

Is There Cure for Our *Age-Old* Math Phobia?

1998: Article: [An Inordinate Fear of Algebra](#)

"A FEW weeks ago, high-school algebra made the front page of the Wall Street Journal. New International comparisons show that American schools teach algebra badly. **So what else is new" If some study revealed that American schools were doing well, the whole country would have a heart attack and drop dead....** "Does any word.' the Journal asks, 'strike greater fear in the hearts of American ninth-graders - and their parents - than algebra?'...."

1923

The Reorganization of Mathematics in Secondary Education,

A Report by the National Committee on Mathematical Requirements
under the auspices of the Mathematical Association of America, Inc., 1923.

8. There is dissatisfaction with the results achieved in the arithmetic of grades seven and eight. It is felt that the time and money spent should result in (1) a higher degree of accuracy and speed in applying fundamental principles to fractions (common and decimal), (2) greater skill in dealing with percentage relations, and (3) more significant information about common business forms.

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8. *The Norms of Performance in Arithmetic Are Exceedingly Low.*—Teachers of mathematics have in recent years had an opportunity to study the findings resulting from numerous school surveys. One outstanding conclusion to be drawn is that the results obtained in the arithmetic of grades seven and eight are very unsatisfactory. We assume that in the first six grades the child shall attain a reasonable degree of accuracy and speed in the fundamental operations with integers and fractions. The result of tests shows that this assumption is not even realized in the seventh and eighth grades. We have sufficient evidence to make us sympathetic with the complaints of the industrial and commercial world resulting from its contact with pupils who have achieved only 50% to 80% accuracy....

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The foregoing conditions seem (without evidence based on standard tests) to exist with reference to percentage relations. This topic is generally considered important and it receives emphasis in text books. But the degree of mastery of percentage relations seems low even among college students. The experience of the teachers in these schools suggests that a satisfactory skill in computation cannot be assumed as initial equipment even among ninth grade pupils, and that adequate drill must be provided from time to time. In short, computation must be "kept going."

1929

The National Council of Teachers of Mathematics,
Significant Changes and Trends in The Teaching of Mathematics Throughout the World
Since 1910, Teacher College, Columbia University, 1929.

Hate Math, Fail Math

At the present time too many people dislike the study of mathematics. I believe that this is unnatural. Perhaps the trouble goes as far back as the arithmetic of the elementary school. Certainly the teacher at this point in the pupil's mathematical development has a great responsibility because of the importance of first impressions. There is some doubt whether all pupils should be encouraged and stimulated to continue the study of mathematics beyond the junior high school. But whether they continue or not, they should not be taught to hate the subject.

.....

We have too many failures in ninth-grade algebra and the pupils spend too much time failing. We cannot justify failures of from twenty to forty per cent in a normal group in any school. . . .

.....

<p><u>One of the most vital questions</u> to be settled is that of the necessary qualifications for a successful teacher of mathematics. <u>In this respect our standards are far behind those of European.</u></p>

The publications of the United States Bureau of Education from 1911 to 1918 which dealt with the work of the International Commission were widely circulated. These reports showed that in regard to content, at least, we are far behind the practice in European Schools.

1947

[School Science and Mathematics, 1947](#)

Algebra Phobia

Perhaps we should change the word "algebra" to something else, something which will not put such fear into the minds of children when they hear the word mentioned. For some reason or other pupils about to enter a course of study in algebra are imbued with this fear and such children are almost licked before they start. They have learned from older brothers or sisters or friends that algebra is very difficult to master and they take it for granted that they too will find it hard. These older brothers or sisters have heard this from those before them and therefore they were impressed with the same idea. And so it has carried down through the years until now we are faced with the problem of just how to dispel this fear.

1947

Plight of College Chemistry Students

In the introductory college course in chemistry one of the main difficulties and causes of failure is the mathematics involved. Too often a student because of a fear or distaste for all things mathematical will avoid chemistry entirely, or if he does take the course, will be handicapped unless he receives suitable instruction and guidance. . . .

The chemistry instructor must, therefore, teach or reteach all the mathematics used in his course, beyond the four most fundamental processes of arithmetic.

1954

Plight of Graduate Students -- Future Teachers

STUDENTS WORKING for graduate degrees in education are frequently required to take a course in statistics. They usually have to do some elementary statistical work in courses in educational psychology and courses in measurements. It is common knowledge that graduate students fear courses in statistics or the segment of any course that calls for the learning or use of statistics. In many instances this emotional reaction is strong enough to interfere with the learning of even elementary concepts and skills. The authors are under the impression that some, perhaps much, of this unreasoned fear stems from lack of competence in arithmetic computation on the part of students.

