HS Course Overview

Content Area: **Mathematics**
Course(s): **Algebra 1**
Time Period: **Year**
Length: **180**
Status: **Published**

Course Overview

Aligned to Standards: 2016 NJSLS

Revision Date: 2023

In compliance with the NJ Student Learning Standards, climate change, career readiness, DEI (Diversity, Equity, & Inclusivity), as well as other standards have been integrated within the NBCRSD curricula (NJ Administrative Code Title 6A: chapter 8; Title 18A: chapter 35).

Course Overview

Sequence- Unit Titles, Summaries, and Number of weeks per unit (total = 18 semester/36 year)

HS Unit 1: Sequences - 3 weeks
In this algebra unit, students explore sequences by creating tables of values, writing equations, and graphing the data with clearly labeled axes. They learn to identify sequences as arithmetic, geometric, or neither by analyzing common differences or ratios, and justify their classifications using mathematical reasoning. Students also develop skills to calculate future terms and apply these concepts to real-life scenarios.

HS Unit 2: Linear & Exponential Functions - 5 weeks
In this Algebra 1 unit, students analyze relationships to determine whether they are linear, exponential, or neither by examining rates of change and identifying key features such as y-intercepts. They learn to write equations in slope-intercept form for linear functions and in standard form for exponential functions based on contextual situations, tables, and graphs. Students apply their understanding by modeling real-life scenarios with both linear and exponential functions, justifying their choices using visual representations, data, and algebraic equations.

HS Unit 3: Data & Modeling - 3 weeks
In this Algebra 1 unit, students explore scatter plots to visually analyze the strength and direction of relationships between two variables, identifying correlations as positive, negative, weak, or strong. They learn to accurately plot data, scale and label axes, and use technology to generate regression equations. Students interpret the slope and y-intercept of the regression line in the context of real-world data, building skills in data analysis and mathematical modeling.

HS Unit 4: One Variable Equations & Inequalities - 3 weeks
In this Algebra 1 unit, students build foundational algebra skills by applying the order of operations to simplify expressions and accurately solve one-variable equations and inequalities with justification. They learn to distinguish between scenarios that model equations versus inequalities and represent solutions visually on number lines. Through contextual problems and practice, students deepen their understanding of symbolic reasoning and mathematical communication.

HS Unit 5: Multi-variable Equations & Inequalities - 4 weeks
In this Algebra 1 unit, students learn to define variables and distinguish between known and unknown quantities in real-world contexts. They develop fluency in rewriting equations to isolate different variables and in writing and graphing linear equations in slope-intercept, point-slope, and

standard form. Students also write and graph two-variable inequalities, using their graphs to identify and interpret possible solutions within the context of a problem.

HS Unit 6: Systems of Equations & Inequalities - 5 weeks
In this Algebra 1 unit, students apply algebraic reasoning to real-world situations by constructing and solving proportions, writing recursive routines, and solving linear equations. They explore and interpret rates of change, solve systems of linear equations using graphing, substitution, and elimination, and represent solutions to both equations and inequalities on graphs. The unit culminates with solving and analyzing systems of linear inequalities to model constraints and possible solutions in real-life contexts.

HS Unit 7: Features of Functions - 3 weeks

In this Algebra 1 unit, students build problem-solving skills by modeling real-life situations using proportions, recursive routines, and linear equations. They explore constant rates of change, solve systems of linear equations through graphing, substitution, and elimination, and apply their understanding to graph and interpret inequalities in one and two variables. The unit culminates with solving systems of linear inequalities, allowing students to analyze and represent multiple constraints in real-world contexts.

HS Unit 8: Quadratic Functions - 3 weeks
In this unit, students develop understanding of quadratic functions by using them to model patterns and real-world contexts, and by examining their rates of change while comparing and contrasting them to linear and exponential functions.

HS Unit 9: Structures of Quadratic Expressions - 5 weeks
In this unit, students explore different forms of writing a quadratic function and how the different forms reveal features of the graph of a quadratic function. Students discover the process for completing the square on a quadratic function and connect it to graphing a parabola, using transformations. They also learn to factor trinomials and to multiply binomials to move between factored and standard forms of quadratic equations, and they learn to use the factored form to find the -intercepts of the graph. Graphs of quadratic functions and different forms of the equation of a quadratic function become the basis for solving quadratic equations. Students connect the factors of a quadratic function to the -intercepts of the graph and to the solution of the equation when . Understanding of the graph of a quadratic function and completing the square are also foundational concepts for the derivation of the quadratic formula.

Reporting Student Progress (link to NB's Assessment System)
All courses follow a balanced assessment system with Practice and Assessments.
Each category includes formative, summative and alternative assessments.

Accommodations and Modifications (link to menu)
Integrated accommodations and modifications for special education students, English language learners, students at risk of school failure, gifted and talented students, and students with 504 plans.