

Glen Ridge Public Schools –Mathematics Curriculum



Course Title: Algebra I Grade 8

Subject: Mathematics

Grade Level: 8th Grade

Duration: 1 Academic School Year

Prerequisite: Completion of Advanced Pre-Algebra 7 with a grade of “B” or better, teacher recommendation, and completion of the summer assignment

Elective or Required: Required

Mathematics Mission Statement

Mathematics is an integral part of our lives. Students must be actively involved in their mathematics education through the use of modeling and demonstrating the ability to persevere through problem solving. The mathematics curricula will emphasize critical thinking skills through a balance of logic and reasoning, attention to precision by utilizing patterns and structure, and bridging these ideas to cross-curricular learning. Students will be engaged and challenged in a student-centered learning environment that is developmentally appropriate and will communicate mathematical ideas, both in a verbal and written form. Through effectively applying hands-on manipulatives, basic computation skills and the use of technical writing to justify their processes, students will critique the work of themselves and others.

Course Description:

Advanced Algebra I is an above-grade level advanced math course. Students are expected to enter this course fluent in their ability to complete operations with rational numbers (decimals, fractions, percents, integers) without a calculator. Algebra is a basic course for all college preparatory mathematics courses. Instructional emphasis will be placed on modeling real-life situations with linear and non-linear functions. In addition, students will explore functions as they represent real-world phenomena in the form of tables, equations and graphs through the use of technology.

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Algebra I 8th Grade

Unit 1: Introduction to Algebra

Approximate # Of Weeks: 3 Weeks

Essential Questions:

- What are the similarities and differences between precision and accuracy?
- How do you simplify expressions? How do you determine when terms are considered *like*?
- How do you interpret an algebraic expression? How do you write an algebraic expression?
- How do you solve an equation in one variable?
- How do you solve an equation for one variable when there are multiple variables in the equation?
- What does the absolute value represent?
- How do you solve an absolute value equation?
- How do you solve an inequality? How do you solve a compound inequality?
- How do you solve an absolute value inequality?

New Jersey Student Learning Standards: N-RN.B.3, A-SSE.A.1, A-SSE.A.2, A-SSE.B.3, NCTM Mathematical Practices

Upon completion of this unit students will be able to:

- Describe the difference between precision and accuracy.
- Recognize and define the structure of an algebraic expression.
- Simplify algebraic expressions.
- Solve equations and literal equations.
- Solve absolute value equations.
- Solve compound inequalities.
- Solve absolute value inequalities.

Interdisciplinary Standards (njcccs.org)

- Standard 5.1 – Science Practices
- Standard 6.1 – U.S. History: America in the World
- Standard 6.3 – Active Citizenship in the 21st Century
- Standard 8.1 – Computer and Information Literacy
- Standard 8.2 – Technology Education
- Standard 9.1 – 21st - Century Life & Career Skills

Activities – include 21st Century Technologies:

- Daily guided notes/cooperative activities for each lesson (see Appendix A for sequence)
- Group work on lesson practice
- Desmos Graphing Lab
- Math XL video tutorials

- Google Classroom
- KhanAcademy Mission
- Graded Classwork Summative Assessments

Enrichment Activities:

- Challenge Problems
- Problem Solving Worksheets
- Concept Tasks

Methods of Assessments/Evaluation:

- Entry/Exit slips and scales
- Student reflection
- Math Chat
- K-W-L Graphic Organizer
- Homework (Math XL)
- Concept Tasks (Real World Analogies)
- Graded Classwork Summative Assessments
- Quizzes
- Marking Period Project
- Quarterly Assessment

Resources/Including Online Resources

- Math XL
- Google Classroom
- KhanAcademy Mission
- Selected Websites (See Appendix B)

Unit 2: Functions

Approximate # Of Weeks: 3 Weeks

Essential Questions:

- How do you define an independent variable? A dependent variable?
- How do independent and dependent variables relate?
- What are the differences between relations and functions?
- How do you determine when a relation is a function?
- How do you determine the domain of a relation/function?
- How do you determine the range of a relation/function?
- What is the difference between a discrete function and a continuous function?
- What is the purpose of using function notation?
- What does the visual representation of a linear function represent?
- What does the visual representation of a linear inequality represent?
- What does the visual representation of an absolute value function represent?

