Wall Township Public Schools	Board Approval Date: [Pending Board Approval]

Course Title: Algebraic Concepts B (WHS)

Year One of a Two-Year LLD Algebra 1 Sequence

Course Description: Algebraic Concepts B is year two of a two-year LLD alternative to Algebra 1 CP for students receiving Special Education programming whose IEPs call for significant scaffolding, repetition, and a slower pace. Across the two years (Algebraic Concepts A and B), students complete the Algebra 1 content required to sit for the NJSLA Algebra 1 assessment. Instruction is anchored to BIG IDEAS — the essential, transferable understandings of each unit — rather than to every procedural extension found in the general education curriculum. Special focus will be paid to combining the general mathematical skills with life skills in which students can apply what they learn to everyday life.

New Jersey Student Learning Standards - Math

Vision for Mathematics Education in New Jersey

A New Jersey education in Mathematics builds quantitatively and analytically literate citizens prepared to meet the demands of college and career, and to engage productively in an information-driven society.

- leverages data in decision-making and as a lens for discussing, analyzing, and responding to practical questions.
- persists to make sense of and model problems arising in everyday life, society, and the workplace.
- thinks critically and strategically to assess quantitative relationships and solutions to complex problems.

Standards for Mathematical Practice*

The Standards for Mathematical Practice describe varieties of expertise that mathematics educators at all levels should seek to develop in their students. These practices rest on important "processes and proficiencies" with longstanding importance in mathematics education. The first of these are the NCTM process standards of problem solving, reasoning and proof, communication, representation, and connections. The second are the strands of mathematical proficiency specified in the National Research Council's report Adding It Up: adaptive reasoning, strategic competence, conceptual understanding (comprehension of mathematical concepts, operations and relations), procedural fluency (skill in carrying out procedures flexibly, accurately, efficiently and appropriately), and productive disposition (habitual inclination to see mathematics as sensible, useful, and worthwhile, coupled with a belief in diligence and one's own efficacy).

1. Make sense of problems and persevere in solving them
2. Reason abstractly and quantitatively
3. Construct viable arguments and critique the reasoning of others
4. Model with mathematics
5. Use appropriate tools strategically

6. Attend to precision
7. Look for and make use of structure
8. Look for and express regularity in repeated reasoning

**See end of document for additional information related to the mathematical practices.*

Inclusion of Climate Change Opportunities

( ) notes opportunities to integrate specific examples of climate change education provided by additional age-appropriate resources

The goal of inclusion of climate change education implementation is to foster generations of New Jersey students that can analyze, question, interpret, to think independently, and bring critical deduction to fulfill, and to lead in jobs created by burgeoning industries of the future green economy.

Course Sequence & Pacing	
Unit Title	**Estimated Number of Instructional Periods**
Unit 1: Expressions *Core — taught both years* • Write and evaluate numerical expressions • Write and evaluate algebraic expressions • Apply the properties of real numbers to simplify expressions • Simplify expressions using the Distributive Property (area model) • Evaluate absolute value expressions	7
Unit 2: Equations and Inequalities in One Variable *Core — taught both years* • Create and interpret equations that describe relationships • Solve multi-step equations • Solve equations with the variable on each side • Solve equations involving simple proportions • Solve one- and multi-step inequalities	21
Unit 3: Relations and Functions *Core — taught both years* • Represent relations with graphs, ordered pairs, and tables • Determine if a relation is a function and find function values both algebraically and graphically • Identify linear and nonlinear functions and continuous and discrete functions	17

• Determine domain and range of continuous graphs informally (in words) rather than using formal inequality notation • Identify intercepts of functions and solve equations by graphing	
Unit 4: Linear and Nonlinear Functions *Core — taught both years* • Graph linear functions by using tables and intercepts • Find and interpret the rate of change and slope of lines • Graph equations in slope-intercept form	17
Unit 5: Data Analysis and Linear Models *Core — taught both years* • Create linear equations in slope-intercept form • Use scatter plots to make and evaluate predictions • Use a line of best fit to determine how well a linear function fits a set of data • Represent data using dot plots, histograms, and bar graphs • Distinguish between correlation and causation	14
Unit 6: Systems of Linear Equations & Inequalities *Core — taught both years* • Solve systems of equations by graphing • Solve systems of equations by using substitution • Solve systems of equations by elimination with addition or subtraction • Graph a linear inequality on the coordinate plane	18
Unit 7: Polynomials *Concepts B only* • Add and subtract polynomials by combining like terms • Multiply polynomials by monomials • Multiply polynomials by polynomials • Factor polynomials by applying the distributive property (GCF) • Factor simple trinomials (a = 1) into two binomials	14
Unit 8: Quadratic Functions *Concepts B only* • Analyze and graph quadratic functions • Write quadratic equations and solve them by graphing • Solve quadratic equations by factoring and using the square root property • Solve quadratic equations by using the quadratic formula (with reference sheet)	17

Total Instructional Periods	125

**Instructional periods are scheduled at WHS for 56 minutes on a rotating drop schedule meeting for approximately 125 - 135 instructional periods.

Unit 1

Desired Results

Unit 1: Expressions

Unit Summary: In this unit, students begin by learning to write and evaluate numerical expressions using the order of operations. They then transition to algebraic expressions, gaining experience with variables, constants, and combining like terms. The unit emphasizes the properties of real numbers as tools for simplifying expressions, with a focused, hands-on look at the Distributive Property using area models. Students also explore absolute value as a measure of distance on the number line. This unit will focus on how these mathematical skills contribute to life skills such as money management, budgeting, price comparison, determining earnings, cooking, travel planning, time management, independent living arrangements, banking, recreation, and measuring.

Unit 1: BIG IDEA

An expression is a math "phrase" made of numbers, variables, and operations. We can evaluate it (find its value) or simplify it (rewrite it in a shorter, equivalent form).

Learning Standards

NJSLS Math:

A.SSE Seeing Structure in Expressions

A.SSE.A Interpret the Structure of Expressions

1. Interpret expressions that represent a quantity in terms of its context.

- **a.** Interpret parts of an expression, such as terms, factors, and coefficients.
- **b.** Interpret complicated expressions by viewing one or more of their parts as a single entity.

2. Use the structure of an expression to identify ways to rewrite it (e.g., simplifying using the properties of real numbers).

Standards for Mathematical Practice:

1. Make sense of problems and persevere in solving them
2. Reason abstractly and quantitatively
3. Construct viable arguments and critique the reasoning of others
4. Model with mathematics
5. Use appropriate tools strategically
6. Attend to precision
7. Look for and make use of structure
8. Look for and express regularity in repeated reasoning

Interdisciplinary Connections

Career Readiness, Life Literacies, & Key Skills (CLKS):

9.4.12.CI.1 Demonstrate the ability to reflect, analyze, and use creative skills and ideas.

9.4.12.CT.2: Explain the potential benefits of collaborating to enhance critical thinking and problem solving

9.4.12.TL.3 Analyze the effectiveness of the process and quality of collaborative environments.

Computer Science & Design Thinking (CS & DT):

8.1.12.CS.4: Develop guidelines that convey systematic troubleshooting strategies that others can use to identify and fix errors.

