answer Start Thinking and/or Warm Up questions from Lesson 1.3 in the Big Ideas Resources file. Review the answers as a class.	Big Ideas Text p. 23-24 #1-26 (odd only), 38, 41-44 Teacher created worksheet using Kuta software or other supplemental material.

Section 1.5 Rewriting Equations and Formulas

Specific Learning Objective	Warm-Up/Starting Options	Practice & Apply Exercises
• Rewrite literal equations • Rewrite formulas	**Warm Up:** Have students answer Start Thinking and/or Warm Up questions from Lesson 1.3 in the Big Ideas Resources file. Review the answers as a class.	Big Ideas Text p. 40-42 #1-25 (odd only), 47-54 Teacher created worksheet using Kuta software or other supplemental material.

PART IV: EVIDENCE OF LEARNING

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

Assessments		
Summative	**Formative**	**Performance**
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 Algebra 1 curriculum/syllabus at the conclusion of an instructional time period. ● Diagnostic Pre‑Test ● Chapter Tests ● Periodic Benchmarks ● Standardized Tests	The effectiveness of the instructional program will be based on numerous activities and strategies including the following and are not limited to: ● Teacher observations ● Self-Assessments ● Student record-keeping ● Quizzes ● Warm-ups ● Exit Tickets ● Participation in class discussions ● Independent practice	The following assessments require students to utilize various strands of mathematics. ● Projects ● Performance Tasks ● Homework ● Classwork

List of Accommodations and Modifications
- Special Education
- 504 Students
- At Risk Students
- MLL
- Gifted and Talented

State Mandates and Resources
● New Jersey Student Learning Standards ● Standards for Mathematical Practices

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PART I: UNIT RATIONALE

WHY ARE STUDENTS LEARNING THIS CONTENT AND THESE SKILLS?

Unit Title: Solving Linear Equations	
In this unit, students will apply the techniques used in solving linear equations to solving linear inequalities.	
Essential Questions	**Learning Targets/Objectives**
1. How can you use an inequality to describe a real life statement? 2. How can you use addition or subtraction to solve an inequality? 3. How can you use division to solve an inequality? 4. How can you solve a multi-step inequality? 5. How can you use inequalities to describe intervals on the real number line?	Students will be able to: • Write linear inequalities • Sketch the graphs of linear inequalities • Write linear inequalities from graphs • Solve one step inequalities • Solve multi-step inequalities • Write and graph compound inequalities • Solve compound inequalities • Use compound inequalities to solve real-life problems
Tier 2 Vocabulary *High-frequency words used throughout the unit*	**Tier 3 Vocabulary** *Discipline-specific words used throughout the unit*
Greater than, less than, more than	Inequalities, coefficients

PART II: INSTRUCTIONAL STRATEGIES AND RESOURCES
DESCRIBE THE LEARNING TARGETS.

New Jersey Student Learning Standards That Support Learning Targets	
2023 New Jersey Student Learning Standards for Mathematics	
1. A-CED.A.1 2. A-REI.B.3 3. A-SSE.A.1a 4. A-SSE.A.1b	1. Create equations and inequalities in one variable and use them to solve problems. Climate Change Example: Students may create equations and/or inequalities to represent the economic impact of climate change. 2. Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters. 3. Interpret parts of an expression, such as terms, factors, and coefficients. 4. Interpret complicated expressions by viewing one or more of their parts as a single entity.
NJSLS	**Interdisciplinary Connections**
1. HS-PS2-2 2. L.KL.9-10.2.A 3. SL.PE.9-10.1.D 4. SL.PI.9-10.4	1. Use mathematical representations to support the claim that the total momentum of a system of objects is conserved when there is no net force on the system 2. Acquire and use accurately general academic and domain-specific words and phrases, sufficient for reading, writing, speaking, and listening at the college and career readiness level. 3. Respond thoughtfully to various perspectives, summarize points of agreement and disagreement, and justify own views. Make new connections in light of the evidence and reasoning presented. 4. Present information, findings, and supporting evidence clearly, concisely, and logically. The content, organization, development, and style are appropriate to task, purpose, and audience.

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- Problem Solve

Reason abstractly and quantitatively: Investigate specific examples and represent them symbolically, and observe the relationships in numbers or symbols to derive conclusions about a concrete instance. Throughout the unit students are given problems that require them to:
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Videos
[One Step Inequalities](#)   [Two-Step Inequalities](#)   [Solve and Graph Linear Inequalities](#)
Integrated Technology

● Google Suite: Google Classroom, Docs, Drive, Mail, etc…
● Devices:
  ○ Chromebooks
  ○ Texas Instrument TI-84 Plus Graphing Calculator	

ML Resources	
● Multi-Language Glossary	
Gifted & Talented Resources	
● Leveled Assessments ● Enrichment worksheets	

PART III: TRANSFER OF KNOWLEDGE AND SKILLS

DESCRIBE THE LEARNING EXPERIENCE.

How will students uncover content and build skills?

Section 2.1 Writing and Graphing Inequalities		
Specific Learning Objective	**Warm-Up/Starting Options**	**Practice & Apply Exercises**
● Write linear inequalities ● Sketch the graphs of linear inequalities ● Write linear inequalities from graphs	**Warm-Up:** Have students answer Start Thinking and/or Warm-Up questions from lesson 2.1 in the Big Ideas Resources file. Review answers as a class. Review common vocabulary words needed for this section.	Big Ideas Text p. 58-60 #1-25, 29-36, 41-44, 60-67 (odd only) Teacher created worksheet using Kuta software or other supplemental material.

	Review new and familiar vocabulary.	

Section 2.2 Solving Inequalities Using Addition or Subtraction

Specific Learning Objective	Warm-Up/Starting Options	Practice & Apply Exercises
• Solve inequalities using addition • Solve inequalities using subtraction	**Warm-Up:** Have students answer Start Thinking and/or Warm-Up questions from lesson 2.2 in the Big Ideas Resources file. Review answers as a class. Review common vocabulary words needed for this section. Review new and familiar vocabulary.	Big Ideas Text p. 65-66 #1-24, 39-46 (odd only) Teacher created worksheet using Kuta software or other supplemental material.

Section 2.3 Solving Linear Inequalities Using Multiplication or Division

Specific Learning Objective	Warm-Up/Starting Options	Practice & Apply Exercises
• Solve linear inequalities using multiplication • Solve linear inequalities using division	**Warm-Up:** Have students answer Start Thinking and/or Warm-Up questions from lesson 2.3 in the Big Ideas Resources file. Review answers as a class. Review common vocabulary words needed for this section. Review new and familiar vocabulary.	Big Ideas Text p. 71-72 #1-19, 21-26, 40-47(odd only) Teacher created worksheet using Kuta software or other supplemental material.

Section 2.4 Solving Multi-Step Inequalities

Specific Learning Objective	Warm-Up/Starting Options	Practice & Apply Exercises
- Solve multi-step inequalities - Use multi-step inequalities to solve real-life problems	**Warm-Up:** Have students answer Start Thinking and/or Warm-Up questions from lesson 2.4 in the Big Ideas Resources file. Review answers as a class. Review common vocabulary words needed for this section. Review new and familiar vocabulary.	Big Ideas Text p. 77-78 #1-16, 32, 41-43 Teacher created worksheet using Kuta software or other supplemental material.

Section 2.5 Solving Compound Inequalities

Specific Learning Objective	Warm-Up/Starting Options	Practice & Apply Exercises
- Write and graph compound inequalities - Solve compound inequalities - Use compound inequalities to solve real-world problems	**Warm-Up:** Have students answer Start Thinking and/or Warm-Up questions from lesson 2.5 in the Big Ideas Resources file. Review answers as a class. Review common vocabulary words needed for this section. Review new and familiar vocabulary.	Big Ideas Text p. 85-86 #1-11, 13-18, 25-28, 35-39 (odd only) Teacher created worksheet using Kuta software or other supplemental material.

PART IV: EVIDENCE OF LEARNING

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

Assessments		
Summative	**Formative**	**Performance**
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PART I: UNIT RATIONALE

WHY ARE STUDENTS LEARNING THIS CONTENT AND THESE SKILLS?