The students whose arithmetic inadequacies are presented in the preceding paragraphs are not a unique group. It would not be difficult to obtain similar data for other graduate students. They raise the question of why this degree of incompetence exists and how bad it must be for others who are less able and less well educated. It is not the purpose of this presentation to look into causes or offer solutions, but rather to present further evidence of the need for finding out what is wrong either with the arithmetic that is taught or the way it is taught. If those from whom our pupils are to learn their arithmetic are so lacking in arithmetic competence and understanding, what can we expect of our pupils?

1967

Sol Weiss, *Innovations and Research in the Teaching of Mathematics to the Terminal Student*, Experimental Programs, [The Mathematics Teacher](#), October 1967.
[Weiss, West Chester State College, West Chester, Penn.]
[Experimental Programs, edited by Eugene D. Nichols, Florida State University, Tallahassee, FL]

Has America Shot Herself in the Foot?

We know what we did with them in the past. We stuck them into a general math class, assigned to them the less-favored and sometimes the least competent teachers, and hoped for the best.

A typical mathematics program for these students consisted of a review of the arithmetic they were supposed to have learned in previous grades, . . .

Very often these classes became so bogged down with the "review" that they never got much past it. . .

The results of this kind of mathematics education are well known. It produced many students who never really acquired the basic skills and understandings for dealing with number and form. . .

They lost confidence, faith, and hope in their ability to succeed in mathematics. They developed such an intense dislike and fear of mathematics that it became an obsession with them for the rest of their lives.

1998

Interview with *Fail Burrill*, **President** of the NCTM**
Notices of the AMS,*** January **1998**.

Has America Shot Herself in the Foot?

Notices: *I'd like to ask you about teacher background and qualifications. Many people worry that teachers don't have enough background to teach in the traditional way or in the reform way. Do you think that these worries are justified?*

Burrill: I think these worries are very much justified. It's a matter of very much concern to me that we're placing demands on teachers for which we have not prepared them. We have many teachers who are not certified in mathematics. About 37 percent of mathematics teachers in our high schools do not have minors in mathematics or mathematics education, and about 89 percent of teachers in grades 5-8 do not. And that means that these teachers have a minimal background in mathematics.

In many schools in many states, to teach K-8 mathematics all you need to have is one or two survey mathematics courses. We're asking these teachers to teach things like discrete math and statistics and algebra and geometry, to go beyond the arithmetic level, but we haven't given them the background and content knowledge that they need in order to make sense of what they're supposed to teach. And that's real scary.

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There never was a golden era of mathematics education. We did produce—and I was part of it actually—some wonderful students right after Sputnik. But we concentrated all of our energies on a very, very few students. We disenfranchised three-fourths of the student population and raised a nation of people who are literally afraid of mathematics. They don't want to help their children with mathematics because it's too hard; they never "got it". We can't afford to do things that way anymore.

** NCTM: National Council of Teachers of Mathematics

*** AMS: American Mathematics Society. Notices of the AMS, their official publication.

1990s

Articles by Black leaders*

Algebra, The New Civil Right Math = Jihad

Abdulalim Abdullah Shabazz

“Muslims in America are undercounted, and there’s power in numbers.”

* Apology. I have not found the articles yet.

2016

MSN, 3-27-2016 Associated Press

Is algebra an unnecessary stumbling block in US schools?

By KAREN MATTHEWS, Associated Press 4 hrs ago

NEW YORK — Who needs algebra?

That question muttered by many a frustrated student over the years has become a vigorous debate among American educators, sparked by a provocative new book that argues required algebra has become an unnecessary stumbling block that forces millions to drop out of high school or college.

"One out of 5 young Americans does not graduate from high school. This is one of the worst records in the developed world. Why? The chief academic reason is they failed ninth-grade algebra," said political scientist Andrew Hacker, author of "The Math Myth and Other STEM Delusions."

Yahoo, 5-15-2016 The Washington Post [Education](#)

Is the nation’s math instruction in crisis?

By [Jay Mathews](#) Columnist May 8 at 4:34 PM

Many are puzzled about why the **Common Core State Standards**, the nation’s latest educational fashion, seem to advise against the popular policy of letting kids take algebra a year earlier than usual. It is all pretty confusing.

John Fourkas, both a parent and a University of Maryland chemistry professor, said much of the Common Core-based math curriculum seems to him “completely disjointed, focusing too much on specialized vocabulary.” He said there is “not enough repetition of key skills as new topics are introduced.”

“Our son has had the misfortune of being on the leading edge of the reform, and so every year there is a new curriculum with which the teachers are not familiar,” Fourkas said. “Our son is in Algebra 2 this year, and I give them great credit for learning from their mistakes and designing a curriculum that is far more coherent.”