8.2.12.NT.1: Explain how different groups can contribute to the overall design of a product.

Learning Targets

Unit Essential Questions:	**Unit Enduring Understandings:**
• How can mathematical expressions be represented and evaluated? • How can mathematical expressions and units help us represent, solve, and make sense of real-world problems? • Can expressions that appear to be different be equivalent?	• Mathematical expressions can be used to represent real-world situations. • Quantities and their relationships can be represented using variables and expressions. • Units and quantities are essential in solving and interpreting mathematical problems.

Vocabulary: Absolute Value, Algebraic Expression, Coefficient, Constant Term, Define a Variable, Equivalent Expressions, Evaluate, Exponent, Like Terms, Numerical Expression, Simplest Form, Term, Variable, Variable Term

Students Will Be Able To:

- Write and evaluate numerical expressions *[1-1]*
- Write and evaluate algebraic expressions *[1-2]*
- Apply the properties of real numbers to simplify expressions *[1-3]*
- Simplify expressions using the Distributive Property (area model) *[1-4]*
- Evaluate absolute value expressions *[1-5]*

Learning Activities:

- Reveal online practice based on each lesson (Launch → Explore → Learn/Examples → Check → Exit Ticket → Practice), scaffolded and differentiated for LLD learners.
- ALEKS platform for individualized, self-paced skill practice based on knowledge-check results.
- Small group instruction, small group intervention, and re-teach stations; teacher-created visual notes, reference sheets, and step-by-step cue cards.

- Manipulatives and visual/concrete models before moving to abstract representations.
- Communicators (mini whiteboards) and low-stakes checks for understanding throughout each lesson.
- LLD Learning Activities - vocabulary sort and reference sheet, order of operations color coding, grocery shopping expressions, restaurant bill expressions, paycheck expressions, budget building and expressions, property sort, calculating a floor plan, party planning with expressions, absolute value number line walk, absolute value practice - money, temperature, distance. CBI as appropriate

Assessment Evidence

Formative Assessments: Quizzes, Warm-Ups, Exit Passes, Communicators, Classwork

Summative Assessments: Cumulative Assessments (modified format, reduced item count, visual supports)

Common Benchmark Assessments: Common Unit Assessments, LinkIt! Benchmarks (accommodated per IEP)

Alternative Assessments: Modified Unit Assessments, Modified Projects, Other Modified Assessments

Core Instructional & Supplemental Materials

Math Program: McGraw Hill ConnectEd - Reveal Algebra 1 (modified/foundational lessons), ALEKS (Assessment and Learning in Knowledge Spaces)

DeltaMath, Khan Academy, Desmos, Graphing Calculators, manipulatives and visual models, teacher-created scaffolded notes and reference sheets

LinkIt! Benchmarks, LinkIt! Test Bank

Accommodations and Modifications: Students with Disabilities, English Language Learners, Students at Risk of Failure, Students with 504s, Gifted & Talented Students

Specific Strategies and Practices that Support Students with Disabilities:

Students receiving Special Education programming have specific goals and objectives, as well as accommodations and modifications outlined within their Individualized Education Plans (IEP) due to an identified disability and/or diagnosis. In addition to exposure to the general education curriculum, the instruction is differentiated based upon the student's needs. The IEP acts as a supplemental curriculum guide inclusive of instructional strategies that support each learner.

Small group/one-to-one instruction; additional time; review and restate directions; movement/sensory breaks; extra visual and verbal cues and prompts; preferential seating; consistent daily routine; chunked/scaffolded steps; graphic organizers and reference sheets (formula banks, step-by-step cue cards); manipulatives and visual models; checklists; immediate and frequent feedback; frequent comprehension checks; reduced number of problems per practice set; alternate or reduced work within ALEKS, ConnectEd, DeltaMath, and Link It assignments.

Specific Strategies and Practices that Support English Language Learners:

English language learner (ELL) is a national-origin-minority student who is limited-English-proficient. This term is often preferred over limited-English-proficient (LEP) as it highlights accomplishments rather than deficits.

Pre-teaching of vocabulary and concepts; personal glossary/word bank with visuals; extended time; simplified/verbal instructions; frequent breaks; visual learning, including graphic organizers; use of cognates to increase comprehension; teacher modeling; pairing students with beginning English language skills with students who have more advanced English language skills; scaffolding; word walls; think-pair-share; cooperative learning groups; alternate or reduced work within ALEKS, ConnectEd, DeltaMath, and Link It assignments.

Students at Risk of Failure:

Home/school connection; alternative assessments; learning contracts; homogeneous grouping; supplemental instruction; think-pair-share by readiness; homework options; differentiated online practice; leveled rubrics; tiered levels of support; tiered activities; small group instruction; work-alone or group-work choice; opportunities for make-up work or reduced number of assignments; access to extra help when possible.

Students with 504 Plans:

Teachers are responsible for implementing designated services and strategies identified on a student's 504 Plan. 504 plans are formal plans that schools develop to give students the support they need and cover any condition that limits daily activities in a major way. Students' accommodations are outlined in their individual 504 plan.

Specific Strategies and Practices that Support Gifted & Talented Students:

Homogeneous grouping; small group in-depth instruction; differentiated online practice; alternative assessments; pre-assess to provide differentiated instruction to accelerate learning; alternate or reduced work within ALEKS, ConnectEd, DeltaMath, and Link It assignments.

Unit 2

Desired Results

Unit 2: Equations and Inequalities in One Variable

Unit Summary: This unit focuses on solving equations using algebraic methods. Students write equations from real-world situations and solve one-step and multi-step equations, including equations with the variable on both sides. Students also solve one and multi-step inequalities and equations involving simple proportions, applying the same balancing strategy throughout.

Unit 2 BIG IDEA

Solving an equation means finding the value that makes both sides equal. Whatever you do to one side, you must do to the other — and the same balancing moves works for inequalities too.

Learning Standards

NJSLS Math:

A.CED Creating Equations

A.CED.A Creating Equations that describe numbers or relationships

1. Create equations and inequalities in one variable and use them to solve problems.

Algebra 1 Limits and Clarifications: Limited to linear, quadratic and exponential equations with integer exponents.

A.REI Reasoning with Equations and Inequalities

A.REI.A Understand solving equations as a process of reasoning and explain the reasoning

1. 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.

Algebra 1 Limits and Clarifications: Limited to quadratic equations.

Standards for Mathematical Practice

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5. Use appropriate tools strategically
6. Attend to precision
7. Look for and make use of structure
8. Look for and express regularity in repeated reasoning

Interdisciplinary Connections

Career Readiness, Life Literacies, & Key Skills (CLKS):

9.4.12.CI.1 Demonstrate the ability to reflect, analyze, and use creative skills and ideas.

9.4.12.CT.1: Identify problem-solving strategies used in the development of an innovative product or practice.

9.4.12.CT.2: Explain the potential benefits of collaborating to enhance critical thinking and problem solving

9.4.12.TL.1: Assess digital tools based on features such as accessibility options, capacities, and utility for accomplishing a specified task.

9.4.12.TL.3 Analyze the effectiveness of the process and quality of collaborative environments.