- What does the visual representation of a piecewise function represent?

New Jersey Student Learning Standards: A-SSE.A.1, A-SSE.A.2, F-IF.A.1, F-IF.A.2, F-IF.B.4, F-IF.B.5, F-IF.B.6, F-IF.B.7, F-IF.C.8, F-IF.C.9, G-CO.A.2, NCTM Mathematical Practices

Upon completion of this unit students will be able to:

- Define and identify the independent and dependent variables of a function.
- Classify a relation as a function.
- Determine the domain and range of a relation/function.
- Describe the structure of a discrete and a continuous function.
- Use function notation.
- Determine the value of a composite function.
- Graph linear functions, linear inequalities, absolute value functions, and piecewise functions.

Interdisciplinary Standards (njcccs.org)

- Standard 5.1 – Science Practices
- Standard 6.1 – U.S. History: America in the World
- Standard 6.3 – Active Citizenship in the 21st Century
- Standard 8.1 – Computer and Information Literacy
- Standard 8.2 – Technology Education
- Standard 9.1 – 21st - Century Life & Career Skills

Activities – include 21st Century Technologies:

- Daily guided notes/cooperative activities for each lesson (see Appendix A for sequence)
- Group work on lesson practice
- Domain & Range Matching Activity
- Desmos Graphing Lab
- Cut & Paste Piecewise Activity
- Math XL video tutorials
- Google Classroom
- KhanAcademy Mission
- Graded Classwork Summative Assessments

Enrichment Activities:

- Challenge Problems
- Problem Solving Worksheets
- Concept Tasks

Methods of Assessments/Evaluation:

- Entry/Exit slips and scales
- Student reflection
- Math Chat

- K-W-L Graphic Organizer
- Homework (Math XL)
- Concept Tasks (Real World Analogies)
- Graded Classwork Summative Assessments
- Quizzes
- Marking Period Project
- Quarterly Assessment

Resources/Including Online Resources

- Math XL
- Google Classroom
- KhanAcademy Mission
- Selected Websites (See Appendix B)

Unit 3: Rational Exponents & Radicals

Approximate # Of Weeks: 4 Weeks

Essential Questions:

- How do you simplify expressions containing exponents?
- What does a radical represent?
- What is a rational exponent? How do you simplify expressions with rational exponents?
- How do you evaluate a radical expression?
- How do you completely simplify a square root?
- How do you simplify a radical with an index higher than 2?
- Why can a simplified expression not contain a radical in the denominator?
- How do you rationalize a radical expression?

New Jersey Student Learning Standards: N-RN.A.1, N-RN.A.2, N-RN.B.3, A-SSE.A.1a, A-SSE.B.3, F-IF.A.1, F-IF.A.2, F-IF.A.3, F-IF.B.4, F-IF.B.5, F-IF.B.6, F-IF.B.7, F-IF.C.8, F-IF.C.9, G-CO.A.2, NCTM Mathematical Practices

Upon completion of this unit students will be able to:

- Multiply and divide powers with integer exponents.
- Simplify powers of products and quotients with integer exponents.
- Evaluate square roots and cube roots.
- Find the square root of a decimal.
- Determine 5th roots.
- Classify rational expressions.
- Rewrite roots as rational exponents.
- Solve an exponential equation with a rational solution.
- Simplify the quotient of powers with rational exponents.
- Simplify mixed radical and exponential expressions.

- Evaluate fractional exponents.
- Evaluate fractional exponents with negative unit-fractions.
- Evaluate fractional exponents with fractional bases.
- Evaluate quotients of fractional exponents.
- Evaluate mixed radicals and exponents.
- Simplify square roots with and without variables.
- Simplify square root, cube root, and higher-root expressions.