Unit Title: Graphing Linear Functions	
In this unit, students will expand on their conceptual understanding of functions. The early part of the chapter focuses on function notation, representing functions, discrete and continuous functions, and evaluating functions. The rest of the chapter introduces two forms of linear equations– standard and slope intercept forms.	
Essential Questions	**Learning Targets/Objectives**
1. What is a function? 2. How can you determine whether a function is linear or nonlinear? 3. How can you use function notation to represent a function? 4. How can you describe the graph of the equation $Ax+By=C$? 5. How can you describe the graph of the equation $y=mx+b$? 6. How do the values of a, h, and k affect the graph of the absolute value function?	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 linear equations in standard form using intercepts • Find the slope of a line • Use the slope-intercept form of a linear equation
Tier 2 Vocabulary	**Tier 3 Vocabulary**

High-frequency words used throughout the unit	_Discipline-specific words used throughout the unit_
Function, relationship, points, lines, equation, solve	Domain, range, exponential, square root, cube root, independent variable, dependent variable, relation, intercepts, slope, rate of change

PART II: INSTRUCTIONAL STRATEGIES AND RESOURCES
DESCRIBE THE LEARNING TARGETS.

New Jersey Student Learning Standards That Support Learning Targets	
2023 New Jersey Student Learning Standards for Mathematics	
1. F-IFA.1	1. Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If f is a function and x is an element of its domain, then f(x) denotes the output of f corresponding to the input x. The graph of f is the graph of the equation y=f(x).
2. A-CED.A.2	2. Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axis with labels and scales.
3. A-REI.D.10	3. 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).
4. F-IF.B.5	4. Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes.
5. F-LE.A.1b	5. Recognize situations in which one quantity changes at a constant rate per unit interval relative to another.
6. F-IF.A.2	6. Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a contect.
7. F-IF.C.7a	7. Graph linear and quadratic functions and show intercepts, maxima, and minima. Climate Change Example: Students could graph linear functions to show the change in weather patterns over a course of years.

8. F-IF.C.9	8. Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).
9. F-IF.B.4	9. 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.
10. F-LE.B.5	10. Interpret the parameters in a linear or exponential function in terms of context.
11. A-SSE.A.1a	11. Interpret parts of an expression, such as terms, factors, and coefficients.

NJSLS	Interdisciplinary Connections
1. HS-PS2-2	1. Use mathematical representations to support the claim that the total momentum of a system of objects is conserved when there is no net force on the system
2. L.KL.9-10.2.A	2. Acquire and use accurately general academic and domain-specific words and phrases, sufficient for reading, writing, speaking, and listening at the college and career readiness level.
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1. 9.1.12.CDM.1	1. Identify the purposes, advantages, and disadvantages of debt.
2. 9.3.12.AG-PST.1	2. Apply physical science principles and engineering applications to solve problems and improve performance in AFNR power, structural and technical systems.
3. 9.2.12.CAP.5	3. Assess and modify a personal plan to support current interests and postsecondary plans.
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- Relationships
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- Evaluate Results

Resources
Textbook
Textbook: Algebra I, A Common Core Curriculum– Big Ideas Math, Big Ideas Learning LLC, 2019
Online Resources
- Desmos Activities   - Pear Assessment   - IXL   - Quizizz   - EdPuzzle   - Canva   - Khan Academy   - Inside Mathematics   - NJDOE Digital Item Library   - New Jersey Center for Teaching and Learning   - New Jersey Climate Education Hub
Videos
Graphing Lines in Slope Intercept Form
Integrated Technology
- Google Suite: Google Classroom, Docs, Drive, Mail, etc…   - Devices: - Chromebooks   - Texas Instrument TI-84 Plus Graphing Calculator
ML Resources
Multi-Language Glossary

Gifted & Talented Resources
- Leveled Assessments   - Enrichment worksheets

PART III: TRANSFER OF KNOWLEDGE AND SKILLS

DESCRIBE THE LEARNING EXPERIENCE.

How will students uncover content and build skills?

Section 3.1 Functions		
Specific Learning Objective	**Warm-Up/Starting Options**	**Practice & Apply Exercises**
- Determine whether relations are functions. - Find the domain and range of a function. - Identify the independent and dependent variables of a function.	**Warm-Up:** Have students answer Start Thinking and/or Warm-Up questions from lesson 3.1 in the Big Ideas Resources file. Review answers as a class. Review common vocabulary words needed for this section.	Big Ideas Text p. 108-110 #1-17, 19, 20, 44-51 (odd numbers only)

Section 3.2 Linear Functions

Specific Learning Objective	Warm-Up/Starting Options	Practice & Apply Exercises
- Identify linear functions using graphs, tables, and equations. - Graph linear functions using discrete and continuous data - Write real life problems to fit data	**Warm-Up:** Have students answer Start Thinking and/or Warm-Up questions from lesson 3.2 in the Big Ideas Resources file. Review answers as a class. Review common vocabulary words needed for this section.	Big Ideas Text p. 117-120 #1-15, 17-25, 27, 28, 55-61 (odd numbers only)

Section 3.3 Function Notation

Specific Learning Objective	Warm-Up/Starting Options	Practice & Apply Exercises
- Use function notation to evaluate and interpret functions - Use function notation to solve and graph functions	**Warm-Up:** Have students answer Start Thinking and/or Warm-Up questions from lesson 3.3 in the Big Ideas Resources file. Review answers as a class. Review common vocabulary words needed for this section.	Big Ideas Text p. 125-126 #1-10, 13-16, 21, 22, 37-42 (odd numbers only)

Section 3.4 Graphing Linear Equations in Standard Form

Specific Learning Objective	Warm-Up/Starting Options	Practice & Apply Exercises
• Graph linear equations in standard form using intercepts	**Warm-Up:** Have students answer Start Thinking and/or Warm-Up questions from lesson 3.4 in the Big Ideas Resources file. Review answers as a class. Review common vocabulary words needed for this section.	Big Ideas Text p. 133-134 #1-20, 25, 26, 29-32, 39-42 (odd numbers only) Teacher created worksheet using Kuta software or other supplemental material.

Section 3.5 Graphing Linear Equations in Slope-Intercept Form

Specific Learning Objective	Warm-Up/Starting Options	Practice & Apply Exercises
• Find the slope of a line • Use the slope-intercept form of a linear equation	**Warm-Up:** Have students answer Start Thinking and/or Warm-Up questions from lesson 3.5 in the Big Ideas Resources file. Review answers as a class. Review common vocabulary words needed for this section.	Big Ideas Text p. 141-144 #1-22, 25-28, 54-60 (odd numbers only) Teacher created worksheet using Kuta software or other supplemental material.

PART IV: EVIDENCE OF LEARNING

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

Assessments		
Summative	**Formative**	**Performance**
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 Algebra 1 curriculum/syllabus at the conclusion of an instructional time period. ● Diagnostic Pre-Test ● Chapter Tests ● Periodic Benchmarks ● Standardized Tests	The effectiveness of the instructional program will be based on numerous activities and strategies including the following and are not limited to: ● Teacher observations ● Self-Assessments ● Student record-keeping ● Quizzes ● Warm-ups ● Exit Tickets ● Participation in class discussions ● Independent practice	The following assessments require students to utilize various strands of mathematics. ● Projects ● Performance Tasks ● Homework ● Classwork

List of Accommodations and Modifications
- Special Education
- 504 Students
- At Risk Students
- MLL
- Gifted and Talented

State Mandates and Resources
● New Jersey Student Learning Standards ● Standards for Mathematical Practices

Black Horse Pike Regional School District
Where inspiring excellence is our standard, and student achievement is the result.

ML Algebra 1
Course Number: 033800

Updated: June 2024

PART I: UNIT RATIONALE

WHY ARE STUDENTS LEARNING THIS CONTENT AND THESE SKILLS?

