

Algebra I Overview

The Real Number System	Mathematical Practices
<ul style="list-style-type: none"> Extend the properties of exponents to rational exponents Use properties of rational and irrational numbers. 	1. Make sense of problems and persevere in solving them.
Quantities	2. Reason abstractly and quantitatively.
<ul style="list-style-type: none"> Reason quantitatively and use units to solve problems 	
Seeing Structure in Expressions	3. Construct viable arguments and critique the reasoning of others.
<ul style="list-style-type: none"> Interpret the structure of expressions Write expressions in equivalent forms to solve problems 	
Arithmetic with Polynomials and Rational Expressions	4. Model with mathematics.
<ul style="list-style-type: none"> Perform arithmetic operations on polynomials 	
Creating Equations	5. Use appropriate tools strategically.
<ul style="list-style-type: none"> Create equations that describe numbers or relationships 	
Reasoning with Equations and Inequalities	6. Attend to precision.
<ul style="list-style-type: none"> Understand solving equations as a process of reasoning and explain the reasoning Solve equations and inequalities in one variable Solve systems of equations Represent and solve equations and inequalities graphically 	7. Look for and make use of structure.
Interpreting Functions	8. Look for and express regularity in repeated reasoning.
<ul style="list-style-type: none"> Understand the concept of a function and use function notation Interpret functions that arise in applications in terms of the context Analyze functions using different representations 	
Building Functions	
<ul style="list-style-type: none"> Build a function that models a relationship between two quantities Build new functions from existing functions 	
Linear, Quadratic and Exponential Models	
<ul style="list-style-type: none"> Construct and compare linear, quadratic, and exponential models and solve problems Interpret expressions for functions in terms of the situation they model 	
Interpreting Categorical and Quantitative Data	
<ul style="list-style-type: none"> Summarize, represent, and interpret data on a single count or measurement variable Summarize, represent, and interpret data on two categorical and quantitative variables Interpret linear models 	

Algebra I Introduction

The fundamental purpose of this course is to formalize and extend the mathematics that students learned in the middle grades. Because it is built on the middle grades standards, this is a more ambitious version of Algebra I than has generally been offered. These standards are the baseline expectations of students completing this course. Individual school districts or teachers are welcome to expand on these standards as they see fit to meet the needs of their students. Students will deepen and extend understanding of linear and exponential relationships by contrasting them with each other and by applying linear models to data that exhibit a linear trend, and students engage in methods for analyzing, solving, and using quadratic functions. The Mathematical Practice Standards apply throughout each course and, together with the content standards, prescribe that students experience mathematics as a coherent, useful, and logical subject that makes use of their ability to make sense of problem situations.

In previous courses, students have learned to solve linear equations in one variable and have applied graphical and algebraic methods to analyze and solve systems of linear equations in two variables. Now, students analyze and explain the process of solving an equation. Students develop fluency writing, interpreting, and translating between various forms of linear equations and inequalities, and using them to solve problems. They master the solution of linear equations and apply related solution techniques and the laws of exponents to the creation and solution of simple exponential equations.

In earlier grades, students define, evaluate, and compare functions, and use them to model relationships between quantities. In this unit, students will learn function notation and develop the concepts of domain and range. They explore many examples of functions, including sequences; they interpret functions given graphically, numerically, symbolically, and verbally, translate between representations, and understand the limitations of various representations. Students build on and informally extend their understanding of integer exponents to consider exponential functions. They compare and contrast linear and exponential functions, distinguishing between additive and multiplicative change. Students explore systems of equations and inequalities, and they find and interpret their solutions. They interpret arithmetic sequences as linear functions and geometric sequences as exponential functions.

Statistical understanding builds upon students' prior experiences with data, providing students with more formal means of assessing how a model fits data. Students use regression techniques to describe approximately linear relationships between quantities. They use graphical representations and knowledge of the context to make judgments about the appropriateness of linear models. With linear models, they look at residuals to analyze the goodness of fit.