Interdisciplinary Standards (njcccs.org)

- Standard 5.1 – Science Practices
- Standard 6.1 – U.S. History: America in the World
- Standard 6.3 – Active Citizenship in the 21st Century
- Standard 8.1 – Computer and Information Literacy
- Standard 8.2 – Technology Education
- Standard 9.1 – 21st - Century Life & Career Skills

Activities – include 21st Century Technologies:

- Daily guided notes/cooperative activities for each lesson (see Appendix A for sequence)
- Group work on lesson practice
- Simplifying Expressions Puzzle
- Math XL video tutorials
- Google Classroom
- KhanAcademy Mission
- Graded Classwork Summative Assessments

Enrichment Activities:

- Challenge Problems
- Problem Solving Worksheets
- Concept Tasks

Methods of Assessments/Evaluation:

- Entry/Exit slips and scales
- Student reflection
- Math Chat
- K-W-L Graphic Organizer
- Homework (Math XL)
- Concept Tasks (Real World Analogies)
- Graded Classwork Summative Assessments
- Quizzes
- Marking Period Project
- Quarterly Assessment

Resources/Including Online Resources

- Math XL
- Google Classroom
- KhanAcademy Mission
- Selected Websites (See Appendix B)

Unit 4: Exponential Functions

Approximate # Of Weeks: 3 Weeks

Essential Questions:

- How do we apply explicit expressions/a recursive process to real world situations?
- How do the visual representations and algebraic structures of linear and exponential functions compare?
- How do linear and exponential function compare?
- What is the structure of exponential growth/decay?
- How do you construct the graph of an exponential function?
- How do correlation and causation relate?
- How do you determine the best regression model for a determined set of data?
- How do you calculate and plot residuals?

New Jersey Student Learning Standards: F.IF.A.3, F.IF.B.3, F.IF.C.7, F.BF.1a, F.BF.B.3, F.LE.A.2, F.LE.A.1, F.LE.A.2, F.LE.A.3, F.LE.B.5, A-SSE.B.4, A-SSE.A.1a, A-SSE.B.3, NCTM Mathematical Practices

Upon completion of this unit students will be able to:

- Evaluate a pattern.
- Determine if a sequence is arithmetic or geometric.
- Write and evaluate the recursive and explicit formulas.
- Compare and contrast linear and exponential functions.
- Graph exponential growth and decay functions.
- Determine when events represent causation or correlation.
- Graph and define the correlation of scatterplots.
- Determine the best regression model for a set of data using the correlation coefficient.
- Calculate and plot residuals.

Interdisciplinary Standards (njcccs.org)

- Standard 5.1 – Science Practices
- Standard 6.1 – U.S. History: America in the World
- Standard 6.3 – Active Citizenship in the 21st Century
- Standard 8.1 – Computer and Information Literacy
- Standard 8.2 – Technology Education
- Standard 9.1 – 21st - Century Life & Career Skills

Activities – include 21st Century Technologies:

- Daily guided notes/cooperative activities for each lesson (see Appendix A for sequence)
- Group work on lesson practice
- Exponential Growth and Decay Penny Activity
- Desmos Graphing Activity
- Correlation vs. Causation Gallery Walk
- Scatterplots Lab TI-84
- Real World Analogies Activity
- Math XL video tutorials
- Google Classroom
- KhanAcademy Mission
- Graded Classwork Summative Assessments

Methods of Assessments/Evaluation:

- Entry/Exit slips and scales
- Student reflection
- Math Chat
- K-W-L Graphic Organizer
- Homework (Math XL)
- Concept Tasks (Real World Analogies)
- Graded Classwork Summative Assessments
- Quizzes
- Marking Period Project
- Quarterly Assessment

Resources/Including Online Resources

- Math XL
- Google Classroom
- KhanAcademy Mission
- Selected Websites (See Appendix B)

Unit 5: Polynomials & Factoring

Approximate # Of Weeks: 3 Weeks

Essential Questions:

- What is the structure of a polynomial expression?
- Can you classify a polynomial by the number of terms? Degree?
- How do you add, subtract and multiply polynomials?
- What are the special products of binomials?
- How do you factor a polynomial using its structure?