Computer Science & Design Thinking (CS & DT):

8.1.12.CS.4: Develop guidelines that convey systematic troubleshooting strategies that others can use to identify and fix errors.

8.1.12.DA.1: Create interactive data visualizations using software tools to help others better understand real world phenomena, including climate change.

8.1.12.DA.5: Create data visualizations from large data sets to summarize, communicate, and support different interpretations of real-world phenomena.

8.2.12.NT.1: Explain how different groups can contribute to the overall design of a product.

Learning Targets

Unit Essential Questions:	**Unit Enduring Understandings:**
• How can writing and solving equations help you solve problems in the real world? • What does it mean to solve an equation or inequality?	• Equations and inequalities express relationships between quantities. • Maintaining equality or inequality requires performing equivalent operations on both sides.

Vocabulary: Equation, Equivalent Equations, Formula, Multi-step Equation, Proportion, Solution, Solving an Equation

Students Will Be Able To:

- Create and interpret equations that describe relationships *[2-1]*
- Solve multi-step equations *[2-3]*
- Solve equations with the variable on each side *[2-4]*
- Solve equations involving simple proportions *[2-6]*
- Solve one- and multi-step inequalities *[6-1 & 6-2]*

Learning Activities:

- Reveal online practice based on each lesson (Launch → Explore → Learn/Examples → Check → Exit Ticket → Practice), scaffolded and differentiated for LLD learners.

- ALEKS platform for individualized, self-paced skill practice based on knowledge-check results.
- Small group instruction, small group intervention, and re-teach stations; teacher-created visual notes, reference sheets, and step-by-step cue cards.
- Manipulatives and visual/concrete models before moving to abstract representations.
- Communicators (mini whiteboards) and low-stakes checks for understanding throughout each lesson.
- LLD Learning Activities - vocabulary sort, real world scenario equation break down, balancing equations with manipulatives, equation ladders, multi-step equation color coding, paycheck equations, budget equations, multi-step shopping, comparing job offers, grocery unit pricing, "Can I afford it," proportion recipes (life skills --> cooking), proportion shopping, create equations involving money, shopping, work, sports, transportation and/or entertainment, CBI as appropriate

Assessment Evidence

Formative Assessments: Quizzes, Warm-Ups, Exit Passes, Communicators, Classwork

Summative Assessments: Cumulative Assessments (modified format, reduced item count, visual supports)

Common Benchmark Assessments: Common Unit Assessments, LinkIt! Benchmarks (accommodated per IEP)

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Small group/one-to-one instruction; additional time; review and restate directions; movement/sensory breaks; extra visual and verbal cues and prompts; preferential seating; consistent daily routine; chunked/scaffolded steps; graphic organizers and reference sheets (formula banks,

step-by-step cue cards); manipulatives and visual models; checklists; immediate and frequent feedback; frequent comprehension checks; reduced number of problems per practice set; alternate or reduced work within ALEKS, ConnectEd, DeltaMath, and Link It assignments.

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Students at Risk of Failure:

Home/school connection; alternative assessments; learning contracts; homogeneous grouping; supplemental instruction; think-pair-share by readiness; homework options; differentiated online practice; leveled rubrics; tiered levels of support; tiered activities; small group instruction; work-alone or group-work choice; opportunities for make-up work or reduced number of assignments; access to extra help when possible.

Students with 504 Plans:

Teachers are responsible for implementing designated services and strategies identified on a student's 504 Plan. 504 plans are formal plans that schools develop to give students the support they need and cover any condition that limits daily activities in a major way. Students' accommodations are outlined in their individual 504 plan.

Specific Strategies and Practices that Support Gifted & Talented Students:

Homogeneous grouping; small group in-depth instruction; differentiated online practice; alternative assessments; pre-assess to provide differentiated instruction to accelerate learning; alternate or reduced work within ALEKS, ConnectEd, DeltaMath, and Link It assignments.

Unit 3

Desired Results

Unit 3: Relations and Functions

Unit Summary: This unit introduces relations and the special subset called functions. Students represent relations using tables, graphs, and mapping diagrams, learn to identify functions using the Vertical Line Test, and explore linear vs. nonlinear and continuous vs. discrete relationships. Students identify intercepts and connect graphs to real situations. Emphasis will be placed on the concept that functions are a way of describing how one thing changes when something else changes. Students can use this concept featured in a variety of life skills.

Unit 3 BIG IDEA

A function is a special relationship where every input has exactly one output. We can show that relationship with a table, a graph, ordered pairs, or an equation — and they all describe the same thing.

Learning Standards

NJSLS Math:

N.Q Quantities

N.Q.A Reason quantitatively and use units to solve problems

1. 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.

F.IF Interpreting Functions

F.IF.A Understand the concept of a function and use function notation

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.

2. Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.

F.IF.B Interpret functions that arise in applications in terms of the context

4. For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship.

Algebra 1 Limits and Clarifications: Limited to linear functions, quadratic functions, and exponential functions with domains in the integers. Tasks should have a real-world context.

5. Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes.

A.REI Reasoning with Equations and Inequalities

A.REI.D Represent and solve equations and inequalities graphically

10. Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).

Standards for Mathematical Practice

1. Make sense of problems and persevere in solving them
2. Reason abstractly and quantitatively
3. Construct viable arguments and critique the reasoning of others
4. Model with mathematics
5. Use appropriate tools strategically
6. Attend to precision
7. Look for and make use of structure
8. Look for and express regularity in repeated reasoning

Interdisciplinary Connections

Career Readiness, Life Literacies, & Key Skills (CLKS):

9.4.12.CI.1 Demonstrate the ability to reflect, analyze, and use creative skills and ideas.

9.4.12.CT.2: Explain the potential benefits of collaborating to enhance critical thinking and problem solving

9.4.12.TL.1: Assess digital tools based on features such as accessibility options, capacities, and utility for accomplishing a specified task.

9.4.12.TL.3 Analyze the effectiveness of the process and quality of collaborative environments.

Computer Science & Design Thinking (CS & DT):

8.1.12.CS.4: Develop guidelines that convey systematic troubleshooting strategies that others can use to identify and fix errors.

8.1.12.DA.5: Create data visualizations from large data sets to summarize, communicate, and support different interpretations of real-world phenomena.

8.2.12.NT.1: Explain how different groups can contribute to the overall design of a product.

Learning Targets

Unit Essential Questions:	Unit Enduring Understandings:
• Why are representations of relations and functions useful? • How do relations and functions help us describe relationships between quantities?	• Relations and functions describe relationships between quantities. • The vertical line test determines if a graph represents a function.

