How & Why...

PUBLIC SCHOOL MATH is DESTROYING THE USA

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Chapter 21: Math Tools and Student's Future Success

Tools Tools Tools Tools Tools . . . .

Our Lives and our Civilization depends on the Tools we have and can use. Tools to start and control Fire! The First Tool for Civilization?

Hunting Tools - Transportation Tools - Building Tools - Science Tools.

That's the Sapien Story isn't it?

David had a more modern Tool than Goliath did and what happened? Goliath was actually the "underdog" in the fight with David, who won the battle thanks to his superior tool, the Sling. It was like using a Gun to fight a person with only a Sword. Goliath never had a chance.

Language was the first Tool we needed to communicate. It probably came before Fire or Hunting Tools. Math is a Language. Without this Tool there would be no Sapien Civilization.

A professor once told us that the first number system was:

1 , 2, 3, Heap. (from Cavemen?)
Later came 1,2,3,4,5, . . . Infinity (Greeks and other ancients)

Then came 1,2,3,4,5, . . . Ao, 2^Ao = c, 2^c, 2^(2^c), . . . (Math in the late 1800's.)

Ao is Aleph Null, the Infinite Number Size of the Set of Natural Numbers and Set of Rational Numbers

Size of the Set of Irrational Numbers and Set of Real Numbers is c = 2^Ao which is a larger Infinity Size.

So, lots of Sizes of Infinity.

Indeed, an Infinite number of Infinity Sizes.

OK. Math Tools

The simplest Math Tool might be the + Tool.

2 + 5 = 7 "=" means the same size or same number of elements in a set.

Then came the x Tool 4x3 = (3+3+3+3) = (4+4+4) = 12 = 10 + 2

This is what we teach our young children today in the USA.

To start, the easiest thing might be to memorize the + and X tables 1, . . ., 12

Then there are Algorithm Tools. What?

The ways or processes we teach students to add large numbers or multiply large numbers or do many other things with Math Concepts.

Then comes / or division. 15/3= 5 11/4 = 2.75

Then squares. 3 squared = 3^2 = 3x3 = 9

Then comes square roots. Square root of 9 = 9^(1/2) = 3

Then Powers. 3^5 = 3x3x3x3x3 = 243

But, what about 1.2^6.7 = 3.39?

Impossible without a more powerful tool.

So we invented Logarithms, the Inverse of Exponentials. This calculation was difficult, but possible, when using a Manual Tool called Logarithm.

MUCH Quicker and easier with the y^x Key on a Scientific Calculator like the TI-30Xa. 10 Seconds compared to 10 Minutes or longer.

Our ancestors created a plethora of Wonderful Manual Tools. Logarithms Tables and their Inverses Exponents. Trigonometry Tables. Slide Rules or Slipsticks, long linear or round. With these Tables/Tools we could solve very difficult Number and Geometry Problems. These Tools were all Manual. Both Difficult to Learn and Master.

But Powerful in solving certain Math Problems that came up in Technical Situations, Economic Situations and War Situations, etc.

Compare them to the Manual Carpentry Tools of the 1700's and 1800's. That's when many of the Math Manual Tools were invented or created. Wonderful, and empowered Sapiens to build wonderful structures. Our ancestors were geniuses and we owe our modern Civilization to them.

Question: Would you want to use these Manual Tools today to build a house?

All of the Manual Tools from the 1700's and 1800's for doing all sorts of arithmetic calculations are now superseded by a $10 Scientific Calculator.

How many Employers will pay you to do arithmetic calculations with the old Manual Tools? None, I know of.

Why? Very time consuming and Error Prone. IF you can even do it. These Manual Tools were HARD TO LEARN and MASTER.

For Example: What is (1.2 + 5/9)^5? Do it manually.

This is possible. How long and hard was it to do it?

Answer: 16.68 I just did it in 20 seconds with a TI-30Xa Scientific Calculator and I'm an old slow guy. My students are much faster.

SO, I believe that the first thing we should do is teach a student the Concepts of + and – and x and / with simple easy problems so they understand the Concepts. Then teach them to use the modern tool of a Scientific Calculator.

Once they learn one Calculator, it will be easy to learn another one. Ultimately, they probably will use one on their Smart phone.

To learn how to make dealing with Fractions very easy, or to Master the TI-30Xa Scientific Calculator, go to the Special Offers on p. 163.

There you will learn about two Online Courses to do either of these things very cost effectively in terms of both time and money with No Risk.

Once a student Masters the TI-30Xa Scientific Calculator, which takes most post-elementary students only a week or two, then the student is ready to learn:

PRACTICAL - Algebra – Geometry - Trigonometry in about one semester. That is if you use SPIKE Pedagogy to teach it. (See Chapter 26) And… Proper Content. This is Tiers 1 and 2 in Triad Math's Six Tier Math Program.

