Mike Lawler @mikeandallie

Jul 12 • 7 tweets • mikeandallie/status/1679166860976177161

1/5 (ish) an interesting article, but also what looks like essentially an assurance that the CMF is going to pass whenever the vote happens.

Jelani Nelson @minilek · **Follow**

Another article, this time by the LA Times. I don't think the title is great though — it's not just whiz kids who would be hurt. It's also kids who don't get the right guidance and unknowingly choose a pathway that cuts them off from STEM.

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latimes.com

California's math overhaul aims to help struggling students. But will it h...

Supporters say proposed state K-12 framework will make higher-level math accessible to more. Critics contend it will make poor math outcom...

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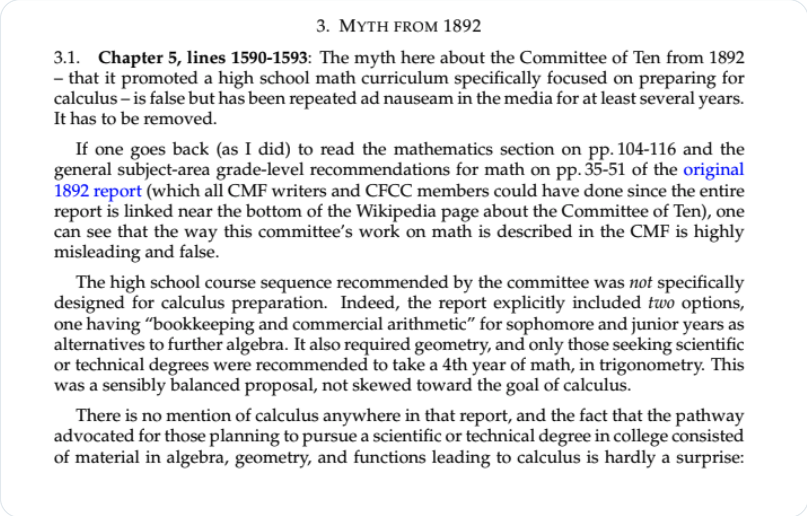
2/5 The article has this quote from the California State Board of Education President Linda Darling-Hammond:

> "Part of what's going on in the framework is an attempt to bring mathematics education into the 21st century," Darling-Hammond said. "The old [way], the idea that calculus is the capstone, is one that originates with a committee of 10 men in 1892."

3/5 Brian Conrad discussed this idea from 1892 in his comments on the 2nd Draft of the CMF. Those comments are here, and I'll share screen shots: https://t.co/xr5yt802pRhttps://drive.google.com/file/d/17O123ENTxvZOjXTnOMNRDtHQAOjtb2Zo/view



3. Myth from 1892

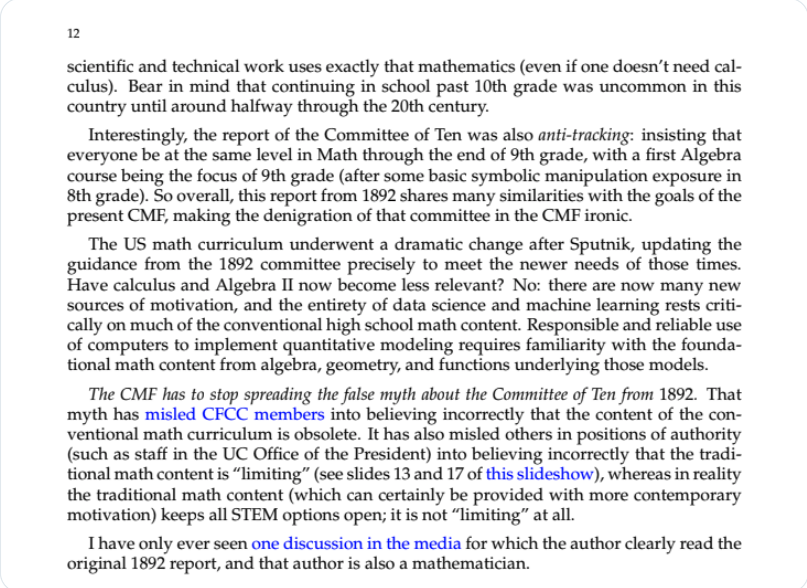
3.1. **Chapter 5, lines 1590-1593**: The myth here about the Committee of Ten from 1892 – that it promoted a high school math curriculum specifically focused on preparing for calculus – is false but has been repeated ad nauseam in the media for at least several years. It has to be removed.

If one goes back (as I did) to read the mathematics section on pp. 104-116 and the general subject-area grade-level recommendations for math on pp. 35-51 of the original 1892 report (which all CMF writers and CFCC members could have done since the entire report is linked near the bottom of the Wikipedia page about the Committee of Ten), one can see that the way this committee's work on math is described in the CMF is highly misleading and false.

The high school course sequence recommended by the committee was *not* specifically designed for calculus preparation. Indeed, the report explicitly included *two* options, one having "bookkeeping and commercial arithmetic" for sophomore and junior years as alternatives to further algebra. It also required geometry, and only those seeking scientific or technical degrees were recommended to take a 4th year of math, in trigonometry. This was a sensibly balanced proposal, not skewed toward the goal of calculus.

There is no mention of calculus anywhere in that report, and the fact that the pathway advocated for those planning to pursue a scientific or technical degree in college consisted of material in algebra, geometry, and functions leading to calculus is hardly a surprise:

4/5 The comments continue (and finish) here



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scientific and technical work uses exactly that mathematics (even if one doesn't need calculus). Bear in mind that continuing in school past 10th grade was uncommon in this country until around halfway through the 20th century.