Vocabulary: Continuous function, Decreasing, Dependent variable, Discrete function, Domain, Function, Function notation, Increasing, Independent variable, Linear function, Mapping, Negative, Nonlinear function, Positive, Range, Relation, x-intercept, y-intercept, Zero

Students Will Be Able To:

- Represent relations with graphs, ordered pairs, and tables *[3-1]*

- Determine if a relation is a function and find function values both algebraically and graphically *[3-2]*
- Identify linear and nonlinear functions and continuous and discrete functions *[3-3]*
- Determine domain and range of continuous graphs informally (in words) rather than using formal inequality notation *[3-mod]*
- Identify intercepts of functions and solve equations by graphing *[3-4]*

Learning Activities:

- Reveal online practice based on each lesson (Launch → Explore → Learn/Examples → Check → Exit Ticket → Practice), scaffolded and differentiated for LLD learners.
- ALEKS platform for individualized, self-paced skill practice based on knowledge-check results.
- Small group instruction, small group intervention, and re-teach stations; teacher-created visual notes, reference sheets, and step-by-step cue cards.
- Manipulatives and visual/concrete models before moving to abstract representations.
- Communicators (mini whiteboards) and low-stakes checks for understanding throughout each lesson.
- LLD Learning Activities: graphs, ordered pairs, and tables for money earned and shopping, creating predictable relationships in the community, plotted points treasure hunt, table/ordered pair/graph sequencing, discrete vs continuous functions, real life function project, CBI as appropriate

Assessment Evidence

Formative Assessments: Quizzes, Warm-Ups, Exit Passes, Communicators, Classwork

Summative Assessments: Cumulative Assessments (modified format, reduced item count, visual supports)

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Accommodations and Modifications: Students with Disabilities, English Language Learners, Students at Risk of Failure, Students with 504s, Gifted & Talented Students

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Students at Risk of Failure:

Home/school connection; alternative assessments; learning contracts; homogeneous grouping; supplemental instruction; think-pair-share by readiness; homework options; differentiated online practice; leveled rubrics; tiered levels of support; tiered activities; small group instruction; work-alone or group-work choice; opportunities for make-up work or reduced number of assignments; access to extra help when possible.

Students with 504 Plans:

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Specific Strategies and Practices that Support Gifted & Talented Students:

Homogeneous grouping; small group in-depth instruction; differentiated online practice; alternative assessments; pre-assess to provide differentiated instruction to accelerate learning; alternate or reduced work within ALEKS, ConnectEd, DeltaMath, and Link It assignments.

Unit 4

Desired Results

Unit 4: Linear and Nonlinear Functions

Unit Summary: This unit explores the characteristics of linear functions. Students graph linear functions using tables and intercepts, then focus on slope and rate of change as the defining feature of a line. Students learn to graph equations in slope-intercept form and apply this to real situations such as earning money, shopping, gas usage, exercise, temperature, and saving money.

Unit 4 BIG IDEA

A linear function has a constant rate of change — its slope. Once we know the slope and a starting point (y-intercept), we can graph the line and use it to make predictions.

Learning Standards

NJSLS Math:

A.CED Creating Equations

A.CED.A Create equations that describe numbers or relationships

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

A.REI Reasoning with Equations and Inequalities

A.REI.D Represent and solve equations and inequalities graphically

10. Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).

F.IF Interpreting Functions

F.IF.B Interpret functions that arise in applications in terms of the context

4. For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship.

Algebra 1 Limits and Clarifications: Limited to linear functions, quadratic functions, and exponential functions with domains in the integers. Tasks should have a real-world context.

6. Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.

F.IF.C Analyze functions using different representations

7. Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.

- **a.** Graph linear and quadratic functions and show intercepts, maxima, and minima.

F.BF Building Functions

F.BF.A Build a function that models a relationship between two quantities

1. Write a function that describes a relationship between two quantities.

a. Determine an explicit expression, a recursive process, or steps for calculation from a context. *Algebra 1 Limits and Clarifications: Limited to linear functions. Limited to function notation. Tasks do not use subscript notation. Tasks have a real-world context.*

F.LE Linear and Exponential Models

5. Interpret the parameters in a linear or exponential function in terms of a context.

Algebra 1 Limits and Clarifications: Exponential functions are limited to those with domains in the integers. Tasks have a real-world context.

Standards for Mathematical Practice:

1. Make sense of problems and persevere in solving them
2. Reason abstractly and quantitatively
3. Construct viable arguments and critique the reasoning of others
4. Model with mathematics
5. Use appropriate tools strategically
6. Attend to precision
7. Look for and make use of structure
8. Look for and express regularity in repeated reasoning

Interdisciplinary Connections

Career Readiness, Life Literacies, & Key Skills (CLKS):

9.4.12.CI.1 Demonstrate the ability to reflect, analyze, and use creative skills and ideas.

9.4.12.CT.2: Explain the potential benefits of collaborating to enhance critical thinking and problem solving

9.4.12.TL.1: Assess digital tools based on features such as accessibility options, capacities, and utility for accomplishing a specified task.

9.4.12.TL.3 Analyze the effectiveness of the process and quality of collaborative environments.

Computer Science & Design Thinking (CS & DT):

8.1.12.CS.4: Develop guidelines that convey systematic troubleshooting strategies that others can use to identify and fix errors.

8.1.12.DA.5: Create data visualizations from large data sets to summarize, communicate, and support different interpretations of real-world phenomena.

8.2.12.NT.1: Explain how different groups can contribute to the overall design of a product.

Learning Targets

Unit Essential Questions:	Unit Enduring Understandings:
• What does the slope of a line tell us about the relationship between two variables?	• The slope of a linear equation represents the rate of change and indicates the steepness and direction of the line.

• Why are linear equations useful for modeling real-world situations with a constant rate of change?	• A linear equation describes a constant rate of change between two variables, which can model real-world relationships.

Vocabulary: Interval, Rate of change, Slope

Students Will Be Able To:

- Graph linear functions by using tables and intercepts *[4-1]*
- Find and interpret the rate of change and slope of lines *[4-2]*
- Graph equations in slope-intercept form *[4-3]*

Learning Activities:

- Reveal online practice based on each lesson (Launch → Explore → Learn/Examples → Check → Exit Ticket → Practice), scaffolded and differentiated for LLD learners.
- ALEKS platform for individualized, self-paced skill practice based on knowledge-check results.
- Small group instruction, small group intervention, and re-teach stations; teacher-created visual notes, reference sheets, and step-by-step cue cards.
- Manipulatives and visual/concrete models before moving to abstract representations.
- Communicators (mini whiteboards) and low-stakes checks for understanding throughout each lesson.
- Learning activities for LLD - Hours worked and money earned scenarios, budgeting and saving practice, shopping budget graphing, cell phone plan comparison, rideshare cost, positive - negative - and zero slope examples, starting point practice, walking/driving distance and time, comparing spending plans, CBI as appropriate

Assessment Evidence

Formative Assessments: Quizzes, Warm-Ups, Exit Passes, Communicators, Classwork

Summative Assessments: Cumulative Assessments (modified format, reduced item count, visual supports)

Common Benchmark Assessments: Common Unit Assessments, LinkIt! Benchmarks (accommodated per IEP)

Alternative Assessments: Modified Unit Assessments, Modified Projects, Other Modified Assessments

Core Instructional & Supplemental Materials

Math Program: McGraw Hill ConnectEd - Reveal Algebra 1 (modified/foundational lessons), ALEKS (Assessment and Learning in Knowledge Spaces)

DeltaMath, Khan Academy, Desmos, Graphing Calculators, manipulatives and visual models, teacher-created scaffolded notes and reference sheets

LinkIt! Benchmarks, LinkIt! Test Bank

Accommodations and Modifications: Students with Disabilities, English Language Learners, Students at Risk of Failure, Students with 504s, Gifted & Talented Students

Specific Strategies and Practices that Support Students with Disabilities:

Students receiving Special Education programming have specific goals and objectives, as well as accommodations and modifications outlined within their Individualized Education Plans (IEP) due to an identified disability and/or diagnosis. In addition to exposure to the general education curriculum, the instruction is differentiated based upon the student's needs. The IEP acts as a supplemental curriculum guide inclusive of instructional strategies that support each learner.