Unit Title: Writing Linear Functions	
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.	
Essential Questions	**Learning Targets/Objectives**
1. Given the graph of a linear function, how can you write an equation of the line? 2. How can you write the equation of a line when you are given the slope and a point on the line? 3. How can you recognize lines that are parallel or perpendicular?	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 • Rewrite equations in two variables in Standard Form
Tier 2 Vocabulary *High-frequency words used throughout the unit*	**Tier 3 Vocabulary** *Discipline-specific words used throughout the unit*
Slope, intercept, function, rate, line, function, graph, opposite	slope -intercept form, point slope form, reciprocal, perpendicular lines,

	parallel lines, standard form

PART II: INSTRUCTIONAL STRATEGIES AND RESOURCES
DESCRIBE THE LEARNING TARGETS.

New Jersey Student Learning Standards That Support Learning Targets	
2023 New Jersey Student Learning Standards for Mathematics	
1. A-CED.A.2	1. Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales. Climate Change Example: Students could graph linear functions to show the change in weather patterns over a course of years.
2. F-BFA.1a	2. Determine an explicit expression, a recursive process, or steps for calculation from a context.
3. F-LE.A.1b	3. Recognize situations in which one quantity changes at a constant rate per unit interval relative to another.
4. F.LE.A.2	4. Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (including reading these from a table).
NJSLS	**Interdisciplinary Connections**
1. L.KL.9-10.2.A	1. Acquire and use accurately general academic and domain-specific words and phrases, sufficient for reading, writing, speaking, and listening at the college and career readiness level.
2. SL.PE.9-10.1.D	2. Respond thoughtfully to various perspectives, summarize points of agreement and disagreement, and justify own views. Make new connections in light of the evidence and reasoning presented.
3. SL.PI.9-10.4	3. Present information, findings, and supporting evidence clearly, concisely, and logically. The content, organization, development, and style are appropriate to task, purpose, and audience.

2020 New Jersey Student Learning Standards for Career Readiness, Life Literacies, and Key Skills	
1. 9.2.12.CAP.5	1. Assess and modify a personal plan to support current interests and postsecondary plans.
2. 9.4.12.CI.1	2. Demonstrate the ability to reflect, analyze, and use creative skills and ideas.
3. 9.4.5.DC.4	3. Model safe, legal, and ethical behavior when using online or offline technology
4. 9.4.12.CT.2	4. Explain the potential benefits of collaborating to enhance critical thinking and problem-solving.
2020 New Jersey Student Learning Standards for Computer Science and Design Thinking	
1. 8.1.2.AP.4	1. Break down a task into a sequence of steps.

The 8 Mathematical Practices are embedded throughout the course and are evident in daily lessons, assignments, activities, assessments, and projects:
Make sense of problems and persevere in solving them: Take time to analyze the given information and what the problem is asking to help you to plan a solution pathway. Throughout the unit students are given problems that require them to: ● Explain the Meaning ● Find Entry Points ● Analyze Givens ● Interpret a Solution ● Make a Plan ● Consider Similar Problems ● Check Progress ● Consider Simpler Forms ● Problem Solve

Reason abstractly and quantitatively: Investigate specific examples and represent them symbolically, and observe the relationships in numbers or symbols to derive conclusions about a concrete instance. Throughout the unit students are given problems that require them to:
- Make Sense of Quantities
- Use Equations
- Use Expressions
- Understand Quantities
- Use Operations
- Contextualize
- Relationships
- Reason Abstractly

Construct viable arguments and critique the reasoning of others: Make and justify conclusions and decide whether others' arguments are correct or flawed. Throughout the unit students are given problems that require them to:
- Use Assumptions
- Use Defi nitions
- Use Prior Results
- Make Conjectures
- Build Arguments
- Analyze Conjectures
- Use Counterexamples
- Justify Conclusions
- Compare Arguments
- Construct Arguments
- Listen and Ask Questions
- Critique Reasoning
- Use Logic
- Error Analysis

Model with mathematics: Apply the mathematics to a real-life problem, and you interpret mathematical results in the context of the situation. Throughout the unit students are given problems that require them to:
- Apply Mathematics
- Simplify a Solution
- Use a Diagram
- Use a Table
- Use a Graph

- Use a Formula
- Analyze Relationships
- Interpret Results
- Model Real Life

Use appropriate tools strategically: Know what tools are available and think about how each tool might help solve a mathematical problem. Use a tool for its advantages, while being aware of its limitations. Throughout the unit students are given problems that require them to:
- Choose Tools
- Recognize Usefulness of Tools
- Use Other Resources
- Use Technology to Explore

Attend to precision: Develop a habit of being careful how you talk about concepts, label your work, and write your answers. Throughout the unit students are given problems that require them to:
- Communicate Precisely
- Use Clear Definitions
- State the Meaning of Symbols
- Specify Units
- Label Axes
- Calculate Accurately
- Understand Mathematical Terms

Look for and make use of structure: Look closely to see structure within a mathematical statement, or step back for an overview to see how individual parts make one single object. Throughout the unit students are given problems that require them to:
- View as Components
- Look for Patterns
- Look for Structure

Look for and express regularity in repeated reasoning: Notice patterns and make generalizations. Keeping in mind the goal of a problem helps you evaluate reasonableness of answers along the way. Throughout the unit students are given problems that require them to:
- Repeat Calculations
- Find General Methods
- Maintain Oversight
- Evaluate Results

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- Google Suite: Google Classroom, Docs, Drive, Mail, etc…   - Devices: - Chromebooks   - Texas Instrument TI-84 Plus Graphing Calculator
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- Leveled Assessments   - Enrichment worksheets

PART III: TRANSFER OF KNOWLEDGE AND SKILLS

DESCRIBE THE LEARNING EXPERIENCE.

How will students uncover content and build skills?

Section 4.1 Writing Equations in Slope-Intercept Form		
Specific Learning Objective	**Warm-Up/Starting Options**	**Practice & Apply Exercises**
- Write equations in slope-intercept form. - Use linear equations to solve real-life problems.	**Warm-Up:** Have students answer Start Thinking and/or Warm-Up questions from lesson 4.1 in the Big Ideas Resources file. Review answers as a class. Review common vocabulary words needed for this section.	Big Ideas Text p. 179-180 #1-18, 27, 28, 38-45 (odd numbers only) Teacher created worksheet using Kuta software or other supplemental material.

Section 4.2 Writing Equations in Point-Slope Form

Specific Learning Objective	Warm-Up/Starting Options	Practice & Apply Exercises
• 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	**Warm-Up:** Have students answer Start Thinking and/or Warm-Up questions from lesson 4.2 in the Big Ideas Resources file. Review answers as a class. Review common vocabulary words needed for this section.	Big Ideas Text p. 185-186 #1-8, 11-20, 41-44 (odd numbers only) Teacher created worksheet using Kuta software or other supplemental material.

Supplemental Section- Writing Equations in Standard Form

Specific Learning Objective	Warm-Up/Starting Options	Practice & Apply Exercises
• Rewrite equations in two variables in Standard Form	**Warm-Up:** Review common vocabulary words needed for this section.	Teacher created worksheet using Kuta software or other supplemental material.

Section 4.3 Writing Equations of Parallel and Perpendicular Lines

Specific Learning Objective	Warm-Up/Starting Options	Practice & Apply Exercises
• 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	**Warm-Up:** Have students answer Start Thinking and/or Warm-Up questions from lesson 4.3 in the Big Ideas Resources file. Review answers as a class. Review common vocabulary words needed for this section.	Big Ideas Text p. 191-192 #1-6, 9, 10, 13-16, 19, 20, 25, 26, 37, 38 (odd numbers only) Teacher created worksheet using Kuta software or other supplemental material.

PART IV: EVIDENCE OF LEARNING
IDENTIFY THE METHODS BY WHICH STUDENTS WILL DEMONSTRATE THEIR UNDERSTANDING OF CONTENT AND THEIR ABILITY TO APPLY SKILLS.