Interestingly, the report of the Committee of Ten was also *anti-tracking*: insisting that everyone be at the same level in Math through the end of 9th grade, with a first Algebra course being the focus of 9th grade (after some basic symbolic manipulation exposure in 8th grade). So overall, this report from 1892 shares many similarities with the goals of the present CMF, making the denigration of that committee in the CMF ironic.

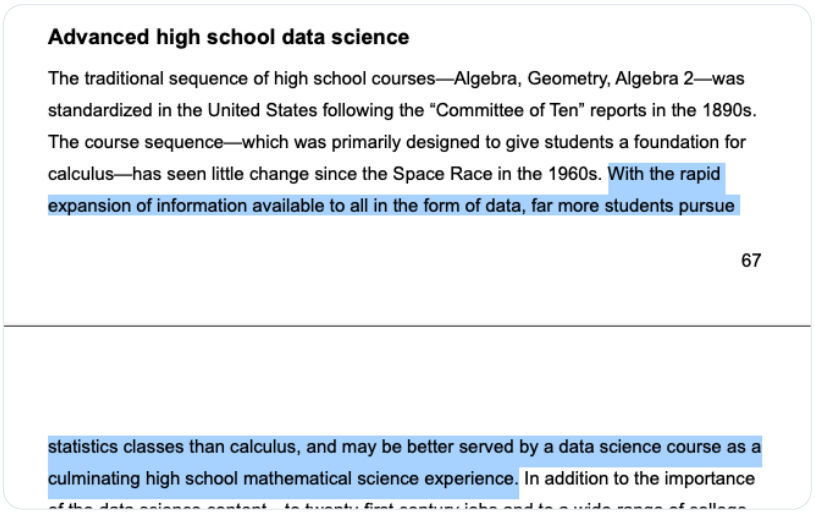
The US math curriculum underwent a dramatic change after Sputnik, updating the guidance from the 1892 committee precisely to meet the newer needs of those times. Have calculus and Algebra II now become less relevant? No: there are now many new sources of motivation, and the entirety of data science and machine learning rests critically on much of the conventional high school math content. Responsible and reliable use of computers to implement quantitative modeling requires familiarity with the foundational math content from algebra, geometry, and functions underlying those models.

The CMF has to stop spreading the false myth about the Committee of Ten from 1892. That myth has misled CFCC members into believing incorrectly that the content of the conventional math curriculum is obsolete. It has also misled others in positions of authority (such as staff in the UC Office of the President) into believing incorrectly that the traditional math content is "limiting" (see slides 13 and 17 of this slideshow), whereas in reality the traditional math content (which can certainly be provided with more contemporary motivation) keeps all STEM options open; it is not "limiting" at all.

I have only ever seen one discussion in the media for which the author clearly read the original 1892 report, and that author is also a mathematician.

5/5 This particular discussion wasn't something I was really focused on, so I don't know if there is any discussion of the work from 1892 in version 3 of the CMF or not. Some of Conrad's comments were taken and some weren't.

6/5 Found the reference in CMF Version 2 and it was not in version 3, so the reference from 1892 in the LA Times article is something that was actually deleted in the CMF version 3. Here's the language from chapter 4 in version 2



Advanced high school data science

The traditional sequence of high school courses—Algebra, Geometry, Algebra 2—was standardized in the United States following the "Committee of Ten" reports in the 1890s. The course sequence—which was primarily designed to give students a foundation for calculus—has seen little change since the Space Race in the 1960s. With the rapid expansion of information available to all in the form of data, far more students pursue

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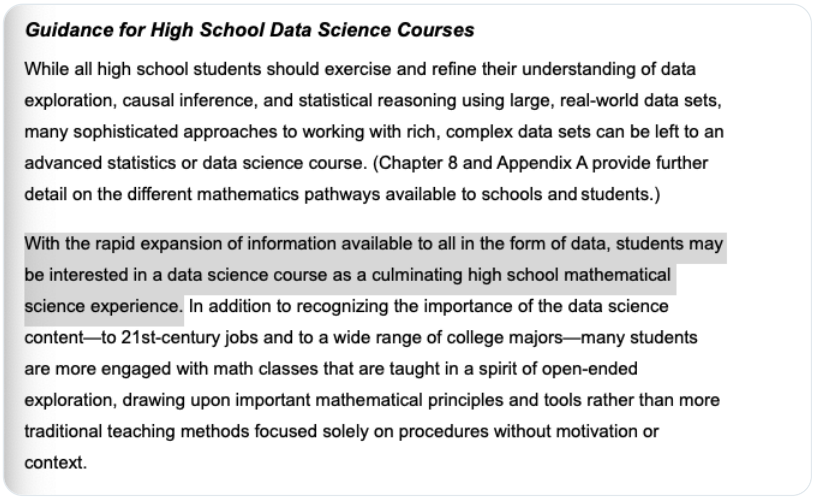
statistics classes than calculus, and may be better served by a data science course as a culminating high school mathematical science experience. In addition to the importance

7/5 And here's what version 3 says - the 1890's referene is gone



Guidance for High School Data Science Courses

While all high school students should exercise and refine their understanding of data exploration, causal inference, and statistical reasoning using large, real-world data sets, many sophisticated approaches to working with rich, complex data sets can be left to an advanced statistics or data science course. (Chapter 8 and Appendix A provide further detail on the different mathematics pathways available to schools and students.)

With the rapid expansion of information available to all in the form of data, students may be interested in a data science course as a culminating high school mathematical science experience. In addition to recognizing the importance of the data science content—to 21st-century jobs and to a wide range of college majors—many students are more engaged with math classes that are taught in a spirit of open-ended exploration, drawing upon important mathematical principles and tools rather than more traditional teaching methods focused solely on procedures without motivation or context.

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