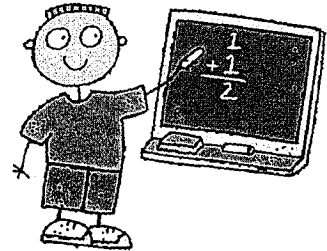


The desire of the authors of this packet is to:

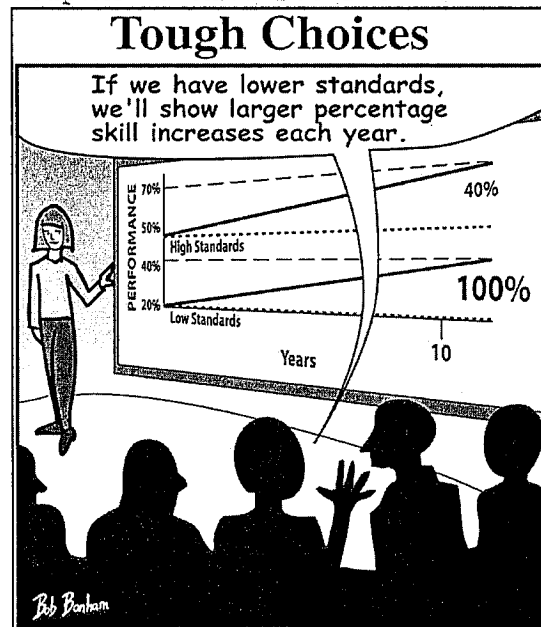
1. Update legislators and the public on the current state of mathematics in Utah

and

2. Urge support of the goal for Utah to have world class math standards



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Grading our Students

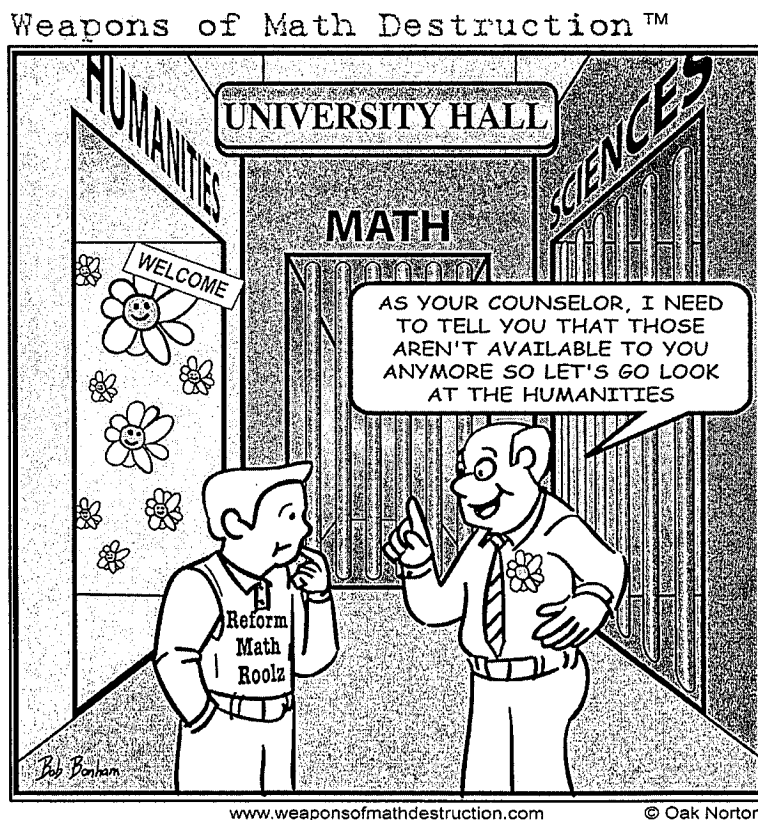
U.S. Chamber of Commerce rates Utah math performance standards.....C
(<http://www.uschamber.com/icw/reportcard/default>)

+

Fordham Foundation grades Utah math performance standards.....D
(<http://www.edexcellence.net/foundation/publication/publication.cfm?id=338&pu>)

=

The number of students taking remedial math at Utah Valley State College and Salt Lake Community College to prepare for college level work.....>60%



Core Curriculum Steering Committee Appointed by: Brett Moulding and Nicole Paulson (USOE)

Minutes of the July 19, 2007 meeting of this committee:

“Brett Moulding asserted that the charge to the committee comes from the State Board of Education: to review and revise the Math Core Curriculum using existing structure”

The committee chosen comprised a majority of those who signed a document a year ago which indicated that Utah did not need to change their standards stating:

"The Utah State Mathematics Core is mathematically appropriate and has a good balance between basic skills and conceptual understanding. Although there are areas where the Utah State Mathematics Core could be improved, making those improvements are a much better choice than abandoning them and adopting the standards from another state."