Assessments		
Summative	**Formative**	**Performance**
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 Algebra 1 curriculum/syllabus at the conclusion of an instructional time period. ● Diagnostic Pre-Test ● Chapter Tests ● Periodic Benchmarks ● Standardized Tests	The effectiveness of the instructional program will be based on numerous activities and strategies including the following and are not limited to: ● Teacher observations ● Self-Assessments ● Student record-keeping ● Quizzes ● Warm-ups ● Exit Tickets ● Participation in class discussions ● Independent practice	The following assessments require students to utilize various strands of mathematics. ● Projects ● Performance Tasks ● Homework ● Classwork

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PART I: UNIT RATIONALE

<u>WHY</u> ARE STUDENTS LEARNING THIS CONTENT AND THESE SKILLS?

Unit Title: Solving Systems of Linear Equations
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 section combines prior skills with new knowledge to allow students to graph systems of linear inequalities.

Essential Questions	Learning Targets/Objectives
1. How can you solve a system of linear equations? 2. How can you use substitution to solve a system of linear equations? 3. How can you use elimination to solve a system of linear equations? 4. Can a system of linear equations have no solution or infinitely many solutions? 5. How can you graph a linear inequality in two variables? 6. How can you graph a system of linear inequalities?	Students will be able to: • Check solutions of systems of linear equations • Solve systems of linear equations by graphing • Use 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 system of linear inequalities • Graph systems of linear inequalities

	• Use systems of linear inequalities to solve real life problems
Tier 2 Vocabulary *High-frequency words used throughout the unit*	**Tier 3 Vocabulary** *Discipline-specific words used throughout the unit*
Point, ordered pair, linear, variable, graph, solution	System of linear equations, solution of a system, graph of a linear inequality

PART II: INSTRUCTIONAL STRATEGIES AND RESOURCES
DESCRIBE THE LEARNING TARGETS.

New Jersey Student Learning Standards That Support Learning Targets	
2023 New Jersey Student Learning Standards for Mathematics	
1. A-CED.A.3	1. 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. Climate Change Example: Students may represent constraints describing the economic impact of climate change by equations, inequalities, and/or by systems of inequalities, and interpret solutions as viable or nonviable options.
2. A-REI.C.5	2. 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.
3. A-REI.C.6	3. Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.
4. A-REI.D.11	4. 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
5. A-REI.D.12	5. 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 a graph the solution set to a system of linear inequalities in two variables as the intersection

NJSLS	Interdisciplinary Connections
of the corresponding half-planes.	
NJSLS	**Interdisciplinary Connections**
1. L.KL.9-10.2.A	1. Acquire and use accurately general academic and domain-specific words and phrases, sufficient for reading, writing, speaking, and listening at the college and career readiness level.
2. SL.PE.9-10.1.D	2. Respond thoughtfully to various perspectives, summarize points of agreement and disagreement, and justify own views. Make new connections in light of the evidence and reasoning presented.
3. SL.PI.9-10.4	3. Present information, findings, and supporting evidence clearly, concisely, and logically. The content, organization, development, and style are appropriate to task, purpose, and audience.
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2. 9.4.12.CI.1	2. Demonstrate the ability to reflect, analyze, and use creative skills and ideas.
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The 8 Mathematical Practices are embedded throughout the course and are evident in daily lessons, assignments, activities, assessments, and projects:

Make sense of problems and persevere in solving them: Take time to analyze the given information and what the problem is asking to help you to plan a solution pathway. Throughout the unit students are given problems that require them to:
- Explain the Meaning
- Find Entry Points
- Analyze Givens
- Interpret a Solution
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- Problem Solve

Reason abstractly and quantitatively: Investigate specific examples and represent them symbolically, and observe the relationships in numbers or symbols to derive conclusions about a concrete instance. Throughout the unit students are given problems that require them to:
- Make Sense of Quantities
- Use Equations
- Use Expressions
- Understand Quantities
- Use Operations
- Contextualize
- Relationships
- Reason Abstractly

Construct viable arguments and critique the reasoning of others: Make and justify conclusions and decide whether others' arguments are correct or flawed. Throughout the unit students are given problems that require them to:
- Use Assumptions
- Use Defi nitions
- Use Prior Results
- Make Conjectures
- Build Arguments
- Analyze Conjectures
- Use Counterexamples

- Justify Conclusions
- Compare Arguments
- Construct Arguments
- Listen and Ask Questions
- Critique Reasoning
- Use Logic
- Error Analysis

Model with mathematics: Apply the mathematics to a real-life problem, and you interpret mathematical results in the context of the situation. Throughout the unit students are given problems that require them to:
- Apply Mathematics
- Simplify a Solution
- Use a Diagram
- Use a Table
- Use a Graph
- Use a Formula
- Analyze Relationships
- Interpret Results
- Model Real Life

Use appropriate tools strategically: Know what tools are available and think about how each tool might help solve a mathematical problem. Use a tool for its advantages, while being aware of its limitations. Throughout the unit students are given problems that require them to:
- Choose Tools
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Attend to precision: Develop a habit of being careful how you talk about concepts, label your work, and write your answers. Throughout the unit students are given problems that require them to:
- Communicate Precisely
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- State the Meaning of Symbols
- Specify Units
- Label Axes
- Calculate Accurately
- Understand Mathematical Terms

Look for and make use of structure: Look closely to see structure within a mathematical statement, or step back for an overview to see how individual parts make one single object. Throughout the unit students are given problems that require them to:
- View as Components
- Look for Patterns
- Look for Structure

Look for and express regularity in repeated reasoning: Notice patterns and make generalizations. Keeping in mind the goal of a problem helps you evaluate reasonableness of answers along the way. Throughout the unit students are given problems that require them to:
- Repeat Calculations
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PART III: TRANSFER OF KNOWLEDGE AND SKILLS

DESCRIBE THE LEARNING EXPERIENCE.

<u>How </u>will students uncover content and build skills?

Section 5.1 Solving Systems of Linear Equations		
Specific Learning Objective	**Warm-Up/Starting Options**	**Practice & Apply Exercises**
- Check solutions of systems of linear equations - Solve systems of linear equations by graphing	**Warm-Up:** Have students answer Start Thinking and/or Warm-Up questions from lesson 5.1 in the Big Ideas Resources file. Review answers as a class. Review common vocabulary words needed for this section.	

Section 5.2 Solving Systems of Linear Equations by Substitution

Specific Learning Objective	Warm-Up/Starting Options	Practice & Apply Exercises
• Use systems of linear equations by substitution •	**Warm-Up:** Have students answer Start Thinking and/or Warm-Up questions from lesson 5.2 in the Big Ideas Resources file. Review answers as a class. Review common vocabulary words needed for this section.	

Section 5.3 Solving Systems of Linear Equations by Elimination

Specific Learning Objective	Warm-Up/Starting Options	Practice & Apply Exercises
• Solve systems of linear equations by elimination	**Warm-Up:** Have students answer Start Thinking and/or Warm-Up questions from lesson 5.3 in the Big Ideas Resources file. Review answers as a class. Review common vocabulary words needed for this section.	

Section 5.4 Solving Special Systems of Linear Equations

Specific Learning Objective	Warm-Up/Starting Options	Practice & Apply Exercises
• Determine the number of solutions of linear systems • Use linear systems to solve real-life problems	**Warm-Up:** Have students answer Start Thinking and/or Warm-Up questions from lesson 5.4 in the Big Ideas Resources file. Review answers as a class. Review common vocabulary words needed for this section.	

Section 5.5 Solving Equations by Graphing

Specific Learning Objective	Warm-Up/Starting Options	Practice & Apply Exercises
• Solve linear equations by graphing	**Warm-Up:** Have students answer Start Thinking and/or Warm-Up questions from lesson 5.5 in the Big Ideas Resources file. Review answers as a class. Review common vocabulary words needed for this section.	

Section 5.6 Graphing Linear Inequalities in Two Variables

Specific Learning Objective	Warm-Up/Starting Options	Practice & Apply Exercises
• Check solutions of linear inequalities • Graph linear inequalities in two variables • Use linear inequalities to solve real life problems	**Warm-Up:** Have students answer Start Thinking and/or Warm-Up questions from lesson 5.6 in the Big Ideas Resources file. Review answers as a class. Review common vocabulary words needed for this section.	

