

Chapter 10 Why Public High School Math is Failing our Students

Questions to Start

What happens if a student gets discouraged with math early in his or her middle or high school career?

What happens if a student decides s/he can't understand math and pass the required tests to graduate from high school?

Give up on High School and Drop out?

If so, what does this cost the Student in terms of his or her future job opportunities and life?

What does it cost the school and community in terms of funding?

What does it cost our economy?

What effect does it have on our society?

My answer is that this is a horrible situation, especially considering it is so unnecessary.

What happens to a student who is interested in some STEM subject and can't learn the necessary modern math Tools and Concepts to compete with better trained students?

You tell me. I think the consequences are horrible for the student, our economy, our society, and our future.

And, this too is unnecessary today.

Let's think about the effect our current SMC is having on our Public Schools.

There are basically three categories of students.

1. Students who are not going to college, but need to learn the Workforce Math necessary to pursue a wide variety of career paths in the technical world we live in today.

This Math can be taught to them in about one or two years if Proper Content and SPIKE Pedagogy is utilized.

Many of these students are the one's who drop out of school if they become too discouraged with the math taught in the Standard Math Curriculum.

This is a huge loss and cost to our economy and society, and of course, a real disaster for the student.

And, it so unnecessary today thanks to modern technologies.

2. Students who plan to go to college, but are not interested in STEM subjects. These students need the same Workforce Math along with some Consumer Math.

They also need some extra Math to excel on exams like the SAT or ACT or CLT. But, they don't need very much additional math. See Tier 3. That they also need is coaching on how to take a timed tricky exam efficiently.

Again the Standard Math Curriculum is not an easy way for them to get just what they need for reasons explained in Chapter 9.

Most of these students survive our current SMC.

But, it is very unpleasant for them, and costly to our schools and society.

3. Students who wish to study STEM subjects. This is where our current Standard Math Curriculum is most deficient. This is explained in Chapter 6. You need to understand STEM Math to fully understand this situation.

This is a HUGE TRAGEDY today.

This is why our students are at such a disadvantage when competing with students who are properly trained with modern technologies.

This is the reason Homeschool Math can be vastly Superior to Public School Math. No doubt this will be a very controversial statement, but to anyone who really understands STEM Math requirements, it is obvious.

Think what the consequences for our economy and society are.

So, just in case you have not read the previous Chapters, here is a quick synopsis of the situation.

The Standard Math Curriculum is the Culprit as explained as follows:

First, “. . . is too compartmentalized”.

Our modern math curricula divide math into a variety of subject areas called “precalculus math” including: Prealgebra - - - Algebra - - - College Algebra
Plane Geometry - - - Solid Geometry - - - Trigonometry Analytic geometry - - -
Finite Math - - - Etc.

This division has its roots in the 19th century math curricula and has not advanced much in the sixty years I have been involved with mathematics, as student, teacher, and mathematician. “Evolution” not “Intelligent Design” ?

The student is left with the impression that these various subjects are somehow independent areas. This is a horrible misconception, unfortunately shared by some teachers who are often forced to “specialize” on one or two topics.

These subjects are intimately related and interconnected, as any good mathematician would tell you. It is difficult to solve many modern practical problems without invoking concepts and techniques from several of these areas simultaneously.

The sooner a student realizes this and achieves a basic mastery of several of these topics, the better. A student needs such a Foundation as early as possible. And, it is possible in about one year thanks to modern technologies and a modern curriculum like Workforce Math.

Let me give you a quick example. Find the area to two decimal places of the triangle whose sides measure 3.00 ft., 4.00 ft., and 6.00 ft. The Answer is 5.33 sq. ft. This is the type of problem that could arise in a practical situation. Looks easy, but it is not UNLESS you are properly trained and can use a Scientific Calculator. We do this in Tier 2!

The usual area formula from geometry is not applicable. You can solve it with algebra and geometry (simultaneous quadratic equations), but this is tedious and difficult, especially without a calculator. You could apply Heron's formula if you knew it.

A good solution is to use some trigonometry and a calculator. Then it can be solved in less than a minute by any Practical Math Foundation, Tiers 1 and 2, graduate. And, it is just as easy to find the area of any other triangle with three known side lengths.

Try 13.5 in, 16.8 in., and 25.6 in. Answer. 102.9 sq. in.

In the standard high school math curriculum this problem probably would not be presented in a geometry class. Problems are rigged to be solvable with the limited tools presented there. Give this problem to any high school math graduate or teacher and see how long it takes them, if they don't just give up.

So practical problems such as this may require up to three years of math courses to solve, and this is just one of many such examples. This is simply unacceptable considering how unnecessary it is. It's quite unfair to the student.

In a modern curriculum these various subjects should be taught in a tiered or layered manner so the student can realize their interconnections very early on, say within three months.

For example, in the Tiers 1 and 2, basic facts and techniques from Algebra, Geometry, and Trigonometry are all presented so the student can see the interconnections very early on, and solve many practical problems quickly and easily.

It takes all three of these subjects to accomplish this. The Practical Math Foundation takes a student about forty hours (+/- twenty hours) to complete over a one to three month period.

The modern Tools should be introduced and used as early as possible. They make the understanding of the Concepts much easier, and the solutions of the problems much easier too, which any Employer will demand.

The Scientific Calculator needs to be introduced and utilized very early. Learning the old manual algorithms one will never use are a serious impediment to learning math.

Wolfram Alpha. This is the amazing 21st Century Tool (2009) that revolutionizes how Algebra, Analytical Geometry, Trigonometry, Calculus, and much more should taught today.

This is the CRITICAL DEFICENCY in the Standard Math Curriculum.

If course, it requiries the creation of a whole new Math Curriculum as we have done in Tiers 1,2,3,4,5 and 6.

Wonder why the Math Ed Community has not done this yet?

You tell me.

Could it be the Huge Investment in the Standard Math Curriculum?

No expensive books.

Online Teachers.

Coaches at the local level.

Revolutionize the Standard Math Tests to take account the needs and goals of the three distinct categories of students.

Hopefully, the Homeschool Tribe can lead the way by demonstrating how successful this 21st Century approach can be compared to the obsolete horribly expensive and ineffective SMC.

Supra

which means Beyond.