Common Core Algebra I (Levels II & III) Curriculum Guide
2017-2018

Unit 1: Elements of Algebra
- Review use of variables, evaluating & simplifying expressions
- Properties (associative, commutative, identity, inverse, equality, distributive, transitive, substitution principle, closure)
- Writing and solving linear equations
- Solving & Graphing Inequalities include compound inequalities and set notation
- Word Problems
- Literal Equations/Rewriting Formulas

Unit 2: Introduce Functions
- Define and Evaluate Functions
- Function notation
- Sketch/story of a function
- Introduce functions (linear, quadratic, exponential, absolute value, square root, cube root, step, piece-wise)

Unit 3: Graphing & Writing Linear Equations & Inequalities
- Slope (include as rate of change)
- Graphing Using Slope-intercept
- Solving Linear Inequalities by Graphing
- Writing Equations in Standard Form, Slope-intercept Form & Point-Slope Form
- Writing the Equation of a Line Given Certain Information (2 points, // lines, $\perp$ lines, horizontal, vertical)
- Scatterplot & Line of Best Fit (include correlation and causation)
- Arithmetic Sequences

Unit 4: Linear Systems
- Solving by Graphing

- Solving by Substitution
- Solving by Elimination
- Systems of Linear Inequalities
- Word Problems

Unit 5: Exponents
- Laws of Exponents
- Graphing Exponential Functions (Limit to $y = b^x + k$)
- Exponential Growth/Decay
- Scientific Notation
- Geometric Sequences

Unit 6: Polynomials & Factoring
- Polynomials
- Adding & Subtracting Polynomials
- Multiplying Polynomials
- Factoring Polynomials

Unit 7: Solving Quadratics
- Solving by Factoring
- Solving by Graphing (transformations, vertex form, factored form)
- Solving Using Square Roots
- Solving by Completing the Square
- Solving by the Quadratic Formula
- Solving Linear/Quadratic Systems

Unit 8: Rational Algebraic Expressions & Equations
- Simplifying Rational Expressions
- Multiplying & Dividing Rational Expressions
- Adding & Subtracting Rational Expressions
- Solving Rational Equations

Unit 9: Radicals
- Square Roots & Cube Roots
- Operations with Radicals (variables with L3 only)
- Application - Pythagorean Theorem (this is taught in 7th grade)

Unit 10: Additional Functions
- Step and piece-wise functions (defined)
- Functions with transformations (vertical shifts, horizontal shifts, shrink/expand)
- Absolute value, exponential, square root, cubic
- Average rate of change
- Functions and Context

Unit 11: Statistics
- Samples & Populations
- Measures of central tendency
- Single variable statistics (dot plots, histograms, box-and-whisker plot (with outliers)
- Single variable statistics with dispersion (interquartile range and standard deviation)
- 2-variable statistics (scatter plot/linear regression, residuals)
- 2-variable statistics with non-linear behavior
- Correlation

Geometry review prior to state test