In doing so, they accept our prior standards as acceptable even though the Fordham Foundation rated them a "D" and the US Chamber of Commerce rated them a "C".

ADMITTING DEFEAT

“It was generally agreed upon that if there are to be extensive changes to existing core curriculum, the time period designated to this committee for completion of this project is not a sufficient timeline...too short to do an adequate job...”

It wasn't until the completion of the process that State Board member asked, "What are world-class standards?"

“The instructions from the Board were to only revise - **not rewrite** - existing poorly ranked standards”

The state secondary math specialist Diana Suddreth reported, "The SMECC group gave unanimous support to Nicole's [Paulson] direction of rewriting the core by amending the current core."

Email sent from Oak Norton, a concerned parent, to members of the State School Board on August 7, 2007:

Dear Superintendent Harrington and State School Board Members,

With recent events over the math issue, I have a couple of questions I think would shed some light on the job done by the Steering Committee on math standards. Last fall when the issue arose and the state office voluntarily opted to rewrite standards rather than have the legislature handle the job, the resolution adopted stated:

Resolved, that the Utah Legislature's Public Education Interim Committee (Committee) endorse the plan for a full review of math standards by the Utah State Board of Education (USBE) to result in world-class math standards. *

Two questions arise from this resolution:

- 1) What evidence can you provide that the Steering Committee took this charge seriously to provide "world-class" standards?
- 2) What evidence can you provide that the new core does provide world-class standards?

Sincerely,

Oak Norton
www.oaknorton.com

*Taken from the Education Committee Resolution, full text in appendix.

Math Standards should be written by Mathematicians.

What is the difference between a Mathematician and a Math Educator??

When writing new math standards we should establish a foundation set by credentialed *mathematicians*. After new world class standards have been written and ratified, let the *math educators* do the job for which their credentials prepared them.

The Difference Between a Math Educator and a Mathematician

There is often confusion understanding the difference between Math Educators and Mathematicians. This confusion is easily explained by simply looking at the credentials and job description of each discipline.

MATH EDUCATOR CREDENTIALS

Math Educators usually have advanced degrees in math education (or just education), and they do research (or otherwise work in) education, pedagogy, teaching methods, etc. Math education students do not take a single 400 level math class (they are capped at 300-level math classes).

MATHEMATICIAN CREDENTIALS

Mathematicians are experts in mathematics subject matter. They have advanced degrees in mathematics; some do research on the frontier of cutting edge mathematics. Others apply mathematics on the cutting edge of fields like physics, chemistry, computer science, engineering statistics, business economics, etc.

MATH STANDARDS: Would you want a Physical Therapist operating on your knee?

Math standards must be precise as one minimal mistake in the world of mathematics (such as a faulty bridge calculation) can result in human death. As a result, those with advanced mathematics credentials must write standards. Asking math educators to write math standards would be similar to asking a physical therapist to perform knee surgery. Math educators come to the process after the standards are written and physical therapists speed up recovery after the surgery takes place.

FOCUS ON STANDARD WRITING

Math Educators muddy the waters by focusing on funding, teacher training, policies, past failures, and teaching methodology while standards are being written. Mathematicians avoid these issues and focus on the precise math necessary for high standards. They know what principles need to be mastered before moving on the next level of math. They know what level of math proficiency needs to be met upon graduation from high school so the student is prepared for either higher education math or higher paying jobs that require mastery of math.

After the math standards are written, the mathematicians turn the standards over to the educators so they know what to teach and at what grade level it needs to be taught and what competencies to test for.

The math committee adjusted current standards-some improvements were made, but no "full review of to result in world-class standards"

Legislative Education Chairs asked Dr. Milgram to review the rewrite of standard revisions.

Who is Dr. Milgram?