Section 5.7 Systems of Linear Inequalities		
Specific Learning Objective	**Warm-Up/Starting Options**	**Practice & Apply Exercises**
• Check solutions of system of linear inequalities • Graph systems of linear inequalities • Use systems of linear inequalities to solve real life problems	**Warm-Up:** Have students answer Start Thinking and/or Warm-Up questions from lesson 5.7 in the Big Ideas Resources file. Review answers as a class. Review common vocabulary words needed for this section.	

PART IV: EVIDENCE OF LEARNING

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

Assessments		
Summative	**Formative**	**Performance**
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 Algebra 1 curriculum/syllabus at the conclusion of an instructional time period. • Diagnostic Pre-Test	The effectiveness of the instructional program will be based on numerous activities and strategies including the following and are not limited to: • Teacher observations • Self-Assessments • Student record-keeping • Quizzes • Warm-ups	The following assessments require students to utilize various strands of mathematics. • Projects • Performance Tasks • Homework • Classwork

● Chapter Tests ● Periodic Benchmarks ● Standardized Tests	● Exit Tickets ● Participation in class discussions ● Independent practice	

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PART I: UNIT RATIONALE

WHY ARE STUDENTS LEARNING THIS CONTENT AND THESE SKILLS?

Unit Title: Exponential Functions and Sequences	
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.	
Essential Questions	**Learning Targets/Objectives**
1. How can you write general rules involving properties of exponents? 2. What are some of the characteristics of the graph of an exponential function? 3. What are some of the characteristics of exponential growth and exponential decay functions?	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
Tier 2 Vocabulary *High-frequency words used throughout the unit*	**Tier 3 Vocabulary** *Discipline-specific words used throughout the unit*

Fraction, square root, function, base, growth, decay	Exponents, power, base, scientific notation, radical, index (of a radical), exponential function, parent function, transformation, exponential growth, exponential decay, compound interest, interest, exponential equation

PART II: INSTRUCTIONAL STRATEGIES AND RESOURCES
DESCRIBE THE LEARNING TARGETS.

New Jersey Student Learning Standards That Support Learning Targets	
2023 New Jersey Student Learning Standards for Mathematics	
1. N-RN.A.2	1. Rewrite expressions involving radicals and rational exponents using the properties of exponents.
2. A-CED.A.2	2. Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.
3. F-IF.B.4	3. For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch the graphs showing key features given a verbal description of the relationship. Climate Change Example: Students may relate the domain of a function $c(m)$ representing the amount of carbon dioxide produced by burning m molecules of ethane (gasoline), to its graph in order to determine the appropriate domain for $c(m)$.
4. F-IF.C.7e	4. Graph exponential and logarithmic functions, showing intercepts and end behavior.
5. F-IF.C.9	5. Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).
6. F-LE.A.1c	6. Recognize situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another.
7. F-LE.A.2	7. 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).

NJSLS	Interdisciplinary Connections
1. L.KL.9-10.2.A	1. Acquire and use accurately general academic and domain-specific words and phrases, sufficient for reading, writing, speaking, and listening at the college and career readiness level.
2. SL.PE.9-10.1.D	2. Respond thoughtfully to various perspectives, summarize points of agreement and disagreement, and justify own views. Make new connections in light of the evidence and reasoning presented.
3. SL.PI.9-10.4	3. Present information, findings, and supporting evidence clearly, concisely, and logically. The content, organization, development, and style are appropriate to task, purpose, and audience.
4. HS-LS2-1	4. Use mathematical and/or computational representations to support explanations of factors that affect carrying capacity of ecosystems at different scales.

2020 New Jersey Student Learning Standards for Career Readiness, Life Literacies, and Key Skills	
1. 9.2.12.CAP.5	1. Assess and modify a personal plan to support current interests and postsecondary plans.
2. 9.4.12.CI.1	2. Demonstrate the ability to reflect, analyze, and use creative skills and ideas.
3. 9.4.5.DC.4	3. Model safe, legal, and ethical behavior when using online or offline technology
4. 9.4.12.CT.2	4. Explain the potential benefits of collaborating to enhance critical thinking and problem-solving.

2020 New Jersey Student Learning Standards for Computer Science and Design Thinking	
1. 8.1.2.AP.4	1. Break down a task into a sequence of steps.

The 8 Mathematical Practices are embedded throughout the course and are evident in daily lessons, assignments, activities, assessments, and projects:

Make sense of problems and persevere in solving them: Take time to analyze the given information and what the problem is asking to help you to plan a solution pathway. Throughout the unit students are given problems that require them to:
- Explain the Meaning
- Find Entry Points
- Analyze Givens
- Interpret a Solution
- Make a Plan
- Consider Similar Problems
- Check Progress
- Consider Simpler Forms
- Problem Solve

Reason abstractly and quantitatively: Investigate specific examples and represent them symbolically, and observe the relationships in numbers or symbols to derive conclusions about a concrete instance. Throughout the unit students are given problems that require them to:
- Make Sense of Quantities
- Use Equations
- Use Expressions
- Understand Quantities
- Use Operations
- Contextualize
- Relationships
- Reason Abstractly

Construct viable arguments and critique the reasoning of others: Make and justify conclusions and decide whether others' arguments are correct or flawed. Throughout the unit students are given problems that require them to:
- Use Assumptions
- Use Defi nitions
- Use Prior Results
- Make Conjectures
- Build Arguments
- Analyze Conjectures
- Use Counterexamples

- Justify Conclusions
- Compare Arguments
- Construct Arguments
- Listen and Ask Questions
- Critique Reasoning
- Use Logic
- Error Analysis

Model with mathematics: Apply the mathematics to a real-life problem, and you interpret mathematical results in the context of the situation. Throughout the unit students are given problems that require them to:
- Apply Mathematics
- Simplify a Solution
- Use a Diagram
- Use a Table
- Use a Graph
- Use a Formula
- Analyze Relationships
- Interpret Results
- Model Real Life

Use appropriate tools strategically: Know what tools are available and think about how each tool might help solve a mathematical problem. Use a tool for its advantages, while being aware of its limitations. Throughout the unit students are given problems that require them to:
- Choose Tools
- Recognize Usefulness of Tools
- Use Other Resources
- Use Technology to Explore

Attend to precision: Develop a habit of being careful how you talk about concepts, label your work, and write your answers. Throughout the unit students are given problems that require them to:
- Communicate Precisely
- Use Clear Definitions
- State the Meaning of Symbols
- Specify Units
- Label Axes
- Calculate Accurately
- Understand Mathematical Terms

Look for and make use of structure: Look closely to see structure within a mathematical statement, or step back for an overview to see how individual parts make one single object. Throughout the unit students are given problems that require them to:
- View as Components
- Look for Patterns
- Look for Structure

Look for and express regularity in repeated reasoning: Notice patterns and make generalizations. Keeping in mind the goal of a problem helps you evaluate reasonableness of answers along the way. Throughout the unit students are given problems that require them to:
- Repeat Calculations
- Find General Methods
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PART III: TRANSFER OF KNOWLEDGE AND SKILLS

DESCRIBE THE LEARNING EXPERIENCE.

How will students uncover content and build skills?

Section 6.1 Properties of Exponents		
Specific Learning Objective	**Warm-Up/Starting Options**	**Practice & Apply Exercises**
• Use zero and negative exponents • Use the properties of exponents • Solve real-life problems involving exponents	**Warm-Up:** Have students answer Start Thinking and/or Warm-Up questions from lesson 6.1 in the Big Ideas Resources file. Review answers as a class. Review common vocabulary words needed for this section.	Big Ideas Text p. 296-298 #1-32, 35, 36, 70-75 (odd numbers only) Teacher created worksheet using Kuta software or other supplemental material.

Section 6.3 Exponential Functions

Specific Learning Objective	Warm-Up/Starting Options	Practice & Apply Exercises
- Identify and evaluate exponential functions - Graph exponential functions - Solve real-life problems involving exponential functions	**Warm-Up:** Have students answer Start Thinking and/or Warm-Up questions from lesson 6.2 in the Big Ideas Resources file. Review answers as a class. Review common vocabulary words needed for this section.	Big Ideas Text p. 310-312 #1-24, 64-67(odd numbers only) Teacher created worksheet using Kuta software or other supplemental material.