Small group/one-to-one instruction; additional time; review and restate directions; movement/sensory breaks; extra visual and verbal cues and prompts; preferential seating; consistent daily routine; chunked/scaffolded steps; graphic organizers and reference sheets (formula banks, step-by-step cue cards); manipulatives and visual models; checklists; immediate and frequent feedback; frequent comprehension checks; reduced number of problems per practice set; alternate or reduced work within ALEKS, ConnectEd, DeltaMath, and Link It assignments.

Specific Strategies and Practices that Support English Language Learners:

English language learner (ELL) is a national-origin-minority student who is limited-English-proficient. This term is often preferred over limited-English-proficient (LEP) as it highlights accomplishments rather than deficits.

Pre-teaching of vocabulary and concepts; personal glossary/word bank with visuals; extended time; simplified/verbal instructions; frequent breaks; visual learning, including graphic organizers; use of cognates to increase comprehension; teacher modeling; pairing students with beginning English language skills with students who have more advanced English language skills; scaffolding; word walls; think-pair-share; cooperative learning groups; alternate or reduced work within ALEKS, ConnectEd, DeltaMath, and Link It assignments.

Students at Risk of Failure:

Home/school connection; alternative assessments; learning contracts; homogeneous grouping; supplemental instruction; think-pair-share by readiness; homework options; differentiated online practice; leveled rubrics; tiered levels of support; tiered activities; small group instruction; work-alone or group-work choice; opportunities for make-up work or reduced number of assignments; access to extra help when possible.

Students with 504 Plans:

Teachers are responsible for implementing designated services and strategies identified on a student's 504 Plan. 504 plans are formal plans that schools develop to give students the support they need and cover any condition that limits daily activities in a major way. Students' accommodations are outlined in their individual 504 plan.

Specific Strategies and Practices that Support Gifted & Talented Students:

Homogeneous grouping; small group in-depth instruction; differentiated online practice; alternative assessments; pre-assess to provide differentiated instruction to accelerate learning; alternate or reduced work within ALEKS, ConnectEd, DeltaMath, and Link It assignments.

Unit 5

Desired Results

Unit 5: Data Analysis and Linear Models

Unit Summary: Students explore how data can be represented, interpreted, and modeled. Students use scatter plots to look for a relationship between two variables and find a line of best fit to make predictions. Students also represent data using dot plots, histograms, and bar graphs. Special focus will be paid to the practical life skills - collecting data, comparing data, understanding patterns, making predictions, making informed decisions, and recognizing cause and effect.

Unit 5 BIG IDEA

When two quantities are related, we can plot the pairs on a scatter plot, draw a line that best fits the pattern, and use that line to make predictions.

Learning Standards

NJSLS Math:

N.Q Quantities

N.Q.A Reason quantitatively and use units to solve problems

1. 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.

A.CED Creating Equations

A.CED.A Create equations that describe numbers or relationships

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

F.BF Building Functions

F.BF.A Build a function that models a relationship between two quantities

1. Write a function that describes a relationship between two quantities.

a. Determine an explicit expression, a recursive process, or steps for calculation from a context.
Algebra 1 Limits and Clarifications: Limited to linear functions. Limited to function notation. Tasks do not use subscript notation. Tasks have a real-world context.

S.ID Interpreting Categorical and Quantitative Data

S.ID.A Summarize, represent, and interpret data on a single count or measurement variable

1. Represent data with plots on the real number line (dot plots, histograms, and box plots).
Algebra 1 Limits and Clarifications: Limited to not more than two different data sets. Tasks have a real-world context.

S.ID.B Summarize, represent, and interpret data on two categorical and quantitative variables

6. Represent data on two quantitative variables on a scatter plot and describe how the variables are related.

a. Fit a function to the data (including with the use of technology); use functions fitted to data to solve problems in the context of the data.

Algebra 1 Limits and Clarifications: Exponential functions are limited to those with domains in the integers. Quadratic functions are not included. Tasks have a real-world context.

c. Fit a linear function for a scatter plot that suggests a linear association (line of best fit).

S.ID.C Interpret linear models

7. Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.

9. Distinguish between correlation and causation.

Standards for Mathematical Practice

1. Make sense of problems and persevere in solving them
2. Reason abstractly and quantitatively
3. Construct viable arguments and critique the reasoning of others
4. Model with mathematics
5. Use appropriate tools strategically
6. Attend to precision
7. Look for and make use of structure
8. Look for and express regularity in repeated reasoning

Interdisciplinary Connections

Career Readiness, Life Literacies, & Key Skills (CLKS):

9.4.12.CI.1 Demonstrate the ability to reflect, analyze, and use creative skills and ideas.

9.4.12.CT.2: Explain the potential benefits of collaborating to enhance critical thinking and problem solving

9.4.12.TL.1: Assess digital tools based on features such as accessibility options, capacities, and utility for accomplishing a specified task.

9.4.12.TL.3 Analyze the effectiveness of the process and quality of collaborative environments.

Computer Science & Design Thinking (CS & DT):

8.1.12.CS.4: Develop guidelines that convey systematic troubleshooting strategies that others can use to identify and fix errors.

8.1.12.DA.5: Create data visualizations from large data sets to summarize, communicate, and support different interpretations of real-world phenomena.

8.2.12.NT.1: Explain how different groups can contribute to the overall design of a product.

Learning Targets

Unit Essential Questions:	Unit Enduring Understandings:
• What does the slope of a line tell us about the relationship between two variables?	• A linear equation describes a constant rate of change between two variables, which can model real-world relationships.

• How can writing and interpreting linear equations help us analyze trends and make predictions?	• Linear equations can be used to model real-life situations such as budgeting and distance-rate-time problems.