Yahoo, 6-14-2016

Debunking the Myths Behind ‘The Math Myth’

The Atlantic June 13, 2016

When the political scientist **Andrew Hacker** published *The Math Myth and Other STEM Delusions* earlier this year, he didn't break the internet. But he arithmetic is useless to most people, that requiring algebra in high school is an obstacle that certainly stirred up the math establishment in arguing that anything more complicated than drives the country's dropout rates, and that the Common Core's approach to math, which calls for more complex math like trigonometry, is a mistake.....

Yahoo, 6-26-2016 Business Insider Educaiton

Why San Francisco stopped teaching algebra in middle school

Ben Christopher, [Priceonomics](#)

San Francisco in the twenty-first century is the town that STEM built. A city increasingly synonymous with startup culture and tech-centric innovation, its rapidly growing economy speaks to the value of studying science and mathematics. Which is why it came as a surprise when the San Francisco Unified School District (SFUSD)-....announced in 2014 that it would no longer offer Algebra I to eighth graders.....

Yahoo, 5-6-2016

High failure rates spur universities to overhaul math class

It's not Common Core, but reforms were born from the same ideas by [Karen Shakerdge](#)

SAN DIEGO, Calif. — When Chelsea Castilloadame left the Navy Medical Corps after five years to pursue her longtime plan of becoming a doctor, she knew her transition back to civilian life was going to be tough. But she wasn't prepared to feel so unprepared for — of all things — math class.

“I would leave classes and exams literally in tears,” Castilloadame, 24, said. “I went to the bathroom and I cried after almost every math exam. It was very humbling to go into the professor and say, ‘I am so frustrated. I'm balling my eyes out and I know this material.’”....

Castilloadame is one of many students who experience mathematics as a roadblock to other fields — such as science, technology and engineering. In fact, about 50 percent of students don't pass college algebra with a grade of C or above, as noted in a recent report, “Common Vision,” from the Mathematical Association of America (MAA). The report called Americans' struggle with math “the most significant barrier” to finishing a degree in both STEM and non-STEM fields. In the worst-case scenarios, students can get stuck in remedial classes and fall so far behind that they drop out of college all together.

“There's going to be a need for a million more STEM graduates in the next decade than we're currently producing,” said Chris Rasmussen, professor of mathematics education at San Diego State.”.....

Yahoo, 6-22-2016

Video: College drops math for 'diversity' course

[FOX News Videos](#) June 21, 2016

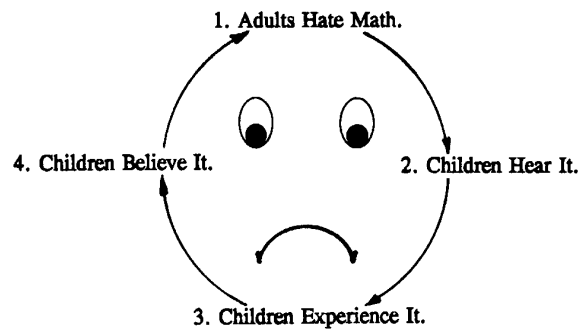
Students at Wayne State University in Michigan no longer have to take math course to graduate, may be required to take a diversity course, instead

1996

Cycle of Failure In Math!

Ruth C. Sun

The following diagram, with brief comments, explains how the cycle of failure in math has been perpetuated.



1. Adults Hate Math.

The adults who did poorly or failed in math at school often speak freely within the hearing of their children about how difficult math was or how much they hated it.

2. Children Hear It.

Very early children learn from adults that math is difficult. The “seed of failure” in math has been unintentionally planted in the minds of these children.

3. Children Experience It.

When these children begin to have problems with math (as early as 2nd grade), teachers generally are not able to nip the problem in the bud because they don't know the unique nature of mathematics*, nor do they properly apply principles of child psychology to education.

4. Children Believe It.

These children drag themselves to math class 5 days a week for 10 long years, if they do not drop out, not knowing what's going on in math class. They no longer care whether or not they learn it. Their experience verifies what they heard, that “math is hard,” and they come to believe that they are “not good in math.” Thus, they complete the circle and come to hate math like the adults before them.

* Ironically, *many* teachers find themselves teaching math which they neither like nor understand. These teachers themselves are products of the math failure cycle. Unfortunately, the college training did not help them gain a better understanding of mathematics. They would be in the same boat with their students, were it not for the Teachers' Edition which gives detail classroom instructions and gives answer to every math problem. *The problem is that these teachers usually teach the lower grades and thus help to propagate/perpetuate the failure cycle!*

In the very short lived journal, School Mathematics, there appeared a definition: "Mathematics is that science in which you do not know what it is you are talking about and you do not care whether what you say about it is true."

School Science and Mathematics, A Journal for Science and Mathematics Teachers in Secondary Schools, Vol. V, 1905, 239.