

## General notes on the Indiana 2014 draft mathematic standards February 2014

This short document will focus on the K-8 standards. Just to mention it briefly, the high school standards are extremely numerous and suffer from much of the same bloat mentioned below. They do include more advanced content than the Common Core does – specifically, more trigonometry, statistics, and calculus – yet those additions still seem insufficient for a complete calculus course, to give an example.

1. The first thing that jumps out is how numerous the standards in this draft are. They sometimes seem slimmer than they are because most of examples and ancillary text were omitted, yet if one counts them it is clear that they represent the return to the mile-wide and inch-deep standards. This is the result of keeping almost all Common Core standards in this draft, and piling on top of them multiple additional standards, taken mostly from the 2009 Indiana draft standards, as well as from other sources. Counting only the content standards and not the process standard, we see:

Standard Set	K	1	2	3	4	5	6	7	8
Common Core	25	24	28	37	37	38	47	43	36
Ind. 2014 draft	<b>33</b>	<b>35</b>	<b>41</b>	<b>59</b>	<b>57</b>	<b>62</b>	<b>45</b>	<b>54</b>	<b>41</b>
Ind. 2009 draft	12	13	15	17	18	17	23	27	29

It is clear that the drafters added a lot and took out very little. Consequently this draft suffers from a large bloat.

2. The second thing that jumps out is the addition of a ninth “Mathematical Process” standard. The Common Core has eight of them and they are left unchanged in the draft, yet another one was added: **Use technology strategically**. This may seem innocuous, yet one needs to ask oneself why this was done. After all, one of the existing eight process standards already says “**Use appropriate tools strategically**,” so the addition may seem unnecessary. Yet for all those who believe that students should have calculators in their hands from Kindergarten and on, the Common Core was disappointing – it essentially banished calculators from K-8 and into high school. For them, the addition of this standard probably signals that calculators are back on in K-8 Indiana schools. Otherwise it is difficult to understand why it was added.

With regard to content, the picture is more mixed. There have been some improvements, but most of the problems with Common Core were left in place, and in some cases made worse.

3. The draft seems to have made some improvement by filling a few major holes in Common Core such as:
  - Conversion among fractions, decimals, and percent was forgotten in CC and now has been restored to grade 6: **“Convert between any two representations (fractions, decimals, percent) of positive rational numbers without the use of a calculator.”**

- CC barely touched on primes and completely forgot about prime factorization. This draft adds important content about primes and prime factorization, although very late in grade 7 rather than in grade 4-5 where it belongs.
4. The draft also moved a handful of content ahead of the Common Core, which is a welcome change as Common Core was unreasonably delaying it. Some examples:
    - That the angles in a triangle sum up to 180 degrees was moved from grade 8 to grade 6.
    - Studying the area of a triangle has been moved to grade 5 from grade 6.
    - Percent is now introduced in grade 5 instead of grade 6 in Common Core.
  5. Yet the list of good news is relatively short. Common Core's method of studying geometry based on transformations (moves, rotations and flips), an experimental method that was unsuccessful and quickly abandoned in the few places it had been tried, is still the preferred method of this draft in grade 8 and high school.
  6. This draft also abandoned one of the better things in Common Core, the deferral of standards on data display and probability to later elementary grades, a path that the Indiana 2009 also took. Instead, this draft suggests adding dozen of data analysis and probability standards in elementary grades that greatly contribute to this draft's bloat.
  7. Common Core already delayed fluency with arithmetic by a year or more as compared to international high achievers, and expected fluency with addition and subtraction of integers in grade 4, with integer multiplication in grade 5, and with integer division and four operations with decimals in grade 6. This draft does not expect fluent addition and subtraction in grade 4 (one of the few Common Core standards it did not adopt), limits grade 5 fluent multiplication only to two-digit whole numbers, and limits the sixth-grade division and operation on decimals to positive numbers only. In other words, this drafts dumbs further down the already low expectation of Common Core for arithmetic fluency. To make things worse, it is also not explicit about the need to learn standard arithmetic algorithms and instead confounds the expectations further by throwing "making estimates" into the arithmetic fluency capstone standards.
  8. Not only is the fluency with arithmetic delayed, but the draft preserves the many wrong-headed Common Core standards that insist ad nauseam in early grades on students to learn arithmetic "**using strategies based on place value, the properties of operations, and/or the relationships,**" which only encourages students to explore multiple approaches that are bound to confuse them, rather than focus on quickly learning one standard arithmetic set of processes to mastery and then being able to focus on learning deeper content.

In summary, this draft did not focus strongly enough on improving the glaring weaknesses of Common Core standards but instead made minor (and sometime negative) changes, and piled a whole lot of new content on top of already massive Common Core. The draft is more bloated than the Common Core, and immeasurably more bloated than the 2009 Indiana draft.

To come up with a good, focused, and coherent set of standards will take much more effort than dump a pile of additional standards on top of the Common Core with little rhyme and reason.