

Overview of Changes Mathematics Standards

Principles of the Standards Review Process

The Colorado Model Content Standards revision process was informed by these guiding principles:

- Begin with the end in mind; define what prepared graduates need to be successful using 21st century skills in our global economy.
- Align K-12 standards with early childhood expectations and higher education.
- Change is necessary.
- Standards will be deliberately designed for clarity, rigor, and coherence.
- There will be fewer, higher and clearer standards.
- Standards will be actionable.

Notable Changes to the Colorado Model Content Standards in Mathematics

The most evident changes to the Colorado standards are replacing grade-band expectations (K-4, 5-8, and 9-12) with grade-level specific expectations. These are explained here in addition to other changes that are apparent upon comparison between the current mathematics standards and the proposed changes.

1. **Impact of standards articulation by grade level.** The original Colorado Model Content Standards for Mathematics were designed to provide districts with benchmarks of learning at grades 4, 8, and 12. The mathematics standards revision subcommittee was charged with providing more a specific learning trajectory of concepts and skills across grade levels, from early school readiness to postsecondary preparedness. Articulating standards by grade level up to eighth grade in mathematics affords greater specificity (clearer standards) in describing the learning path across levels (higher standards), while focusing on a few key ideas at each grade level (fewer standards).
2. **Articulation of high school standards.** High school standards are not articulated by grade level, but by standard. This is intended to support district decisions about how best to design curriculum and courses – whether through an integrated approach, a traditional course sequence, or alternative approaches such as career and technical education. The high school mathematics standards delineate what all high school students should know and be able to do in order to be well prepared for any postsecondary option. The individual standards are not meant to represent a course or a particular timeframe. All high school students should be able to reach these rigorous standards within four years. Students with advanced capability may accomplish these expectations in a shorter timeframe leaving open options for study of other advanced mathematics.
3. **Integration of P-2 Council’s recommendations.** The mathematics subcommittee integrated the *Building Blocks to the Colorado K-12 Content Standards* document into the P-12 mathematics standards, aligning expectations to a great degree. Important mathematics concepts and skills are defined clearly across these foundational years, detailing expectations to a much greater extent for teachers and parents.
4. **Standards are written for mastery.** The proposed revisions to standards define mastery of concepts and skills. Mastery means that a student has facility with a skill or

concept in multiple contexts. This is not an indication that instruction at a grade-level expectation begins and only occurs at that grade level. Maintenance of previously mastered concepts and skills and scaffolding future learning are the domain of curriculum and instruction – not standards.

5. **Integration of the Common Core State Standards.** These revised standards reflect the inclusion of the Common Core State Standards in Mathematics.
6. **The processes and procedures of school Algebra have been made more explicit.** More specificity about algebraic procedures is apparent in the Patterns, Functions and Algebraic Structures expectations.

For instance, two high school expectations read:

- Expressions, equations, and inequalities can be expressed in multiple, equivalent forms.
- Solutions to equations, inequalities and systems of equations are found using a variety of tools.

7. **Emphasis on concepts and skills across grade levels.** The subcommittee deliberately designed the standards to emphasize specific concepts and skills at different grade levels. This allows teachers to focus on fewer concepts at greater depth than in the past.
8. **Integration of technology, most notably at the high school level.** The standards integrate appropriate technology to allow students access to concepts and skills in mathematics in ways that mirror the 21st century workplace.
9. **Greater focus on Data Analysis, Statistics, and Probability at the middle and high school levels.** Information literacy in mathematics involves the ability to manage and make sense of data in more sophisticated ways than in the past. This involves emphasizing Data Analysis, Statistics, and Probability to a greater degree than in the original mathematics standards.
10. **Intentional integration of personal financial literacy (PFL).** Personal financial literacy was integrated preschool through grade twelve in the math standards in order to assure high school graduates are fiscally responsible. House Bill 08-1168 requires standards which includes these skills: goal setting, financial responsibility, income and career; planning, saving and investing, using credit; risk management and insurance.

Below is a quick guide to other changes in the mathematics standards:

Area		Summary of changes	
	2005 Colorado Model Content Standards	2010 Colorado Academic Standards	
Number of standards	Colorado has six standards in mathematics	Combine current standards 1 and 6 and standards 4 and 5. There are now four standards	
Names of standards	<p>Standard 1 Number Sense and Number Relationships</p> <p>Standard 2 Patterns and Algebra</p> <p>Standard 3 Data and Probability</p> <p>Standard 4 Geometry</p> <p>Standard 5 Measurement</p> <p>Standard 6 Computation</p>	<p>Standard 1 Number Sense, Properties, and Operations</p> <p>Standard 2 Patterns, Functions, and Algebraic Structures</p> <p>Standard 3 Data Analysis, Statistics, and Probability</p> <p>Standard 4 Shape, Dimension, and Geometric Relationships</p>	
Integration of 21st century and postsecondary workforce readiness skills	<ul style="list-style-type: none"> • Not deliberately addressed in original document. 	<ul style="list-style-type: none"> • A design feature of the revision process. • Intentionally integrated into evidence outcomes. 	
P-2	<ul style="list-style-type: none"> • Standards articulated for grade band beginning with kindergarten. • Benchmarks articulated by grade band of K-4 with most geared to upper grades. 	<ul style="list-style-type: none"> • Pre-K included. • Grade level expectations articulated for each elementary grade. • Clear expectations articulated for grades P-2. 	
Number of grade level expectations (GLE)	<ul style="list-style-type: none"> • Average of 27 benchmarks per grade level. 	<ul style="list-style-type: none"> • Average of 7 grade level expectations per grade level (K-8), with 14 for high school. 	
Integration of Personal Financial Literacy (PFL)	<ul style="list-style-type: none"> • Not deliberately addressed in original document. 	<ul style="list-style-type: none"> • A design feature of the revision process. • Intentionally integrated into evidence outcomes. 	