Section 6.4 Exponential Growth and Decay

Specific Learning Objective	Warm-Up/Starting Options	Practice & Apply Exercises
- 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	**Warm-Up:** Have students answer Start Thinking and/or Warm-Up questions from lesson 6.4 in the Big Ideas Resources file. Review answers as a class. Review common vocabulary words needed for this section.	Big Ideas Text p. 319-322 #1-17, 19-30, 33-38, 73-79 (odd numbers only) Teacher created worksheet using Kuta software or other supplemental material.

PART IV: EVIDENCE OF LEARNING
IDENTIFY THE METHODS BY WHICH STUDENTS WILL DEMONSTRATE THEIR UNDERSTANDING OF CONTENT AND THEIR ABILITY TO APPLY SKILLS.

Assessments		
Summative	**Formative**	**Performance**
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 Algebra 1 curriculum/syllabus at the conclusion of an instructional time period. ● Diagnostic Pre-Test ● Chapter Tests ● Periodic Benchmarks ● Standardized Tests	The effectiveness of the instructional program will be based on numerous activities and strategies including the following and are not limited to: ● Teacher observations ● Self-Assessments ● Student record-keeping ● Quizzes ● Warm-ups ● Exit Tickets ● Participation in class discussions ● Independent practice	The following assessments require students to utilize various strands of mathematics. ● Projects ● Performance Tasks ● Homework ● Classwork

List of Accommodations and Modifications
- Special Education
- 504 Students
- At Risk Students
- MLL
- Gifted and Talented

State Mandates and Resources

- New Jersey Student Learning Standards
- Standards for Mathematical Practices

Black Horse Pike Regional School District
Where inspiring excellence is our standard, and student achievement is the result.

ML Algebra 1
Course Number: 033800

Updated: June 2024

PART I: UNIT RATIONALE

WHY ARE STUDENTS LEARNING THIS CONTENT AND THESE SKILLS?

Unit Title: Polynomial Equations and Factoring
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.

Essential Questions	Learning Targets/Objectives
1. How do I add, subtract, and multiply polynomials? 2. How do I factor polynomials? 3. How do I write and solve polynomial equations to solve problems?	Students will be able to: • Add and subtract polynomials • Multiply polynomials • Use the square of a binomial pattern • Use the sum and difference pattern • Use the Zero Product Property • Solve polynomial equations by factoring • Factor x^2+bx+c • Factor ax^2+bx+c • Factor special products • Factor polynomials completely

Tier 2 Vocabulary *High-frequency words used throughout the unit*	Tier 3 Vocabulary *Discipline-specific words used throughout the unit*
Term, divide, exponent	Monomial, binomial, trinomial, polynomial, degree of a monomial, degree of a polynomial, standard form, factor, coefficient, leading coefficient

PART II: INSTRUCTIONAL STRATEGIES AND RESOURCES
DESCRIBE THE LEARNING TARGETS.

New Jersey Student Learning Standards That Support Learning Targets	
2023 New Jersey Student Learning Standards for Mathematics	
1. A.APR.A.1	1. Understand that polynomials form a system analogous to the integers namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials Climate Change Example: Students may create equations and/or inequalities to represent the economic impact of climate change.
2. A-APR.B.3	2. Identify zeros of polynomials when suitable factorizations are available, and use the zeros to construct a rough graph of the function defined by the polynomial.
3. A.CED.A.1	3. 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.
4. A.REI.B.4b	4. 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 gies complex solutions and write them as a+/-bi for real numbers a and b.
5. A-SSE.A.1a	5. Interpret parts of an expression, such as terms, factors, and coefficients.
6. A-SSE.A.2	6. Use the structure of an expression to identify ways to rewrite it

7. A.SSE.B.3.a	7. 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.
NJSLS	**Interdisciplinary Connections**
1. L.KL.9-10.2.A	1. Acquire and use accurately general academic and domain-specific words and phrases, sufficient for reading, writing, speaking, and listening at the college and career readiness level.
2. SL.PE.9-10.1.D	2. Respond thoughtfully to various perspectives, summarize points of agreement and disagreement, and justify own views. Make new connections in light of the evidence and reasoning presented.
3. SL.PI.9-10.4	3. Present information, findings, and supporting evidence clearly, concisely, and logically. The content, organization, development, and style are appropriate to task, purpose, and audience.

2020 New Jersey Student Learning Standards for Career Readiness, Life Literacies, and Key Skills	
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- Specify Units
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Videos

- [Factoring a Greatest Common Factor from a Trinomial](#)
- [Adding Polynomials](#)

Integrated Technology

- Google Suite: Google Classroom, Docs, Drive, Mail, etc…
- Devices:
    - Chromebooks
    - Texas Instrument TI-84 Plus Graphing Calculator

ML Resources

- Multi-Language Glossary

Gifted & Talented Resources

- Leveled Assessments
- Enrichment worksheets

PART III: TRANSFER OF KNOWLEDGE AND SKILLS

DESCRIBE THE LEARNING EXPERIENCE.

How will students uncover content and build skills?

Section 7.1 Adding and Subtracting Polynomials		
Specific Learning Objective	**Warm-Up/Starting Options**	**Practice & Apply Exercises**
• Add and subtract polynomials	**Warm-Up:** Have students answer Start Thinking and/or Warm-Up questions from lesson 7.1 in the Big Ideas Resources file. Review answers as a class. Review common vocabulary words needed for this section.	Big Ideas Text p. 362 #1-4, 6-18 even, 22- 46 even, 53-57, 62-64 Teacher created worksheet using Kuta software or other supplemental material.

Section 7.2 Multiplying Polynomials		
Specific Learning Objective	**Warm-Up/Starting Options**	**Practice & Apply Exercises**
• Multiply polynomials	**Warm-Up:** Have students answer Start Thinking and/or Warm-Up questions from lesson 7.2 in the Big Ideas Resources file. Review answers as a class. Review common vocabulary words needed for this section.	Big Ideas Text p. 369 # 1, 4-24 even, 28-30 even, 44, 52-58 Teacher created worksheet using Kuta software or other supplemental material.

Section 7.3 Special Products of Polynomials

Specific Learning Objective	Warm-Up/Starting Options	Practice & Apply Exercises
• Use the square of a binomial pattern • Use the sum and difference pattern	**Warm-Up:** Have students answer Start Thinking and/or Warm-Up questions from lesson 7.3 in the Big Ideas Resources file. Review answers as a class. Review common vocabulary words needed for this section.	Big Ideas Text p. 375 #1, 4-10 even, 16, 18, 22, 34, 37, 48-51 Teacher created worksheet using Kuta software or other supplemental material.

Section 7.4 Solving Polynomial Equations in Factored Form

Specific Learning Objective	Warm-Up/Starting Options	Practice & Apply Exercises
• Use the Zero Product Property • Solve polynomial equations by factoring	**Warm-Up:** Have students answer Start Thinking and/or Warm-Up questions from lesson 7.4 in the Big Ideas Resources file. Review answers as a class. Review common vocabulary words needed for this section.	Big Ideas Text p. 381 #1, 2-16 even, 22-38 even, 41, 42, 44, 49-52 Teacher created worksheet using Kuta software or other supplemental material.

Section 7.5 Factoring x^2+bx+c

Specific Learning Objective	Warm-Up/Starting Options	Practice & Apply Exercises
• Factor x^2+bx+c	**Warm-Up:** Have students answer Start Thinking and/or Warm-Up questions from lesson 7.5 in the Big Ideas Resources file. Review answers as a class. Review common vocabulary words needed for this section.	Big Ideas Text p. 389 #1, 2-38 even, 39, 46, 47 - 55 Teacher created worksheet using Kuta software or other supplemental material.

Section 7.6 ax^2+bx+c

Specific Learning Objective	Warm-Up/Starting Options	Practice & Apply Exercises
• Factor ax^2+bx+c	**Warm-Up:** Have students answer Start Thinking and/or Warm-Up questions from lesson 7.6 in the Big Ideas Resources file. Review answers as a class. Review common vocabulary words needed for this section.	Big Ideas Text p. 395 #1, 2-34 even, 38, 45-56 Teacher created worksheet using Kuta software or other supplemental material.