New Jersey Student Learning Standards: N.RN.1, N.RN.2, N.RN.3, A.APR.1, A.SSE.1, A.SSE.2, A.SSE.3, NCTM Mathematical Practices

Upon completion of this unit students will be able to:

- Identify the structure of a polynomial expressions.
- Classify a polynomial by degree and the number of terms.
- Add, subtract, and multiply polynomials.
- Use the structure of special products to recognize the structure of their products.
- Factor polynomials by recognizing its structure.

Interdisciplinary Standards (njcccs.org)

- Standard 5.1 – Science Practices
- Standard 6.1 – U.S. History: America in the World
- Standard 6.3 – Active Citizenship in the 21st Century
- Standard 8.1 – Computer and Information Literacy
- Standard 8.2 – Technology Education
- Standard 9.1 – 21st - Century Life & Career Skills

Activities – include 21st Century Technologies:

- Daily guided notes/cooperative activities for each lesson (see Appendix A for sequence)
- Group work on lesson practice
- Algebra Tiles Factoring Lab
- Factoring Relay
- Factoring Graphic Organizer
- Math XL video tutorials
- Google Classroom
- KhanAcademy Mission
- Graded Classwork Summative Assessments

Methods of Assessments/Evaluation:

- Entry/Exit slips and scales
- Student reflection
- Math Chat
- K-W-L Graphic Organizer
- Homework (Math XL)
- Concept Tasks (Real World Analogies)
- Graded Classwork Summative Assessments
- Quizzes
- Marking Period Project
- Quarterly Assessment

Resources/Including Online Resources

- Math XL

- Google Classroom
- KhanAcademy Mission
- Selected Websites (See Appendix B)

Unit 6: Quadratic Functions & Equations

Approximate # Of Weeks: 8 Weeks

Essential Questions:

- How do identify quadratic functions and their maximum or minimum?
- How do we identify the zero of a function?
- How do you graph a quadratic function with the use of a table?
- How do the values of a , b , and c in the standard form of a quadratic affect the graph of the parent function, $y = ax^2 + bx + c$?
- How do you graph a quadratic using transformations?
- What are the solutions of a quadratic equation?
- How can we rewrite an equation so it is factorable?
- How can you convert a quadratic equation in standard form to vertex form?

New Jersey Student Learning Standards: N.RN.1, N.RN.2, N.RN.3, A.APR.1, A.APR.3, A.REI.1, A.REI.4, A.REI.7, A.REI.10, A.REI.11, A.CED.1, A.CED.2, A.CED.3, A.SSE.1, A.SSE.2, A.SSE.3, F.IF.4, F.IF.7, F.IF.8, F.BF.3, NCTM Mathematical Practices

Upon completion of this unit students will be able to:

- Identify quadratic functions and determine whether they have a minimum or maximum.
- Graph a quadratic function and give its domain and range.
- Find the zeros of a quadratic function from its graph.
- Find the axis of symmetry and the vertex of a parabola.
- Graph a quadratic function in the form $y = ax^2 + bx + c$.
- Graph and transform quadratic functions.
- Solve quadratic equations by graphing.
- Solve quadratic equations by factoring.
- Solve quadratic equations by completing the square.
- Solve quadratic equations by using the Quadratic Formula.
- Determine the number of solutions of a quadratic equations by using the discriminant.
- Write quadratic equations in vertex form given standard form.
- Write quadratic equations given transformations.
- Write quadratic equations given the vertex and a point.
- Write quadratic equations given the zeros and a point.
- Solve systems of equations in two variables in which one equation is linear and the other is quadratic.
- Recognize and graph cubic functions.

- Solve cubic equations.