Now the student is ready to learn many Technical Subjects and Processes, and enter an Apprentice Program or the Military.

The Student who understands Tiers 1 and 2 will know more math than 95% of USA Public High School graduates. That is how bad our Public Schools have FAILED our Students.

In Less than one year around the 8th or 9th Grade, all students should learn:

PRACTICAL -
Algebra – Geometry – Trigonometry

To see how this is possible, go to the Special Offers on p. 163.

Then the Student will have a great Foundation to continue learning more advanced Math for Consumer things and then STEM subjects. Also, the Student will have "Learned to Learn." The Student will have great Self-Confidence and Self-Esteem.

Are any Public School Math Programs doing this?

That is why this book's Title is: *Public School Math is Destroying the USA*.

I consider it a "Sin" not to teach our Students Proper Content like this.

Furthermore, for future College Students and STEM students, the Fun has just begun!

An Incredible 21st Century Math Tool (2009), named *Wolfram Alpha*, does for ALL PreCalculus Subjects, Calculus, Differential Equations and All STEM Math MUCH MORE than the Scientific Calculator did for Arithmetic.

Amazing. *Wolfram Alpha* still seems like a Miracle Tool to me.

Now, a future STEM student can learn STEM Math in a couple of years.

The difficulty level of Calculus has gone from an 8 down to a 2 on a scale of 10 with 10 being the most difficult..

Integral Calculus and the application of the Fundamental Theorem of Calculus, which requires finding the Antiderivative of a Function, has gone from a Math Barrier of difficulty 7 or 8 to a very easy Path with a difficulty of 2. This is why I teach Wolfram Alpha extensively in Tiers 4, 5 and 6.

Does ANY Public School teach such a modern 21st Century Math Tool? Does any Public School teach STEM students Differential Equations, the workhorses of STEM?

… *Destroying the USA?* What do You think?

In Tier 3, I still just use the Calculator since you cannot use Wolfram Alpha on the SAT or ACT. Those, in My Opinion, are horrible tests our Public Schools teach for, and they really prove very little. Maybe they prove which students can afford Tutors or extra help to pass them.

What's Your Opinion?

Look at the Six Tier Syllabus in the Appendix to see one Math Program that teaches a Student Proper Content utilizing SPIKE Pedagogy.

Compare any other Math Program to it.

Eliminate inappropriate Theoretical Concepts, Obsolete Manual Tools and Deliver your math lessons using SPIKE Pedagogy.

That will prove to be very successful 21st Century Math that virtually all Students will benefit from.

The Proof is in the Pudding, and any family can start all of their Students down the Six Tier Path for only $29/Month.

Go to the Special Offers on p. 163 to learn how.

Very little to lose, and much to gain.

A Convex Option according to Nassim Taleb.

This will be explained in the *Dr. Del's "Fun with Math" Club* you will be an automatic member of.

The whole Mission is to demonstrate what Public Schools COULD DO!

. . .Vastly Improve the USA!

Chapter 31: STEM Math - PreCalculus

STEM = **S**cience **T**echnology **E**ngineering **M**ath.

Historically STEM MATH has been a huge Barrier for any Student interested in Science or Engineering.

PreCalculus consists of Algebra, Geometry, Trigonometry, Complex Numbers, Analytical Geometry and Trigonometry. This is at a much deeper level than Practical Algebra, Geometry and Trigonometry.

The Concepts are actually not too difficult for most potential STEM students. However, to do anything with these Concepts, you have to learn to solve problems that they create with these Concepts. That's the real Challenge.

Our brilliant, genius ancestors created a Plethora of Wonderful Manual Tools to solve these problems. Incredible Manual Tools. Newton, Leibniz, Euler, Guass and many others really gave us our Modern Civilization via the Science and Technology they created.

Only ONE Problem!

Most of these Manual Tools are very difficult to learn and master. Plus, they are very difficult to actually apply. It takes a very gifted person and lot's of Hard Work. It’s a Huge Barrier for most Students.

Sadly, these Manual Tools are still being taught to our Students in our Public Schools today. No, it's more than Sad.

It's Sadistic. It hurts our students, even the successful ones, and “kills" many weaker students.

Why is this so Bad?

Because there are Powerful Modern Tools that are Much Easier to Learn, Master and Apply.

It started with the HP-35 Scientific Calculator 50 years ago, in 1972. I've told this story elsewhere. It made arithmetic calculations Much Easier.

But, this Modern Math Tool, did not help very much with a lot of the PreCalculus Subjects, and very little with Calculus and Differential Equations, which are the Indispensable Subjects for Science and Engineering.

And, the Manual Tools for Calculus and Differential Equations are much more difficult to Learn and Master than the other Manual Tools. Then . . .

WOW!