R. James Milgram

- Professor of Mathematics,
- Stanford University
- Member: National Board for Education Science, the Presidential Board that oversees the research arm of the U.S. Department of Education,
- Member: NASA Advisory Council (the first and so far only mathematician to be accorded this singular honor),
- Member: Both the National and International Advisory Boards on TEDS-M, the international study of teacher preparation that will take place in 2009.
- Member: Advisory board National Council on Teacher Quality.
- Member: Achieve Mathematics Advisory Panel as well as other Advisory Boards
- Main reviewer and/or outside mathematics advisor for current Massachusetts Mathematics Standards, New York High School Mathematics Standards, Georgia Mathematics Standards, NCTM Focal Points.

Dr. Milgram enlisted the help of Dr. Wu-Mathematician at UC Berkeley.

And what did Dr. Milgram say?

$$\begin{aligned}8x - 3 &= 3x + 17 \\8x - 3x - 3 &= 3x - 3x + 17 \\5x - 3 &= 17 \\5x - 3 + 3 &= 17 + 3 \\5x &= 20 \\ \frac{5x}{5} &= \frac{20}{5} \\x &= 4\end{aligned}$$

Excerpts from a Response to the Letter from K. Burningham and P. Harrington*

“In my first letter, what I was chiefly objecting to was the fact that these so called world class mathematics standards that Utah just adopted are filled with MAJOR MATHEMATICAL ERRORS. I went to considerable lengths to list JUST SOME OF THEM IN THE SIXTH AND SEVENTH GRADE STANDARDS. There are many more in these grades and even more in grades 2 - 5. So one could paraphrase my main objection as pointing out the fact that these standards are functionally MATHEMATICALLY ILLITERATE! As things stand, I would fully expect these new Utah Math Standards to receive an F in the next cycle of ratings by the Fordham Foundation since major mathematical errors are disqualifying...”

“As to the spurious argument in the Burningham-Harrington letter that Singapore does not have any Nobel Prize winners, I would first suggest that (1) Singapore is both a very small country and (2) a very new country. In fact, it was a British colony from 1867 - 1942, and only fully self-governing since 1955. Realistically, their current education system and its results can't be said to be much more than 40 years old, if that, and people tend to win the Nobel Prize only late in their lives. The modern infrastructure in Singapore is even more recent. It is hard to believe that Burningham and Harrington were not aware of these facts...”

“Additionally, it is worth noting that the last time our top students were compared with the top students from other countries was in 1995. At that time our top students scored even worse relative to the top students in the high achieving countries than did our average students relative to their average students...”

“There will again be an international test of advanced students in 2009. However, when our country was invited to participate, both the U.S. Department of Education and the National Science Foundation, for the first time, refused to allocate funding. The most likely explanation for this extraordinary event is that, at the highest levels in our government, our leaders are afraid of what the comparison will show...”

R. James Milgram
Professor of Mathematics,
Stanford University

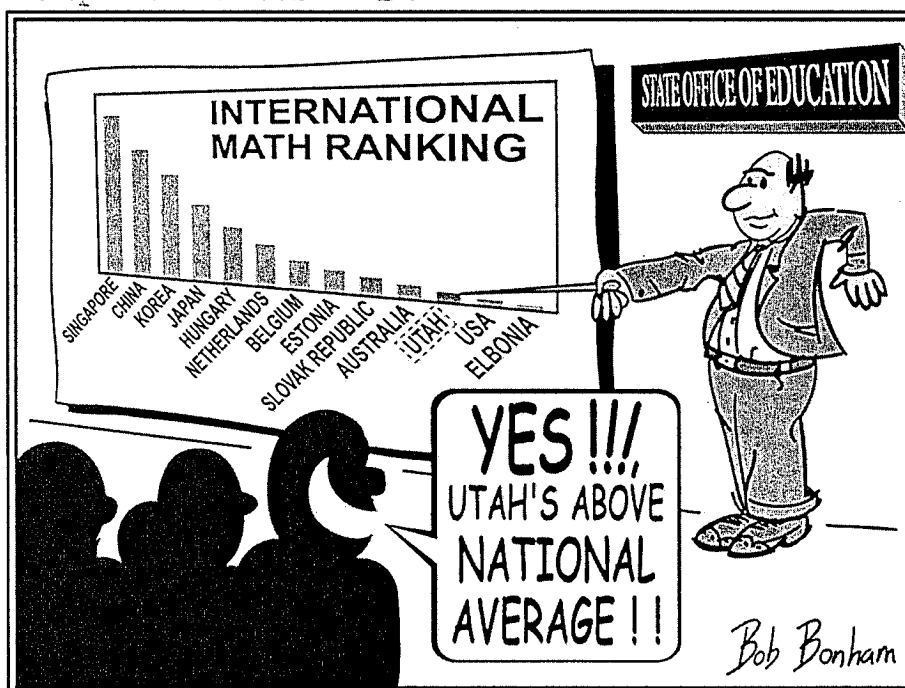
*See Full Text in Appendix

Singapore and Japan rate higher on TIMSS (Trends in International Mathematics and Science Study) than the United States.

