

A Guide to the Colorado Academic Standards



Mathematics

Algebra I
High School



Working Together

To support families and teachers in realizing the goals of the Colorado Academic Standards, this guide provides an overview of the learning expectations for high school mathematics and offers some possible learning experiences students may engage in during this time.

Why Standards?

Created by Coloradans for Colorado students, the Colorado Academic Standards provide a grade-by-grade road map to help ensure students are ultimately successful in college, careers, and life. The standards aim to improve what students learn and how they learn in ten content areas, emphasizing critical-thinking, creativity, problem solving, collaboration, and communication as important life skills in the 21st century.

Mathematics Education for High Schools (9-12)

The mathematics standards throughout middle and high school build on the strong foundation of number developed during elementary school. Students begin to branch into other areas of mathematics such as probability, statistics and algebra. The study of geometry and geometric proof is also formalized during these years. The work of geometric proof is also extended to all parts of mathematics as students construct viable arguments and critique the reasoning of others. In each grade students investigate the world around them through mathematics. They confront problems and persevere in solving them as they strategically apply mathematical tools and techniques.

Where can I learn more?

- Contact your school district regarding local decisions related to standards, curriculum, resources, and instruction.
- Colorado Academic Standards Booklets: <http://www.cde.state.co.us/standardsandinstruction/GradeLevelBooks.asp>
- Mary Pittman, Mathematics Content Specialist at 303-854-4560, Pittman_m@cde.state.co.us



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At the end of High School, students can...



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Mathematics Learning Expectations for Algebra I

Number Sense, Properties, and Operations

Choose the correct units for a problem such as feet versus miles and consider these units when solving problems.

Patterns, Functions, and Algebraic Structures

Fluently write equations for lines; add, subtract, and multiply polynomials; rearrange quadratic equations by factoring and completing the square; represent the relationship between two quantities using linear, quadratic, and exponential functions; compare and contrast linear, quadratic, and exponential functions; use tables, graphs and equations to solve systems of linear and quadratic functions.

Data Analysis, Statistics, and Probability

Describe if two variables are strongly or weakly correlated; explain the difference between correlation and causation.

Throughout Algebra I, you may find students...

- Distinguishing whether the growth of a population of prairie dogs is linear or exponential.
- Creating quadratic equations that describe the

motion of the earth or the trajectory of a kicked football.

- Explaining why a scientist needs to know if the distance to a nearby asteroid was calculated using miles or kilometers.
- Using graphs, tables, and equations to describe the spread of a virus over time.
- Determining the amount of water wasted by a dripping faucet over the course of one year.
- Examining the relationship between a person's income and their parents' income and making an argument about the relationship between the incomes.
- Using spreadsheets and other technologies to create and represent profit and/or losses of a business.
- Calculating where a snowboarder will land (on a mountain) after completing a jump using a linear equation to model the height of the mountain and a quadratic equation to model the path of the jump.