

General comments.

1. The format of the standards has changed yet again, but I find the new format clearer. Previously it was difficult to understand the distinction between "students understand" and "students do." After all, how can one assess what students understand unless they can do something to show it? The new format resolves this and now all standards are in a single category that presumably can be assessed. This is a plus.
2. The detail level of the standards vary widely. Some standards reflect a reasonable level of abstraction, but many others are excruciatingly detailed, often to the level of promoting a very specific pedagogy of teaching a particular nuance of mathematics. This seems counterproductive and contributes to the proliferation of the standards, which in turn detracts from their clarity and focus. It also places the standards firmly in the pedagogical territory, instead of focusing on specifying only content.
3. The language of the standards has been significantly cleaned up, and there seem to be just few outright errors left. At the same time in many instances the language is still stilted, formulaic, and inaccessible to an average elementary teacher.
4. The standards for memorization of addition facts to 20 were moved from grade 3 to grade 2, but this still leaves them one grade later than California and Singapore and getting in the way of developing fluency. Similarly, the multiplication table is not expected to be memorized until grade 4, instead of grade 3 as in California and Singapore.
5. Routine use of standard algorithms for addition/subtraction and multiplication/division delayed to grades 2 and 4-5 respectively, and is limited to small-sized numbers only. Students never seem to be expected to gain fluency in arithmetic operations on arbitrarily-sized numbers.

By the End of Grade 5, students that follow the draft will, as compared with California Standards:

- a. Have only limited proficiency with multiplication and division using standard algorithms.
- b. Have only limited exposure to operations with decimals.
- c. Have no exposure to translating problems into simple equations
- d. have no exposure to manipulation of simple expressions
- e. Have no exposure to simple linear functions
- f. Have no exposure to using and plotting data on four quadrant coordinate plane
- g. Have no exposure to negative numbers
- h. Have no exposure to the concept of percent
- i. Have no exposure to integer powers (except powers of 10)
- j. Have no exposure to prime factoring

By the End of Grade 8, students that follow the draft will, as compared with California [Pre-Algebra \(grade 7\) Standards:](#)

- a. Have no exposure to operations with exponents and roots
- b. Have no exposure to manipulation and simplification of expressions
- c. have no exposure to multiplication and division of monomials
- d. have no exposure to graphing of anything except linear functions
- e. Have no exposure to scientific notation
- f. Have no exposure to linear inequalities
- g. Have limited exposure to conversion between fractions, percents, and decimals.

It is perhaps worth noting that item (g) above corresponds to "Rational numbers and operations involving fractions and decimals" that was rated as the second worst in terms of student preparation, by the national survey of Algebra teachers performed for the National Advisory Mathematics Panel in 2007.

Consequently, it seems that the proposed grade 8 content will be insufficient to support an authentic Algebra 1 class in the following grade.

High School content

I did not have sufficient time to analyze the partitioning into courses, but from a superficial look few issues jump out.

1. Chart 1 on page 3 of appendix 3A implies that college readiness level (red dotted line) passes somewhere in the middle of courses 3a/3b and includes the complete content of courses 1 & 2. Yet looking at the actual list of Course 2 content (Pathway A) one observes that 9 of its standards are marked as "STEM". In other words, not all of Course 2 is included in the proposed college-readiness. Consequently, Chart 1 on page 3 misleads when it incorrectly indicates that common core college readiness includes the complete content of courses 1 & 2.

2. The content marked as "STEM" in Course 2 and in Course 3a/3b is currently included in California Geometry and Algebra 2 standards, which are required courses for admission to CSU and UC. In other words, this draft defines college readiness in a way that is unacceptable to our state colleges.

3. The variable detail level of standards, already commented on earlier, is also present in high school content. Consequently, the proposed Course 1 includes 83(!) standards, Course 2 includes 73 standards, and Course 3a & 3b include "only" about 60 standards each. It seems difficult to imagine an assessment that will be able to reliably sample a domain defined by such a large number of standards.

Summary

The new draft has improved its language and format, yet its key deficiencies visible in its prior version

remain. Consequently, it is doubtful this draft can support teaching authentic Algebra 1 course even by the 9th grade. Further, the clarification of the high school standards raises the issue of its college readiness being incompatible with admission requirements to California state colleges.