



Mathematics

Course: Honors Algebra 1
High/Middle School: LMS, RMS,
and WOHS

Essential Course Information

- Revised
- Full Year - 5 Credits
- Graduation Requirement

Course Overview

This rigorous course emphasizes the skills, concepts and applications of Algebra I. Topics include: Operations on Numbers and Expressions, Linear Relationships, Non-Linear Relationships, Data Statistics, and Probability. Graphing calculators are used extensively throughout the course. This fast-paced course teaches topics in greater depth and with a focus on applications and connections. This course meets the Mathematics credit requirement for graduation.

Unit	Estimated Class Time	Overview
<u>Unit 1: The Real Number System and Solving Equations</u>	3 Weeks	In this unit, students will solve one-variable equations including equations that require the distributive property and combining like terms, as well as non-integral coefficients. Students will be able to use inverse operations to solve literal equations and will also be able to write and solve algebraic equations to model real world problems. Students will solve absolute value equations and will be able to explain why an absolute value equation can have none, one or two solutions.
<u>Unit 2: Functions</u>	3 Weeks	In this unit, students will move from equations with one variable to exploring relations and functions in two variables. Students will learn to differentiate between functions and relations by analyzing multiple representations of relations. Students will become proficient using function notation and evaluating different types of functions including linear, quadratic, square root, absolute value, cubic and cube root.
<u>Unit 3: Introduction to Function Analysis</u>	4 Weeks	In this unit, students will build on their knowledge of function notation and evaluating functions. Students will graph various function families by creating tables of values and will start basic analysis of functions including identifying intercepts (zeros), extrema, intervals where the function is positive or negative and intervals of increasing and decreasing. Students will investigate average rates of change and begin to differentiate between constant and non-constant rates. Students are beginning to lay the foundation for upper-level mathematics courses by analyzing rates of change.
<u>Unit 4: Linear Functions</u>	5 Weeks	In this unit, students will build on their knowledge of functions to cover an in depth study of linear functions. Students will create, use, translate and make connections among algebraic, tabular, graphical and verbal descriptions of linear functions. Focus will be on interpreting the meaning of intercepts and slope in real-world examples of linear functions. Students interpret and predict the effects of changing the slope and y-intercept in applied situations using linear regression to make and interpret scatter plots and lines of best fit. Students will also find and interpret the correlation coefficient.
<u>Unit 5- Systems of Equations and Inequalities</u>	5 Weeks	In this unit, students solve systems of equations using three different methods (i.e. graphing, substitution, and elimination) and understand the different types of solutions (one, no, and infinite). Students will also solve systems of inequalities by graphing and understand that the shaded region is the solution. Students will also model systems of linear inequalities in real world situations.



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Unit	Estimated Class Time	Overview
<u>Unit 6- Statistics</u>	1 Week	In this unit, students will analyze data displays in different ways and understand how to find measures of central tendencies and measures of spread. Students will create and analyze stem and leaf plots and pie graphs as well.
<u>Unit 7- Polynomial Operations</u>	7 Weeks	In this unit, students will describe and simplify polynomial expressions using exponent laws and polynomial operations. Students will be able to break-down polynomials by factoring. Students will simplify polynomial expressions using a combination of the laws of exponents. Students will model polynomial expressions in real world situations.
<u>Unit 8- Exponential Functions</u>	4 Weeks	Students will graph and analyze exponential functions and will continue exploring general function transformations. Students will also analyze data and represent situations involving exponential growth and decay. Students will practice applying their skills by writing equations and answering questions involving general exponential growth and decay as well as population/bacteria growth, compound interest and half life.
<u>Unit 9- Quadratic Functions</u>	8 Weeks	In this unit, students identify key features of quadratic functions, use them to graph the functions and find their zeros through different methods, and will be able to utilize quadratic equations and functions to model real world application problems. Additionally, students will be able to apply transformations on parent functions to graph absolute values functions and convert between standard form and vertex form of a quadratic equation.

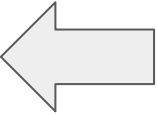
Content Continuum

PreAlgebra/Math 8

This course is the third and final required course in the 6-8 grade-band. In Grade 8, instructional time focuses on three critical areas: (1) formulating and reasoning about expressions and equations, including modeling an association in bivariate data with a linear equation, and solving linear equations and systems of linear equations; (2) grasping the concept of a function and using functions to describe quantitative relationships; (3) analyzing two- and three-dimensional space and figures using distance, angle, similarity, and congruence, and understanding and applying the Pythagorean Theorem.

Current Course

Honors Algebra I



Honors Algebra II

This rigorous, fast-paced course provides a more advanced study of second-year algebra. Concepts and skills are emphasized so that students can make connections and apply the mathematics being learned. Topics include the structure of number systems, equations and inequalities, polynomials and rational expressions, relations, functions and graphing; data analysis (line of regression and correlation), exponents and radicals, quadratics, complex numbers, matrices and determinants, logarithms, and sequences and series. Additional topics may include binomial expansion, permutations and combinations. Graphing calculators are used extensively to enhance concepts and applications. In this Honors course, topics are studied in greater depth with an emphasis on connections and applications. This course meets the Mathematics credit requirement for graduation.

INSTRUCTIONAL / SUPPLEMENTAL MATERIALS

1. Textbook: Glencoe/McGraw Hill Algebra 1-2014
2. Online resources and supplemental to enhance understanding of course content and skills: Delta Math, Desmos Classroom Activities, Kuta Software, and TI-84 Graphing Calculator Activities

All existing resources will be evaluated for alignment to new curriculum

KEY FEATURES OF REVISION

- Restructure all units to include more real-life applications.
- Infuse NJSLA and SAT practice problems throughout all units.
- Added a basic function analysis unit (unit 3) focusing on rate of change.
- Updated all assessments and PBAs.

Special Education sections of CP Algebra I are offered.

Differentiation strategies are included.

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