Vocabulary: Bar graph, Dot plot, Histogram, Scatter plot, Line of best fit

Students Will Be Able To:

- Create linear equations in slope-intercept form *[5-1]*
- Use scatter plots to make and evaluate predictions *[5-4]*
- Use a line of best fit to determine how well a linear function fits a set of data *[5-5]*
- Represent data using dot plots, histograms, and bar graphs *[5-2]*
- Distinguish between correlation and causation *[5-6]*

Learning Activities:

- Reveal online practice based on each lesson (Launch → Explore → Learn/Examples → Check → Exit Ticket → Practice), scaffolded and differentiated for LLD learners.
- ALEKS platform for individualized, self-paced skill practice based on knowledge-check results.
- Small group instruction, small group intervention, and re-teach stations; teacher-created visual notes, reference sheets, and step-by-step cue cards.
- Manipulatives and visual/concrete models before moving to abstract representations.
- Communicators (mini whiteboards) and low-stakes checks for understanding throughout each lesson.
- LLD Learning Activities: linear equations in slope intercept form for paychecks, savings plans, memberships. Scatter plot creations and predictions - hours studied/grades, hours worked/money earned, screen time/sleep. CBI data charts and graphs, choose the best graph, correlation vs. causation, personal data investigation, CBI as appropriate

Assessment Evidence

Formative Assessments: Quizzes, Warm-Ups, Exit Passes, Communicators, Classwork

Summative Assessments: Cumulative Assessments (modified format, reduced item count, visual supports)

Common Benchmark Assessments: Common Unit Assessments, LinkIt! Benchmarks (accommodated per IEP)

Alternative Assessments: Modified Unit Assessments, Modified Projects, Other Modified Assessments

Core Instructional & Supplemental Materials

Math Program: McGraw Hill ConnectEd - Reveal Algebra 1 (modified/foundational lessons), ALEKS (Assessment and Learning in Knowledge Spaces)

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LinkIt! Benchmarks, LinkIt! Test Bank

Accommodations and Modifications: Students with Disabilities, English Language Learners, Students at Risk of Failure, Students with 504s, Gifted & Talented Students

Specific Strategies and Practices that Support Students with Disabilities:

Students receiving Special Education programming have specific goals and objectives, as well as accommodations and modifications outlined within their Individualized Education Plans (IEP) due to an identified disability and/or diagnosis. In addition to exposure to the general education curriculum, the instruction is differentiated based upon the student's needs. The IEP acts as a supplemental curriculum guide inclusive of instructional strategies that support each learner.

Small group/one-to-one instruction; additional time; review and restate directions; movement/sensory breaks; extra visual and verbal cues and prompts; preferential seating; consistent daily routine; chunked/scaffolded steps; graphic organizers and reference sheets (formula banks, step-by-step cue cards); manipulatives and visual models; checklists; immediate and frequent feedback; frequent comprehension checks; reduced number of problems per practice set; alternate or reduced work within ALEKS, ConnectEd, DeltaMath, and Link It assignments.

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English language learner (ELL) is a national-origin-minority student who is limited-English-proficient. This term is often preferred over limited-English-proficient (LEP) as it highlights accomplishments rather than deficits.

Pre-teaching of vocabulary and concepts; personal glossary/word bank with visuals; extended time; simplified/verbal instructions; frequent breaks; visual learning, including graphic organizers; use of cognates to increase comprehension; teacher modeling; pairing students with beginning English language skills with students who have more advanced English language skills; scaffolding; word walls; think-pair-share; cooperative learning groups; alternate or reduced work within ALEKS, ConnectEd, DeltaMath, and Link It assignments.

Students at Risk of Failure:

Home/school connection; alternative assessments; learning contracts; homogeneous grouping; supplemental instruction; think-pair-share by readiness; homework options; differentiated online practice; leveled rubrics; tiered levels of support; tiered activities; small group instruction; work-alone or group-work choice; opportunities for make-up work or reduced number of assignments; access to extra help when possible.

Students with 504 Plans:

Teachers are responsible for implementing designated services and strategies identified on a student's 504 Plan. 504 plans are formal plans that schools develop to give students the support they need and cover any condition that limits daily activities in a major way. Students' accommodations are outlined in their individual 504 plan.

Specific Strategies and Practices that Support Gifted & Talented Students:

Homogeneous grouping; small group in-depth instruction; differentiated online practice; alternative assessments; pre-assess to provide differentiated instruction to accelerate learning; alternate or reduced work within ALEKS, ConnectEd, DeltaMath, and Link It assignments.

Unit 6

Desired Results

Unit 6: Systems of Linear Equations & Inequalities

Unit Summary: Students learn that a system of equations is a set of two or more equations with the same variables, and that the solution is the point where the lines cross. Students solve systems by graphing, substitution, and elimination, and graph single linear inequalities on the coordinate plane. In terms of life skill integration, systems of equations and inequalities can help students compare options, understand limits, and make decisions.

Unit 6 BIG IDEA

When two lines cross, that point is the one solution that works for both equations. We can find it by graphing, substitution, or elimination.

Learning Standards

NJSLS Math:

A.CED Creating Equations

A.CED.A Creating Equations that describe numbers or relationships

A.REI Reasoning with Equations and Inequalities

A.REI.C Solve systems of equations

6. Solve systems of linear equations algebraically (include using the elimination method) and graphically, focusing on pairs of linear equations in two variables.

Algebra 1 Limits and Clarifications: Limited to 2×2 systems and have a real-world context.

A.REI.D Represent and solve equations and inequalities graphically

11. Explain why the x-coordinates of the points where the graphs of two equations intersect are the solutions of the equation; find the solutions approximately using technology to graph, make tables of values, or find successive approximations.

12. Graph the solutions to a linear inequality in two variables as a half plane (excluding the boundary in the case of a strict inequality)

Standards for Mathematical Practice

1. Make sense of problems and persevere in solving them
2. Reason abstractly and quantitatively
3. Construct viable arguments and critique the reasoning of others
4. Model with mathematics
5. Use appropriate tools strategically
6. Attend to precision
7. Look for and make use of structure
8. Look for and express regularity in repeated reasoning

Interdisciplinary Connections

Career Readiness, Life Literacies, & Key Skills (CLKS):

9.4.12.CI.1 Demonstrate the ability to reflect, analyze, and use creative skills and ideas.

9.4.12.CT.2: Explain the potential benefits of collaborating to enhance critical thinking and problem solving

9.4.12.TL.1: Assess digital tools based on features such as accessibility options, capacities, and utility for accomplishing a specified task.

9.4.12.TL.3 Analyze the effectiveness of the process and quality of collaborative environments.

Computer Science & Design Thinking (CS & DT):

8.1.12.CS.4: Develop guidelines that convey systematic troubleshooting strategies that others can use to identify and fix errors.

8.1.12.DA.5: Create data visualizations from large data sets to summarize, communicate, and support different interpretations of real-world phenomena.

8.2.12.NT.1: Explain how different groups can contribute to the overall design of a product.

Learning Targets

Unit Essential Questions:	**Unit Enduring Understandings:**
• How are systems of equations useful in the real world? • What does the solution to a system of linear equations represent, and how can it be found?	• A system of linear equations consists of two or more linear equations with the same variables, and the solution is the point where the graphs intersect. • There are multiple methods for solving systems of linear equations, including graphing, substitution, and elimination.