Section 7.7 Factoring Special Products

Specific Learning Objective	Warm-Up/Starting Options	Practice & Apply Exercises
• Factor special products	**Warm-Up:** Have students answer Start Thinking and/or Warm-Up questions from lesson 7.7 in the Big Ideas Resources file. Review answers as a class. Review common vocabulary words needed for this section.	Big Ideas Text p. 401 #1, 2-8 even, 16-32 even, 36-42 even, 46, 47, 49-56 Teacher created worksheet using Kuta software or other supplemental material.

Section 7.8 Factoring Polynomials Completely

Specific Learning Objective	Warm-Up/Starting Options	Practice & Apply Exercises
• Factor polynomials completely	**Warm-Up:** Have students answer Start Thinking and/or Warm-Up questions from lesson 7.8 in the Big Ideas Resources file.	Big Ideas Text p. 407 #1, 2-34 even, 38, 40, 42, 50-57

	Review answers as a class. Review common vocabulary words needed for this section.	Teacher created worksheet using Kuta software or other supplemental material.

PART IV: EVIDENCE OF LEARNING

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

Assessments		
Summative	**Formative**	**Performance**
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 Algebra 1 curriculum/syllabus at the conclusion of an instructional time period. ● Diagnostic Pre‑Test ● Chapter Tests ● Periodic Benchmarks ● Standardized Tests	The effectiveness of the instructional program will be based on numerous activities and strategies including the following and are not limited to: ● Teacher observations ● Self-Assessments ● Student record-keeping ● Quizzes ● Warm-ups ● Exit Tickets ● Participation in class discussions ● Independent practice	The following assessments require students to utilize various strands of mathematics. ● Projects ● Performance Tasks ● Homework ● Classwork
List of Accommodations and Modifications ● Special Education ● 504 Students ● At Risk Students ● MLL ● Gifted and Talented		

State Mandates and Resources
[New Jersey Student Learning Standards](#)   [Standards for Mathematical Practices](#)

Black Horse Pike Regional School District
Where inspiring excellence is our standard, and student achievement is the result.

ML Algebra 1
Course Number: 033800

Updated: June 2024

PART I: UNIT RATIONALE

WHY ARE STUDENTS LEARNING THIS CONTENT AND THESE SKILLS?

Unit Title: Graphing Quadratic Functions	
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, and using the quadratic formula.	
Essential Questions	**Learning Targets/Objectives**
1. How do I graph quadratic functions? 2. How do I compare linear, exponential, and quadratic models?	Students will be able to: • Identify characteristics of quadratic functions • 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
Tier 2 Vocabulary *High-frequency words used throughout the unit*	**Tier 3 Vocabulary** *Discipline-specific words used throughout the unit*
Point, reflection, translation, zero, shrink, stretch, intercept, independent variable, dependent variable, average rate of change	Quadratic function, parabola, vertex, axis of symmetry, vertical shrink, vertical stretch, zero of a function, maximum value, minimum value, even function, odd function, vertex form, intercept form

PART II: INSTRUCTIONAL STRATEGIES AND RESOURCES
DESCRIBE THE LEARNING TARGETS.

New Jersey Student Learning Standards That Support Learning Targets	
2023 New Jersey Student Learning Standards for Mathematics	
1. A.CED.A.2	1. Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.
2. F.IF.B.4	2. 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.
3. F.IF.B.5	3. 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.
4. F.IF.C.7a	4. Graph linear and quadratic functions and show intercepts, maxima, and minima.
5. F.BF.B.3	5. Identify the effect on the graph of replacing f(x) by f(x) +k, kf(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.
6. F.BF.A.1a	6. Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.
7. F.IF.A.1.c	7. 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.
8. F.LE.B.5	8. Interpret the parameters in a linear or exponential function in terms of a context.
NJSLS	**Interdisciplinary Connections**
1. L.KL.9-10.2.A	1. Acquire and use accurately general academic and domain-specific words and phrases, sufficient for reading, writing, speaking, and listening at the college and career readiness level.

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Reason abstractly and quantitatively: Investigate specific examples and represent them symbolically, and observe the relationships in numbers or symbols to derive conclusions about a concrete instance. Throughout the unit students are given problems that require them to:
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PART III: TRANSFER OF KNOWLEDGE AND SKILLS

DESCRIBE THE LEARNING EXPERIENCE.

How will students uncover content and build skills?

Section 8.1 Graphing $f(x)=ax^2$		
Specific Learning Objective	**Warm-Up/Starting Options**	**Practice & Apply Exercises**

• Identify characteristics of quadratic functions • Graph $f(x)=ax^2$	**Warm-Up:** Have students answer Start Thinking and/or Warm-Up questions from lesson 8.1 in the Big Ideas Resources file. Review answers as a class. Review common vocabulary words needed for this section.	Big Ideas Text p. 423 #1, 2-20 even, 32-35 Teacher created worksheet using Kuta software or other supplemental material.

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

Specific Learning Objective	Warm-Up/Starting Options	Practice & Apply Exercises
• Graph $f(x)=ax^2+c$	**Warm-Up:** Have students answer Start Thinking and/or Warm-Up questions from lesson 8.2 in the Big Ideas Resources file. Review answers as a class. Review common vocabulary words needed for this section.	Big Ideas Text p. 429 #1, 2-12 even, 18-28 even, 34, 38, 42-45 Teacher created worksheet using Kuta software or other supplemental material.

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

Specific Learning Objective	Warm-Up/Starting Options	Practice & Apply Exercises
• Graph $f(x)=ax^2+bx+c$	**Warm-Up:** Have students answer Start Thinking and/or Warm-Up questions from lesson 8.3 in the Big Ideas Resources file. Review answers as a class. Review common vocabulary words needed for this section.	Big Ideas Text p. 436 #1, 2-10, 13-16, 20, 27, 28, 37, 38, 42, 50-53 Teacher created worksheet using Kuta software or other supplemental material.

Section 8.4 Graphing $f(x)=a(x-h)^2+k$		
Specific Learning Objective	**Warm-Up/Starting Options**	**Practice & Apply Exercises**
• Graph $f(x)=a(x-h)^2+k$	**Warm-Up:** Have students answer Start Thinking and/or Warm-Up questions from lesson 8.4 in the Big Ideas Resources file. Review answers as a class. Review common vocabulary words needed for this section.	Big Ideas Text p. 446 #2, 20-34 even, 35-38, 40-44 even, 70, 79-82 Teacher created worksheet using Kuta software or other supplemental material.

PART IV: EVIDENCE OF LEARNING

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

Assessments		
Summative	**Formative**	**Performance**
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 Algebra 1 curriculum/syllabus at the conclusion of an instructional time period. • Diagnostic Pre-Test • Chapter Tests • Periodic Benchmarks	The effectiveness of the instructional program will be based on numerous activities and strategies including the following and are not limited to: • Teacher observations • Self-Assessments • Student record-keeping • Quizzes • Warm-ups • Exit Tickets • Participation in class discussions	The following assessments require students to utilize various strands of mathematics. • Projects • Performance Tasks • Homework • Classwork

● Standardized Tests	● Independent practice	

List of Accommodations and Modifications
- Special Education
- 504 Students
- At Risk Students
- MLL
- Gifted and Talented

State Mandates and Resources

- New Jersey Student Learning Standards
- Standards for Mathematical Practices

Black Horse Pike Regional School District
Where inspiring excellence is our standard, and student achievement is the result.

ML Algebra 1
Course Number: 033800

Updated: June 2024

PART I: UNIT RATIONALE

<u>WHY</u> ARE STUDENTS LEARNING THIS CONTENT AND THESE SKILLS?

