

Gap Analysis of the Common Core Standards and the Colorado Revised Academic Content Standards for Mathematics

The Assessment and Standards Development Services (ASDS) program at WestEd conducted a gap analysis for the Colorado Department of Education (CDE), comparing the Colorado Academic Standards (CO) and the national Common Core State Standards (CCS). This summary provides an overview of the methodology and results for mathematics; detailed notes pertaining to the analysis are included in an annotated version of the CO standards document.

Materials and Methodology

WestEd analysts familiar with mathematics content, standards, assessment, and alignment reviewed each set of standards by grade, as described below. The two sets of standards are organized and referenced in the annotations as follows:

Common Core State Standards for Mathematics

K–8 (individual grade standards), High School (6 conceptual categories)

Domain (letter abbreviation)

Cluster (group of standards)

Standards (numbered and lettered)

Sample References (see CCS p. 5): **3.NBT.1; 5.MD.3a**

Colorado Academic Standards

P–12 (individual grade standards)

Content Area (MA)

Prepared Graduate Competencies

Standard (numbered)

Grade Level Expectation (numbered)

Evidence Outcomes (lettered)

21st Century Skills and Readiness Competencies (numbered)

Sample References: **MA.6.1.2.d** (Mathematics/GR.6/S.1/GLE.2/EO.d); **MA.6.1.2.IQ.1**

(Mathematics/GR.6/S.1/GLE.2/IQ.1)

The analysis and annotations focused on the five possible outcomes described below for overlap between the two sets of standards, using the CO standards as the referent. All annotations are in track changes in the Word version of the CO standards document. All CCS content is accounted for somewhere in the CO standards document.

1. The CCS covers content that CO covers at the same grade level (that is, the *intent* of the content is sufficiently overlapping): No notes are provided in the CO template.
2. CO covers content that the CCS does *not* cover at any grade level: “(CO only)” is inserted at the end of the relevant Evidence Outcome.

3. The CCS covers content that CO covers *only partially* at the same grade level: A note in the CCS Notes column indicates what would need to be added to CO to cover the CCS content fully.
4. The CCS covers content that CO covers at a *different grade level*: Cross-referenced notes in the CCS Notes column at both the target (CCS) and current (CO) grade levels indicate cross-grade overlap of content.
5. The CCS covers content that CO does *not* cover at any grade level: A note in the CCS Notes column indicates the CCS content missing from the CO standards; the CCS standard is inserted in the CO Evidence Outcomes column at the grade level where it appears in the CCS.

Summary of Results

This section summarizes the overall results of the gap analysis for mathematics. Details of the analysis for each standard at each grade level are provided in the annotated CO document.

The CCS target specific topics in certain grades, whereas the CO standards generally show progression of several topics across the grades. Some topics or concepts are introduced earlier in CO than in the CCS. However, some content is covered in depth earlier in the CCS than in CO. Three examples are listed below.

- The CO standards have students begin exploring probability in grade 2, applying concepts of “likely” and “unlikely,” moving into chance and fairness in grade 3, and gradually build concepts across the grades. In the CCS, concepts of probability are emphasized in grade 7 and in high school. Similarly, statistical measures are specified earlier in CO standards than in the CCS, with second graders using concepts of median and range, and third graders using concepts of mode, clusters, and gaps.
- Percent, first mentioned in CCS at grade 6, is being modeled by fourth graders in CO.
- Whereas grade 3 CO standards introduce various transformations, and grade 4 standards address congruence, the CCS do not place a major focus on transformations, congruence, and symmetry until high school, where they are extensively used in geometry proofs.

Although some concepts are not introduced as early in the CCS as in the CO standards, the content in parts of several CCS is not covered by the CO standards until later grades. Following is a list of discrepancies in grade level coverage between the two sets of standards.

- For each grade, K through 8, there were from three to 13 CCS not fully covered until the next grade. Most of these CCS are for grades 3 through 6:
 - There are eight grade 3 CCS not covered until grade 4 in CO.

- There are nine grade 4 CCS not covered until grade 5 in CO.
- There are 13 grade 5 CCS not covered until grade 6 in CO;
- For some CCS coverage occurred two or more years later in the CO standards.
 - For grade 1, two CCS are not covered until grade 3 in CO.
 - For grade 2, one CCS is not covered until grade 4 in CO.
 - For grade 3, two CCS are not covered until grade 5 in CO, and one CCS is not covered until grade 6 in CO.
 - For grade 4, two CCS are not covered until grade 6 in CO.
 - For grade 5, two CCS are not covered until grade 7 in CO, and one CCS is not covered until grade 8 in CO.
 - For grade 6, six CCS are not covered until grade 8 in CO, and one is not covered until high school in CO.
 - For grade 7, three CCS are not covered until high school in CO.

Both the CO standards and the CCS provide guidance as to the nature of the curriculum, with varying levels of specificity as to development of concepts, procedures, and skills. Both sets of standards also show connections across major topics. Two examples follow.

- Within CCS domains, clusters specify connections across major topics. For example, in grade 5 Measurement and Data domain (5.MD, p. 37), a majority of the content is in the cluster “Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.” A major part of this cluster content involves exploring volume while developing and reinforcing other aspects of mathematics, such as representing volume by different three-fold whole-number products to illustrate the associative property of multiplication. Volume reappears as a CCS focus in grade 8.
- The CCS are very specific about certain data displays (e.g., line plots) and how they are to be used and connected to other content (e.g., measurement with fractional lengths as data, and then find the mean length), whereas CO standards describe a greater variety of displays, also in connection with other topics.

Recommended Next Steps

WestEd recommends that the CDE consider whether any nonalignment of content between the CO standards and the CCS are the result of *intentional* decisions (for example, in determining which specific examples of applications of concepts need to be included in the standards document as opposed to in aligned curriculum guidance documents). The grade level at which certain concepts are introduced and intended to be mastered can have implications for both instruction and assessment, so off-grade overlap between the two sets of standards should be evaluated carefully.