Vocabulary: Consistent, Dependent, Elimination, Inconsistent, Independent, Substitution, System of equations

Students Will Be Able To:

- Solve systems of equations by graphing *[6-1]*
- Solve systems of equations by using substitution *[6-2]*
- Solve systems of equations by elimination with addition or subtraction *[6-3]*
- Graph a linear inequality on the coordinate plane *[6-5]*

Learning Activities:

- Reveal online practice based on each lesson (Launch → Explore → Learn/Examples → Check → Exit Ticket → Practice), scaffolded and differentiated for LLD learners.
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- Small group instruction, small group intervention, and re-teach stations; teacher-created visual notes, reference sheets, and step-by-step cue cards.
- Manipulatives and visual/concrete models before moving to abstract representations.
- Communicators (mini whiteboards) and low-stakes checks for understanding throughout each lesson.
- LLD learning activities: identifying variables, comparing job offers, gym memberships, transportation costs by graphing. Use substitution to grocery shop and budget money. Use elimination for event planning and shopping. Graph linear inequalities for a shopping budget and employment hours. Apartment budgeting challenge, CBI as appropriate

Assessment Evidence

Formative Assessments: Quizzes, Warm-Ups, Exit Passes, Communicators, Classwork

Summative Assessments: Cumulative Assessments (modified format, reduced item count, visual supports)

Common Benchmark Assessments: Common Unit Assessments, LinkIt! Benchmarks (accommodated per IEP)

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Students at Risk of Failure:

Home/school connection; alternative assessments; learning contracts; homogeneous grouping; supplemental instruction; think-pair-share by readiness; homework options; differentiated online practice; leveled rubrics; tiered levels of support; tiered activities; small group instruction; work-alone or group-work choice; opportunities for make-up work or reduced number of assignments; access to extra help when possible.

Students with 504 Plans:

Teachers are responsible for implementing designated services and strategies identified on a student's 504 Plan. 504 plans are formal plans that schools develop to give students the support they need and cover any condition that limits daily activities in a major way. Students' accommodations are outlined in their individual 504 plan.

Specific Strategies and Practices that Support Gifted & Talented Students:

Homogeneous grouping; small group in-depth instruction; differentiated online practice; alternative assessments; pre-assess to provide differentiated instruction to accelerate learning; alternate or reduced work within ALEKS, ConnectEd, DeltaMath, and Link It assignments.

Unit 7

Desired Results

Unit 7: Polynomials

Unit Summary: Students learn that a polynomial is an expression with multiple terms, and that the same rules for combining like terms and using the distributive property apply, just with more terms to track. Students add, subtract, and multiply polynomials, and factor out a greatest common factor and simple trinomials. Special focus will be made to practical calculations, decision making, organization, problem solving, and following multi-step procedures.

Unit 7 BIG IDEA

A polynomial is an expression with more than one term. We add, subtract, and multiply polynomials the same way we work with any expression — just with more terms to keep organized.

Learning Standards

NJSLS Math:

A.SSE Seeing Structure in Expressions

A.SSE.A Interpret the structure of expressions

1a. Interpret parts of an expression, such as terms, factors, and coefficients.

2. Use the structure of an expression to identify ways to rewrite it

A.APR Arithmetic with Polynomials and Rational Expressions

A.APR.A Perform arithmetic operations on polynomials

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.

Standards for Mathematical Practice

1. Make sense of problems and persevere in solving them
2. Reason abstractly and quantitatively
3. Construct viable arguments and critique the reasoning of others
4. Model with mathematics
5. Use appropriate tools strategically
6. Attend to precision
7. Look for and make use of structure
8. Look for and express regularity in repeated reasoning

Interdisciplinary Connections

Career Readiness, Life Literacies, & Key Skills (CLKS):

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9.4.12.CT.2: Explain the potential benefits of collaborating to enhance critical thinking and problem solving

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9.4.12.TL.3 Analyze the effectiveness of the process and quality of collaborative environments.

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8.1.12.DA.5: Create data visualizations from large data sets to summarize, communicate, and support different interpretations of real-world phenomena.

8.2.12.NT.1: Explain how different groups can contribute to the overall design of a product.

Learning Targets

Unit Essential Questions:	**Unit Enduring Understandings:**
• How can you perform operations on polynomials and use them to represent real-life situations? • What does the degree of a polynomial tell us?	• Understanding the degree of a polynomial helps classify and analyze its behavior. • Polynomial functions can model a variety of real-world phenomena with nonlinear relationships.

Vocabulary: Binomial, Degree of monomial, Degree of polynomial, Leading coefficient, Polynomials, Standard form of a polynomial, Trinomial, Factoring, Quadratic expression

Students Will Be Able To:

- Add and subtract polynomials by combining like terms *[8-1]*
- Multiply polynomials by monomials *[8-2]*
- Multiply polynomials by polynomials *[8-3]*
- Factor polynomials by applying the distributive property (GCF) *[8-5]*
- Factor simple trinomials (a = 1) into two binomials *[8-6]*

Learning Activities:

- Reveal online practice based on each lesson (Launch → Explore → Learn/Examples → Check → Exit Ticket → Practice), scaffolded and differentiated for LLD learners.
- ALEKS platform for individualized, self-paced skill practice based on knowledge-check results.
- Small group instruction, small group intervention, and re-teach stations; teacher-created visual notes, reference sheets, and step-by-step cue cards.
- Manipulatives and visual/concrete models before moving to abstract representations.
- Communicators (mini whiteboards) and low-stakes checks for understanding throughout each lesson.

- LLD Learning Activities: Combining like terms when shopping, budgeting, and conducting inventory at work. Multiply polynomials when shopping, hours worked with pay, identifying the area of a room, identifying the area of a garden, floor-tile planning. Factor matching, sorting. Home improvement project. Build a personal budget, CBI as appropriate

Assessment Evidence

Formative Assessments: Quizzes, Warm-Ups, Exit Passes, Communicators, Classwork

Summative Assessments: Cumulative Assessments (modified format, reduced item count, visual supports)

Common Benchmark Assessments: Common Unit Assessments, LinkIt! Benchmarks (accommodated per IEP)

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Students at Risk of Failure:

Home/school connection; alternative assessments; learning contracts; homogeneous grouping; supplemental instruction; think-pair-share by readiness; homework options; differentiated online practice; leveled rubrics; tiered levels of support; tiered activities; small group instruction; work-alone or group-work choice; opportunities for make-up work or reduced number of assignments; access to extra help when possible.

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Specific Strategies and Practices that Support Gifted & Talented Students:

Homogeneous grouping; small group in-depth instruction; differentiated online practice; alternative assessments; pre-assess to provide differentiated instruction to accelerate learning; alternate or reduced work within ALEKS, ConnectEd, DeltaMath, and Link It assignments.

Unit 8

Desired Results

Unit 8: Quadratic Functions

Unit Summary: Students learn that a quadratic function graphs as a U-shaped curve called a parabola. Students identify key features (vertex, axis of symmetry) and graph quadratic functions, then solve quadratic equations by graphing, factoring, the square root property, and the quadratic formula (with a reference sheet). Students will use practical problem solving and focus on interpreting graphs, recognizing patterns, and accurately using formulas.

Unit 8 BIG IDEA

A quadratic function graphs as a U-shaped parabola. We can find its key features — like the vertex — and use factoring or the quadratic formula to find where the parabola crosses the x-axis.

Learning Standards

NJSLS Math:

F.IF Interpreting Functions

F.IF.B Interpret functions that arise in applications in terms of the context

4. For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship.

Algebra 1 Limits and Clarifications: Limited to linear functions, quadratic functions, and exponential functions with domains in the integers. Tasks should have a real-world context.

F.IF.C Analyze functions using different representations

7a. Graph linear and quadratic functions and show intercepts, maxima, and minima.

8a. Use the process of factoring in a quadratic function to show zeros and interpret these in terms of a context.