(<http://nces.ed.gov/timss/>)

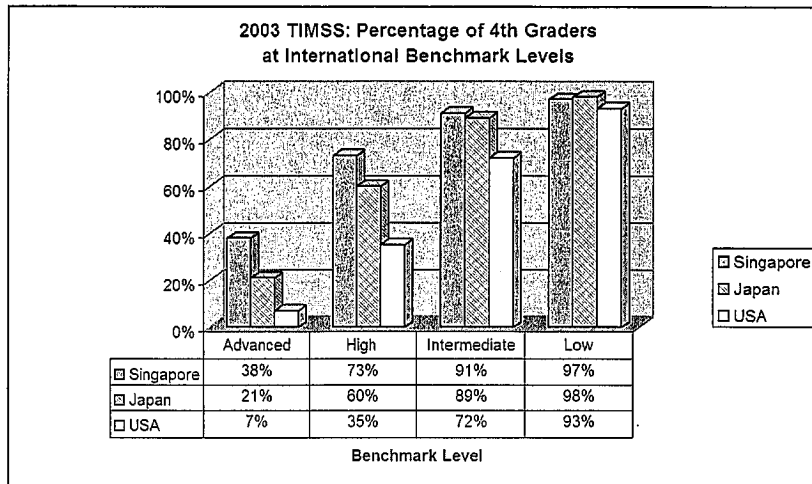
The US is withdrawing from TIMSS - Perhaps
because we are taking such a beating.

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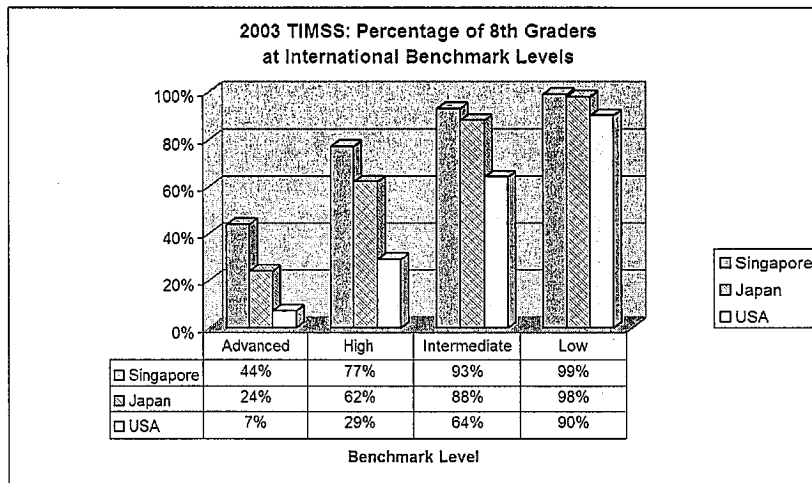


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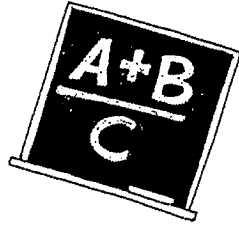


In other words, almost 40% of Singapore's population of 4th graders are at an advanced level of math while only 7% of the USA population is (over 5 times as many). 73% of Singapore's 4th grade population is at a high level of math understanding while the USA is at 35% (over twice as many).



In 8th grade, the situation is worse. The USA is dropping while Singapore is gaining in ability. Singapore has over 6 times as many students in the advanced category (44% to 7%) and nearly 3 times as many in the high level of math understanding (77% to 29%).

Remember, Utah is in the bottom third of the USA for math skills when viewed demographically.



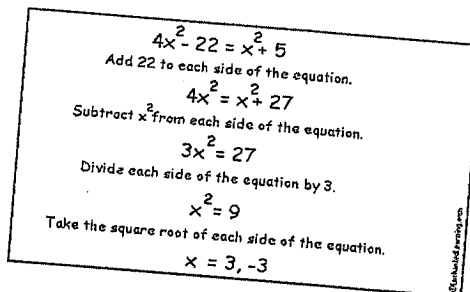
A) The Legislative Committee Chairs sent a letter to the State Board asking them not to approve the recommendations of the Math Committee because of Dr. Milgram's review.