Interdisciplinary Standards (njcccs.org)

- Standard 5.1 – Science Practices
- Standard 6.1 – U.S. History: America in the World
- Standard 6.3 – Active Citizenship in the 21st Century
- Standard 8.1 – Computer and Information Literacy
- Standard 8.2 – Technology Education
- Standard 9.1 – 21st - Century Life & Career Skills

Activities – include 21st Century Technologies:

- Daily guided notes/cooperative activities for each lesson (see Appendix A for sequence)
- Group work on lesson practice
- Solving Quadratics Relay
- Transforming Quadratics Applet (<http://analyzemath.com/quadraticg/quadraticg.htm>)
- Algebra Tiles - Factoring and Completing the Square Labs
- The Family of Quadratics TI-84 Calculator Lab
- Solving Quadratics Graphic Organizer
- Math XL video tutorials
- Google Classroom
- KhanAcademy Mission
- Graded Classwork Summative Assessments

Methods of Assessments/Evaluation:

- Entry/Exit slips and scales
- Student reflection
- Math Chat
- K-W-L Graphic Organizer
- Homework (Math XL)
- Concept Tasks (Real World Analogies)
- Graded Classwork Summative Assessments
- Quizzes
- Marking Period Project
- Quarterly Assessment

Resources/Including Online Resources

- Math XL
- Google Classroom
- KhanAcademy Mission
- Selected Websites (See Appendix B)

Unit 7: Graphing & Writing Functions

Approximate # Of Weeks: 3 Weeks

Essential Questions:

- How do you utilize the structure of a function to graph it?
- How do you convert between standard and vertex form of a quadratic function?
- Why it is useful to convert between standard and vertex form of a quadratic function?
- How do you write functions given their visual representations?

New Jersey Student Learning Standards:

Upon completion of this unit students will be able to:

- Graph functions.
- Convert between standard and vertex form of a quadratic function.
- Write the function given its visual representation.

Interdisciplinary Standards (njcccs.org)

- Standard 5.1 – Science Practices
- Standard 6.1 – U.S. History: America in the World
- Standard 6.3 – Active Citizenship in the 21st Century
- Standard 8.1 – Computer and Information Literacy
- Standard 8.2 – Technology Education
- Standard 9.1 – 21st - Century Life & Career Skills

Activities – include 21st Century Technologies:

- Daily guided notes/cooperative activities for each lesson (see Appendix A for sequence)
- Group work on lesson practice
- Functions Graphic Organizer
- Functions Matching Activity
- Math XL video tutorials
- Google Classroom
- KhanAcademy Mission
- Graded Classwork Summative Assessments

Methods of Assessments/Evaluation:

- Entry/Exit slips and scales
- Student reflection
- Math Chat
- K-W-L Graphic Organizer
- Homework (Math XL)
- Concept Tasks (Real World Analogies)
- Graded Classwork Summative Assessments
- Quizzes
- Marking Period Project

- Quarterly Assessment

Resources/Including Online Resources

- Math XL
- Google Classroom
- KhanAcademy Mission
- Selected Websites (See Appendix B)

Unit 8: Linear vs. Quadratic

Approximate # Of Weeks: 2 Weeks

Essential Questions:

- How do we use set notation to classify the domain and range of a function?
- How do we use interval notation to classify the domain and range of a function?
- How do the graphs of linear inequalities and quadratic inequalities relate?
- How do you use quadratic functions to model, analyze and predict data?
- How do you solve a system containing lines and quadratic equations?

New Jersey Student Learning Standards: F.BF.3, F.IF.5, F.IF.7, A.CED.1, A.CED.2, A.CED.3, NCTM Mathematical Practices

Upon completion of this unit students will be able to:

- Use set notation to classify the domain and range.
- Use interval notation to classify domain and range.
- Graph linear inequalities.
- Graph quadratic inequalities.
- Use a calculator to fit a curve for a quadratic function.
- Graph systems of linear and quadratic equations.
- Solve systems of quadratic equations.