F.BF Building Functions

F.BF.A Build a function that models a relationship between two quantities

F.BF.B Build new functions from existing functions

A.SSE Seeing Structure in Expressions

A.SSE.B Write expressions in equivalent forms to solve problems

3a. Factor a quadratic expression to reveal the zeros of the function it defines.

A.REI Reasoning with Equations and Inequalities

A.REI.B Solve equations and inequalities in one variable

4b. Solve quadratic equations by inspection (e.g., for $x^2 = 49$), taking square roots, the quadratic formula, and factoring, as appropriate to the initial form of the equation.

A.CED Creating Equations

A.CED.A Creating Equations that describe numbers or relationships

1. Create equations and inequalities in one variable and use them to solve problems, including equations arising from quadratic functions.
Algebra 1 Limits and Clarifications: Limited to linear, quadratic and exponential equations with integer exponents.

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

F.LE Linear and Exponential Models
F.LE.A Construct and compare linear and exponential models and solve problems

Standards for Mathematical Practice

1. Make sense of problems and persevere in solving them
2. Reason abstractly and quantitatively
3. Construct viable arguments and critique the reasoning of others
4. Model with mathematics
5. Use appropriate tools strategically
6. Attend to precision
7. Look for and make use of structure
8. Look for and express regularity in repeated reasoning

Interdisciplinary Connections

Career Readiness, Life Literacies, & Key Skills (CLKS):

9.4.12.CI.1 Demonstrate the ability to reflect, analyze, and use creative skills and ideas.

9.4.12.CT.2: Explain the potential benefits of collaborating to enhance critical thinking and problem solving

9.4.12.TL.1: Assess digital tools based on features such as accessibility options, capacities, and utility for accomplishing a specified task.

9.4.12.TL.3 Analyze the effectiveness of the process and quality of collaborative environments.

Computer Science & Design Thinking (CS & DT):

8.1.12.CS.4: Develop guidelines that convey systematic troubleshooting strategies that others can use to identify and fix errors.

8.1.12.DA.5: Create data visualizations from large data sets to summarize, communicate, and support different interpretations of real-world phenomena.

8.2.12.NT.1: Explain how different groups can contribute to the overall design of a product.

Learning Targets

Unit Essential Questions:	Unit Enduring Understandings:
• Why is it helpful to have different methods to solve quadratic equations?	• Quadratic functions can be modeled and represented in multiple forms, each providing different insight into the function.

• What does the vertex of a quadratic function tell us about its graph and real-world meaning?	• Quadratic functions model many real-world phenomena, such as projectile motion and area problems.

Vocabulary: Axis of symmetry, Maximum, Minimum, Parabola, Quadratic equation, Quadratic function, Standard form of a quadratic function, Vertex form

Students Will Be Able To:

- Analyze and graph quadratic functions *[9-1]*
- Write quadratic equations and solve them by graphing *[9-3]*
- Solve quadratic equations by factoring and using the square root property *[9-4]*
- Solve quadratic equations by using the quadratic formula (with reference sheet) *[9-6]*

Learning Activities:

- Reveal online practice based on each lesson (Launch → Explore → Learn/Examples → Check → Exit Ticket → Practice), scaffolded and differentiated for LLD learners.
- ALEKS platform for individualized, self-paced skill practice based on knowledge-check results.
- Small group instruction, small group intervention, and re-teach stations; teacher-created visual notes, reference sheets, and step-by-step cue cards.
- Manipulatives and visual/concrete models before moving to abstract representations.
- Communicators (mini whiteboards) and low-stakes checks for understanding throughout each lesson.
- LLD Learning Activities: basketball shot graph, water fountain challenge, quadratic graph matching, vertex identification, situational equations, reading and interpreting graphs, area model practice, CBI as appropriate

Assessment Evidence

Formative Assessments: Quizzes, Warm-Ups, Exit Passes, Communicators, Classwork

Summative Assessments: Cumulative Assessments (modified format, reduced item count, visual supports)

Common Benchmark Assessments: Common Unit Assessments, LinkIt! Benchmarks (accommodated per IEP)

Alternative Assessments: Modified Unit Assessments, Modified Projects, Other Modified Assessments

Core Instructional & Supplemental Materials

Math Program: McGraw Hill ConnectEd - Reveal Algebra 1 (modified/foundational lessons), ALEKS (Assessment and Learning in Knowledge Spaces)

DeltaMath, Khan Academy, Desmos, Graphing Calculators, manipulatives and visual models, teacher-created scaffolded notes and reference sheets

LinkIt! Benchmarks, LinkIt! Test Bank

Accommodations and Modifications:
Students with Disabilities, English Language Learners, Students at Risk of Failure, Students with 504s, Gifted & Talented Students

Specific Strategies and Practices that Support Students with Disabilities:

Students receiving Special Education programming have specific goals and objectives, as well as accommodations and modifications outlined within their Individualized Education Plans (IEP) due to an identified disability and/or diagnosis. In addition to exposure to the general education curriculum, the instruction is differentiated based upon the student's needs. The IEP acts as a supplemental curriculum guide inclusive of instructional strategies that support each learner.

Small group/one-to-one instruction; additional time; review and restate directions; movement/sensory breaks; extra visual and verbal cues and prompts; preferential seating; consistent daily routine; chunked/scaffolded steps; graphic organizers and reference sheets (formula banks, step-by-step cue cards); manipulatives and visual models; checklists; immediate and frequent feedback; frequent comprehension checks; reduced number of problems per practice set; alternate or reduced work within ALEKS, ConnectEd, DeltaMath, and Link It assignments.

Specific Strategies and Practices that Support English Language Learners:

English language learner (ELL) is a national-origin-minority student who is limited-English-proficient. This term is often preferred over limited-English-proficient (LEP) as it highlights accomplishments rather than deficits.

Pre-teaching of vocabulary and concepts; personal glossary/word bank with visuals; extended time; simplified/verbal instructions; frequent breaks; visual learning, including graphic organizers; use of cognates to increase comprehension; teacher modeling; pairing students with beginning English language skills with students who have more advanced English language skills; scaffolding; word walls; think-pair-share; cooperative learning groups; alternate or reduced work within ALEKS, ConnectEd, DeltaMath, and Link It assignments.

Students at Risk of Failure:

Home/school connection; alternative assessments; learning contracts; homogeneous grouping; supplemental instruction; think-pair-share by readiness; homework options; differentiated online practice; leveled rubrics; tiered levels of support; tiered activities; small group instruction; work-alone or group-work choice; opportunities for make-up work or reduced number of assignments; access to extra help when possible.

Students with 504 Plans:

Teachers are responsible for implementing designated services and strategies identified on a student's 504 Plan. 504 plans are formal plans that schools develop to give students the support they need and cover any condition that limits daily activities in a major way. Students' accommodations are outlined in their individual 504 plan.

Specific Strategies and Practices that Support Gifted & Talented Students:

Homogeneous grouping; small group in-depth instruction; differentiated online practice; alternative assessments; pre-assess to provide differentiated instruction to accelerate learning; alternate or reduced work within ALEKS, ConnectEd, DeltaMath, and Link It assignments.