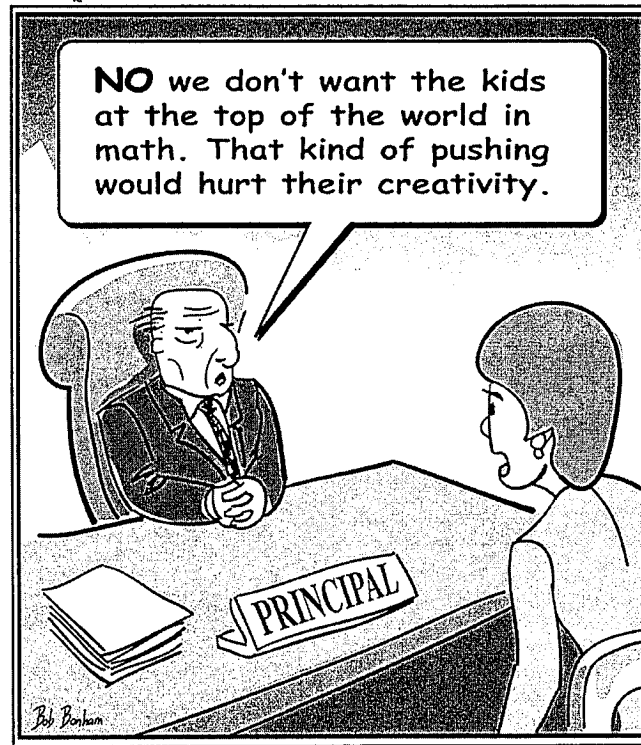
Which lead to.....

- B) Math Committee members responding in the State Board meeting by
1. Accusing legislators of last minute attacks
 2. Accusing Dr. Milgram of trying to enhance his credibility as well as other personal attacks
 3. Asking the State Board to accept the report of the Math Committee

Which lead to.....

- C) The State School Board choosing to
1. Criticize the Legislators' letter (Teresa Tier-State School Board-presented the letter from the legislators to the State Board, saying their letter was "in poor taste")
 2. Ignore Dr. Milgram's review
 3. Vote to accept the Math Committee's report, and then focusing a large portion of agenda time discussing milk vs. Pepsi in vending machines.





Amount of State Board agenda time given to Dr. Milgram's review.....Less than 5 minutes

Amount of agenda time given to vending machine issues.....over 30 minutes!

Is that reflective of the State School Board's Priorities?

Summary of the Problem

as written by Dennis Lisonbee (Math Professor, UVSC):

1. There is a consensus within the business community, educational community, legislators and parents in Utah that upon graduation our children should be able to compete on a global level in math.
2. The legislature passed legislation to facilitate raising math standards in primary and secondary education to world-class standards.
3. Since other countries, such as Japan, and states, such as California, have rigorous math standards that give students the opportunity to compete globally, legislators, parents and educators looked to those standards that could serve as a model for Utah.
4. The process was set to fail from the beginning when Brett Moulding set an antagonistic tone for the process by telling the committee *that the legislature does not have the authority to set standards but that the committee will re-write the standards as a courtesy to the legislature.*
5. Instead of using globally competitive math models to write new standards from the ground up, the committee choose to re-write the old standards.
6. Because of the rush, there was little time for review by business, education, the legislature and parents.
7. Since legislators, parents and business leaders felt the new standards were not going to meet world class standards, Dr. Milgram, a Stanford scholar was asked to evaluate the new standards.
8. The Utah State School Board did not review the Milgram document. Members of the Board who are antagonistic towards Dr. Milgram dismissed his analysis by accusing him of writing the document for personal gain.

FINAL EXAM:

Given the information presented, the Legislative Education Committee should:

- a) Request Drs. Milgram and Wu provide a template for world-class education and assure all Utah math standards follow the template
- b) Create a Math Task Force to accomplish the goal of the original resolution to “review math standards to result in world-class standards
- c) Legislate all math teaching instruction
- d) All of the Above
- e) None of the Above- PLUS increase funding for remedial math at the college level.

x	y
-3	8
-2	7
-1	6
0	5
1	4
2	3
3	2
4	1
5	0
6	-1
7	-2
8	-3