Interdisciplinary Standards (njcccs.org)

- Standard 5.1 – Science Practices
- Standard 6.1 – U.S. History: America in the World
- Standard 6.3 – Active Citizenship in the 21st Century
- Standard 8.1 – Computer and Information Literacy
- Standard 8.2 – Technology Education
- Standard 9.1 – 21st - Century Life & Career Skills

Activities – include 21st Century Technologies:

- Daily guided notes/cooperative activities for each lesson (see Appendix A for sequence)
- Group work on lesson practice
- Table Sort of Interval Notation Activity

- Center Unit Review
- Math XL video tutorials
- Google Classroom
- KhanAcademy Mission
- Graded Classwork Summative Assessments

Methods of Assessments/Evaluation:

- Entry/Exit slips and scales
- Student reflection
- Math Chat
- K-W-L Graphic Organizer
- Homework (Math XL)
- Concept Tasks (Real World Analogies)
- Graded Classwork Summative Assessments
- Quizzes
- Marking Period Project
- Quarterly Assessment

Resources/Including Online Resources

- Math XL
- Google Classroom
- KhanAcademy Mission
- Selected Websites (See Appendix B)

Unit 9: Complex Numbers

Approximate # Of Weeks: 3 Weeks

Essential Questions:

- What are complex numbers used for?
- How do we perform operations with complex numbers?
- How do we represent complex numbers in the coordinate plane?
- How do we use complex numbers in the real world?

New Jersey Student Learning Standards: N.CN.1, N.CN.2, N.CN.7, A.CED.1, NCTM Mathematical Practices

Upon completion of this unit students will be able to:

- Simplify complex numbers.
- Solve quadratic equations with complex number solutions.
- Find complex conjugates.
- Perform operations with complex numbers.
- Evaluate powers of i .

- Graph complex numbers on a coordinate plane.
- Calculate the absolute value of complex numbers.

Interdisciplinary Standards (njcccs.org)

- Standard 5.1 – Science Practices
- Standard 6.1 – U.S. History: America in the World
- Standard 6.3 – Active Citizenship in the 21st Century
- Standard 8.1 – Computer and Information Literacy
- Standard 8.2 – Technology Education
- Standard 9.1 – 21st - Century Life & Career Skills

Activities – include 21st Century Technologies:

- Daily guided notes/cooperative activities for each lesson (see Appendix A for sequence)
- Group work on lesson practice
- Communicator/WhiteBoard Activity
- Application Review
- Math XL video tutorials
- Google Classroom
- KhanAcademy Mission
- Graded Classwork Summative Assessments

Methods of Assessments/Evaluation:

- Entry/Exit slips and scales
- Student reflection
- Math Chat
- K-W-L Graphic Organizer
- Homework (Math XL)
- Concept Tasks (Real World Analogies)
- Graded Classwork Summative Assessments
- Quizzes
- Marking Period Project
- Quarterly Assessment

Resources/Including Online Resources

- Math XL
- Google Classroom
- KhanAcademy Mission
- Selected Websites (See Appendix B)

Unit 10: Operations with Polynomials

Approximate # Of Weeks: 3 Weeks

Essential Questions:

- How do we find the product of polynomials?
- How do we find the quotient of polynomials?
- How do we find the quotient of polynomials using synthetic division?
- How do you factor polynomials with a degree higher than a quadratic?

New Jersey Student Learning Standards: F.IF.7, A.APR.1, A.APR.2, A.APR.4, A.APR.5, A.APR.6, A.CED.2, A.CED.3, NCTM Mathematical Practices

Upon completion of this unit students will be able to:

- Multiply polynomials using distribution.
- Multiply polynomials by expanding powers.
- Divide polynomials using long division.
- Divide polynomials using synthetic division.
- Determine if a polynomial is a factor.
- Factor cubic functions by grouping.
- Factor using the sum or difference of cubes.