Unit Title: Solving Quadratic Equations	
In this unit, students solve quadratic equations by factoring, graphing, and using square roots. Students will also simplify radical expressions and perform operations with radicals.	
Essential Questions	**Learning Targets/Objectives**
1. How do I solve quadratic equations? 2. How do I use properties of radicals in expressions and equations?	Students will be able to: • Solve quadratic equations by graphing • Use square roots to solve quadratic equations • Simplify radical expressions
Tier 2 Vocabulary *High-frequency words used throughout the unit*	**Tier 3 Vocabulary** *Discipline-specific words used throughout the unit*
Square root, expression, square, perfect square, denominator, numerator, zero of a function, quadratic	Radical, radicand, radical expression, root, quadratic formula

PART II: INSTRUCTIONAL STRATEGIES AND RESOURCES
DESCRIBE THE LEARNING TARGETS.

New Jersey Student Learning Standards That Support Learning Targets	
2023 New Jersey Student Learning Standards for Mathematics	
1. A.REI.A.2	1. Solve simple rational and radical equations in one variable, and give examples showing how extraneous solutions may arise.
2. A.CED.A.1	2. 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. Climate Change Example: Students may create equations and/or inequalities to represent the economic impact of climate change.
3. A.CED.A.2	3. Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.
4. A.CED.A.3	4. 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.
5. A.REI.B.4b	5. 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 $a+/-bi$ for real numbers a and b.
6. A.REI.D.11	6. 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
7. A.SSE.B.3	7. 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.
8. F.BF.B.3	8. 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.
NJSLS	**Interdisciplinary Connections**
1. L.KL.9-10.2.A	1. Acquire and use accurately general academic and domain-specific words and phrases, sufficient for reading, writing, speaking, and listening at the college and career readiness level.

2. SL.PE.9-10.1.D	2. Respond thoughtfully to various perspectives, summarize points of agreement and disagreement, and justify own views. Make new connections in light of the evidence and reasoning presented.
3. SL.PI.9-10.4	3. Present information, findings, and supporting evidence clearly, concisely, and logically. The content, organization, development, and style are appropriate to task, purpose, and audience.

2020 New Jersey Student Learning Standards for Career Readiness, Life Literacies, and Key Skills

1. 9.2.12.CAP.5	1. Assess and modify a personal plan to support current interests and postsecondary plans.
2. 9.4.12.CI.1	2. Demonstrate the ability to reflect, analyze, and use creative skills and ideas.
3. 9.4.5.DC.4	3. Model safe, legal, and ethical behavior when using online or offline technology
4. 9.4.12.CT.2	4. Explain the potential benefits of collaborating to enhance critical thinking and problem-solving.

2020 New Jersey Student Learning Standards for Computer Science and Design Thinking

1. 8.1.2.AP.4	1. Break down a task into a sequence of steps.

The 8 Mathematical Practices are embedded throughout the course and are evident in daily lessons, assignments, activities, assessments, and projects:

Make sense of problems and persevere in solving them: Take time to analyze the given information and what the problem is asking to help you to plan a solution pathway. Throughout the unit students are given problems that require them to:
- Explain the Meaning
- Find Entry Points
- Analyze Givens
- Interpret a Solution
- Make a Plan
- Consider Similar Problems
- Check Progress
- Consider Simpler Forms
- Problem Solve

Reason abstractly and quantitatively: Investigate specific examples and represent them symbolically, and observe the relationships in numbers or symbols to derive conclusions about a concrete instance. Throughout the unit students are given problems that require them to:
- Make Sense of Quantities
- Use Equations
- Use Expressions
- Understand Quantities
- Use Operations
- Contextualize
- Relationships
- Reason Abstractly

Construct viable arguments and critique the reasoning of others: Make and justify conclusions and decide whether others' arguments are correct or flawed. Throughout the unit students are given problems that require them to:
- Use Assumptions
- Use Defi nitions
- Use Prior Results
- Make Conjectures
- Build Arguments
- Analyze Conjectures
- Use Counterexamples

- Justify Conclusions
- Compare Arguments
- Construct Arguments
- Listen and Ask Questions
- Critique Reasoning
- Use Logic
- Error Analysis

Model with mathematics: Apply the mathematics to a real-life problem, and you interpret mathematical results in the context of the situation. Throughout the unit students are given problems that require them to:
- Apply Mathematics
- Simplify a Solution
- Use a Diagram
- Use a Table
- Use a Graph
- Use a Formula
- Analyze Relationships
- Interpret Results
- Model Real Life

Use appropriate tools strategically: Know what tools are available and think about how each tool might help solve a mathematical problem. Use a tool for its advantages, while being aware of its limitations. Throughout the unit students are given problems that require them to:
- Choose Tools
- Recognize Usefulness of Tools
- Use Other Resources
- Use Technology to Explore

Attend to precision: Develop a habit of being careful how you talk about concepts, label your work, and write your answers. Throughout the unit students are given problems that require them to:
- Communicate Precisely
- Use Clear Definitions
- State the Meaning of Symbols
- Specify Units
- Label Axes
- Calculate Accurately
- Understand Mathematical Terms

Look for and make use of structure: Look closely to see structure within a mathematical statement, or step back for an overview to see how individual parts make one single object. Throughout the unit students are given problems that require them to:
- View as Components
- Look for Patterns
- Look for Structure

Look for and express regularity in repeated reasoning: Notice patterns and make generalizations. Keeping in mind the goal of a problem helps you evaluate reasonableness of answers along the way. Throughout the unit students are given problems that require them to:
- Repeat Calculations
- Find General Methods
- Maintain Oversight
- Evaluate Results

Resources
Textbook
Textbook: Algebra I, A Common Core Curriculum– Big Ideas Math, Big Ideas Learning LLC, 2019
Online Resources
[Desmos Activities](#)   [Pear Assessment](#)   [IXL](#)   [Quizizz](#)   [EdPuzzle](#)   [Canva](#)   [Khan Academy](#)   [Inside Mathematics](#)   [NJDOE Digital Item Library](#)   [New Jersey Center for Teaching and Learning](#)   [New Jersey Climate Education Hub](#)
Videos
[Simplifying Square Roots](#)
Integrated Technology
- Google Suite: Google Classroom, Docs, Drive, Mail, etc…   - Devices: - Chromebooks   - Texas Instrument TI-84 Plus Graphing Calculator
ML Resources
Multi-Language Glossary

Gifted & Talented Resources
● Leveled Assessments ● Enrichment worksheets

PART III: TRANSFER OF KNOWLEDGE AND SKILLS

DESCRIBE THE LEARNING EXPERIENCE.

How will students uncover content and build skills?

Section 9.1 Properties of Radicals		
Specific Learning Objective	**Warm-Up/Starting Options**	**Practice & Apply Exercises**
● Use properties of radicals to simplify expressions ● Perform operations with radicals	**Warm-Up:** Have students answer Start Thinking and/or Warm-Up questions from lesson 9.1 in the Big Ideas Resources file. Review answers as a class. Review common vocabulary words needed for this section.	Big Ideas Text p. 485 #1-4, 5-10, 14-28 even, 37, 46-52 even, 61, 63, 75-80, 83-88, 108-111 Teacher created worksheet using Kuta software or other supplemental material.

Section 9.2 Solving Quadratic Expressions by Graphing

Specific Learning Objective	Warm-Up/Starting Options	Practice & Apply Exercises
• Solve quadratic equations by graphing • Use graphs to find an approximate the zeros of functions.	**Warm-Up:** Have students answer Start Thinking and/or Warm-Up questions from lesson 9.2 in the Big Ideas Resources file. Review answers as a class. Review common vocabulary words needed for this section.	Big Ideas Text p. 494 #1-4, 6-42 even, 53, 54, 66, 67 Teacher created worksheet using Kuta software or other supplemental material.

Section 9.3 Solving Quadratic Expressions Using Square Roots

Specific Learning Objective	Warm-Up/Starting Options	Practice & Apply Exercises
• Solve quadratic equations using square roots	**Warm-Up:** Have students answer Start Thinking and/or Warm-Up questions from lesson 9.3 in the Big Ideas Resources file. Review answers as a class. Review common vocabulary words needed for this section.	Big Ideas Text p. 501 #1, 2-30 even, 31-34, 40, 45-50 Teacher created worksheet using Kuta software or other supplemental material.

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