Interdisciplinary Standards (njcccs.org)

- Standard 5.1 – Science Practices
- Standard 6.1 – U.S. History: America in the World
- Standard 6.3 – Active Citizenship in the 21st Century
- Standard 8.1 – Computer and Information Literacy
- Standard 8.2 – Technology Education
- Standard 9.1 – 21st - Century Life & Career Skills

Activities – include 21st Century Technologies:

- Daily guided notes/cooperative activities for each lesson (see Appendix A for sequence)
- Group work on lesson practice
- Polynomial Review Centers
- Polynomial Multiplication and Division Practice
- Math XL video tutorials
- Google Classroom
- KhanAcademy Mission
- Graded Classwork Summative Assessments

Methods of Assessments/Evaluation:

- Entry/Exit slips and scales
- Student reflection
- Math Chat
- K-W-L Graphic Organizer
- Homework (Math XL)
- Concept Tasks (Real World Analogies)

- Graded Classwork Summative Assessments
- Quizzes
- Marking Period Project
- Quarterly Assessment

Resources/Including Online Resources

- Math XL
- Google Classroom
- KhanAcademy Mission
- Selected Websites (See Appendix B)

Appendix A: Course Sequence

Unit 1 Introduction to Algebra MP1 ~ 3 Weeks

Unit 1A

- Lesson 1 Precision & Accuracy 1.10
- Lesson 2 Expressions & Simplifying 1.1 & 6.1
- Lesson 3 Writing & Interpreting Algebraic Expressions
- Lesson 4 Combining Like Terms

Unit 1B

- Lesson 5 Solving Equations & Literal Equations 1.4 - 1.6
- Lesson 6 Solving Systems of Equations 5.1 - 5.3
- Lesson 7 Solving Absolute Value Equations
- Lesson 8 Solving Inequalities 2.4 - 2.5
- Lesson 9 Solving Compound Inequalities 2.6
- Lesson 10 Solving Absolute Value Inequalities

Unit 2 Functions MP1 ~ 3 Weeks

Unit 2A

- Lesson 1 Independent & Dependent Variables
- Lesson 2 Relations & Functions 3.2
- Lesson 3 Domain & Range
- Lesson 4 Discrete & Continuous
- Lesson 5 Function Notation & Composite Functions

Unit 2B

- Lesson 6 Graphing Linear Functions 3.4
- Lesson 7 Graphing Linear Inequalities 5.5
- Lesson 8 Graphing Absolute Value Functions

Lesson 9 Graphing Piecewise Functions
Lesson 10 Domain & Range of Functions

Unit 3 Rational Exponents & Radicals MP1/2 ~ 4 Weeks

Unit 3A

Lesson 1 Exponent Properties *Review*
Lesson 2 Radicals
Lesson 3 Rational Exponents Intro 6.2
Lesson 4 Properties of Exponents (Rational Exponents) 6.2
Lesson 5 Advanced Exponent & Radical Evaluations

Unit 3B

Lesson 6 Simplifying Square Roots
Lesson 7 Simplifying Radicals (higher index roots)
Lesson 8 Rationalizing Radicals

Unit #4 Exponential Functions MP2 ~ 3 Weeks

Unit 4A

Lesson 1 Function Notation/ Domain & Range Review
Lesson 2 Patterns & Sequences
Lesson 3 Arithmetic & Geometric Sequences/ Recursive & Explicit Formulas
Lesson 4 Linear vs. Exponential Functions
Lesson 5 Exponential Growth & Decay
Lesson 6 Graphing & Comparing Exponential Functions

Unit 4B

Lesson 7 Causation vs. Correlation
Lesson 8 Scatterplots
Lesson 9 Linear/Exponential Regression
Lesson 10 Correlation Coefficients
Lesson 11 Residuals

Unit #5 Polynomials & Factoring MP2 ~ 3 Weeks

Unit 5A

Lesson 1 Polynomials 6.3
Lesson 2 Adding & Subtracting Polynomials 6.4
Lesson 3 Multiplying Polynomials 6.5
Lesson 4 Special Products of Binomials 6.6

Unit 5B

- Lesson 5 Factors & GCF 7.1
- Lesson 6 Factoring Using GCF 7.2
- Lesson 7 Factoring $x^2 + bx + c$ 7.3
- Lesson 8 Factoring $ax^2 + bx + c$ 7.4
- Lesson 9 Factoring Special Products 7.5
- Lesson 10 Choosing a Factoring Method 7.6

Unit #6 Quadratic Functions & Equations MP3 ~ 8 Weeks

Unit 6A Quadratic Functions

- Lesson 1 Identifying Quadratic Functions 8.1
- Lesson 2 Characteristics of Quadratic Functions 8.2
- Lesson 3 Graphing Quadratic Functions 8.3
- The Family of Quadratic Functions LAB
- Lesson 4 Transforming Quadratic Functions 8.4

Unit 6B Solving Quadratic Equations

- Lesson 5 Solving Quadratic Equations by Graphing 8.5
- Explore Roots, Zeros & Intercepts LAB
- Lesson 6 Solving Quadratic Functions by Factoring 8.6
- Lesson 7 Solving Quadratic Functions by Using Square Roots 8.7
- Lesson 8 Completing the Square 8.8
- Lesson 9 The Quadratic Formula & the Discriminant 8.9

Unit 6C Other Functions

- Lesson 10 Nonlinear Systems 8.10
- Lesson 11 Cubic Functions & Equations EXT

Unit 7 Graphing & Writing Functions MP3 ~ 3 Weeks

Unit 7A

- Lesson 1 Graphing Functions *Mixed Review*
- Lesson 2 Changing Between Standard & Vertex Form

Unit 7B

- Lesson 3 Writing Absolute Functions
- Lesson 4 Writing Quadratic Functions
- Lesson 5 Writing Piecewise Functions

Unit 8 Linear vs. Quadratic MP4 ~ 2 Weeks

- Lesson 1 Interval Notation (including Domain & Range)

Lesson 2 Graphing Linear & Quadratic Inequalities
 Lesson 3 Quadratic Regression
 Lesson 4 Linear & Quadratic Systems of Equations

Unit 9 Complex Numbers (Algebra II Textbook) MP4 ~ 3 Weeks

Lesson 1 Complex Numbers & Roots 2.5
 Lesson 2 Complex Operations 2.9
 Lesson 3 Graphing Complex Numbers 2.9
 Lesson 4 Applications of Complex Numbers

Unit 10 Polynomials (Algebra II Textbook) MP4 ~ 3 Weeks

Unit 10A

Lesson 1 Polynomials 3.1
 Lesson 2 Multiplying Polynomials 3.2
 Lesson 3 Dividing Polynomials 3.3

Unit 10B

Lesson 4 Factoring Polynomials 3.4

Holt McDougal Algebra I Common Core Edition 2012 Referenced following lesson

Appendix B: Selected Websites

Website Title	Description	URL
Illustrative Mathematics	Concept tasks divided by domain and substandard.	https://www.illustrativemathematics.org/
Khan Academy	A forum that allows a class to be set-up and progress through a content missions to be monitored.	http://www.khanacademy.org
Virtual Nerd	Video tutorials on mathematics concepts.	http://www.virtual
Math Bits	A website that offers lessons and activities that are challenging in secondary mathematics and computer programming.	http://www.mathbits.com/

Website Title	Description	URL
Shodor	A national resource for computational science education.	http://www.shodor.org/interactivate/activities
Illuminations by NCTM	Activities developed by standard created by the National Council of Teachers of Mathematics.	http://illuminations.nctm.org/Activities.aspx?grade=all
Engage NY	Common core curriculum and applications by grade level.	https://www.engageny.org/resource/grade-7-mathematics https://www.engageny.org/resource/grade-8-mathematics
Brain Pop	Video clips and quizzes on various elementary and middle school concepts.	http://www.brainpop.com/
Quia	A website that allows the teacher to create or search for educational games.	http://www.quia.com/
Desmos	A virtual calculator and graphing tool.	http://www.desmos.com/
Super Teacher Tools	Website that offers tools for teachers such as random name chooser, group makers, seating charts, timers, jeopardy, who wants to be a millionaire, plus other flash games to use for review, plus search pre-made review games to use in the classroom.	http://www.superteachertools.com
Math Open Reference	Website that offers animation of many geometric constructions.	http://www.mathopenref.com/constructions.html
Kahoot	An interactive game site that allows you to search and create a competitive computer engaged game based on specific content.	http://www.kahoot.com