In 2009, a Miracle Math Tool was released to the world that now makes solving virtually all STEM Math Problems VERY EASY. I call it a Miracle Math Tool because I still can't believe it Exists!

Yes, I have a Ph.D. in Math, (Algebraic Number Theory) so I'm not Too DUMB, but I can't even imagine How this Tool works. You'll just have to see it in action and experience it to even begin to appreciate it.

Its name is *Wolfram Alpha*:
https://www.wolframalpha.com/

Oh Yes, It's Free.

It's a creation of the brilliant genius Stephen Wolfram and his company Wolfram Research.

In Tier 4, I teach STEM PreCalculus subjects using *Wolfram Alpha*. Just look at the Syllabus for Tier 4. (See the Appendix.)

Of course, each Lesson consists of a Tutorial Video (thus Interactive), Notes, Exercises, and Quizzes. SPIKE Pedagogy!

The Implications for a STEM student are even greater for the workhorses of STEM Math, Calculus and Differential Equations.

See the next two Chapters. They'll be mind-blowing if this is new to you.

Ask your favorite Math Educator or Teacher about *Wolfram Alpha*.

Oh Yes, would You like to see *Wolfram Alpha* in Action? Siri on the iPhone is an application of *Wolfram Alpha*.

Wolfram Alpha is a multi-million instructions Computer Program using the computer language Mathematica which Wolfram also created in 1988. It runs on some big Computer somewhere and is accessible via the Internet.

Steve Jobs bundled Mathematica with the Next Computer in 1988, and this was what Tim Berners Lee used to create the World Wide Web.

It took Wolfram almost 30 years, with an ever more powerful Mathematica, to create *Wolfram Alpha*, and Jobs used Mathematica to help create the iPhone.

Wolfram Alpha revolutionizes how STEM Math can be learned and practiced. It is not in any Math Textbook I know of being used by our Public Schools.

This alone is putting the USA at a great Handicap in STEM subjects.

To me, it is like teaching “Horse and Buggy” Math in a Tesla Automobile world.

What do You think?

Chapter 32: STEM Math - Calculus

Modern Math Models for STEM are based on what are called Functions.

PreCalculus introduces many of the common Functions used in STEM Math Models: Polynomials, Rational Functions, Trig Functions, Exponential Functions, their Inverse Functions, Composite Functions and Special Functions (Infinite Series).

You try to Graph these functions to get a Pictorial Representation of them. To really study these Functions and determine their behaviors, you need a Tool called Differential Calculus.

Then you can find Maxima, Minima, Inflection Points, Roots, Asymptotes, regions of increasing and decreasing and concavity. Not Easy, but not too hard if you stick to problems that are doable. Impossible Manually for some problems that arise in STEM subjects.

This is usually what is called Calculus 1 in most Schools and Universities. Most Students can learn and master it with reasonable effort.

THEN, you need to find the Area under the Graph of a Function.

This plagued our ancestors for thousands of years and a Tool to solve this Problem was invented, or discovered, in the 1600's led by Newton in England and Leibniz in Germany.

This Tool is named the Fundamental Theorem of Calculus, or FTC. It leads to Integral Calculus, which is usually taught as Calculus 2. There’s only One Problem.

The FTC is often very difficult to apply.

In Differential Calculus, you must find what is called the Derivative of a Function, and this is fairly easy to do with various Rules. A Level 2 or 3 Difficulty on a scale of 10.

In Integral Calculus, you must find what is called the Anti-Derivative of a Function, and this is often very difficult, or impossible to do. Thus, Integral Calculus is probably a Level 8 on a difficulty scale of 10

Integral Calculus is a Huge Barrier for most future STEM Students that must somehow be transcended. Many potential STEM Students fail and/or just give up.

Guess what?

Wolfram Alpha solves both Differential and Integral Calculus Problems automatically and immediately. With this Tool, Calculus is now a difficulty of about 1 or 2 on the scale of 10.

You can learn both Differential and Integral Calculus in about one semester and Much Better since you can do many more problems in a given amount of time. It's really doing these problems, and yields a deep understanding of the Concepts of Calculus.

Today the Calculus Barrier has a Huge Tunnel through it. *Wolfram Alpha*.

This is what I teach in Tier 5.

To not teach this 21st Century Math Tool, or an equivalent one if there is one, is in my judgment Criminal. It is Criminal to deprive potential STEM students of an educational path through a Now Obsolete Math Barrier.

Just go to https://stemmathmadeeasy.com and take the STEM Math Challenge.

Have any Public School Graduate with an A in Calculus go take this STEM Math Challenge. For that matter, ask any Calculus Teacher to take the Challenge.

It's so sad Math Educators… but ALL of your current Calculus Books are Obsolete.

Sorry Kodak and Polaroid… but Cameras that use Film are Obsolete.

This is a major reason Public School Math is Destroying the USA!

We must have great Scientists and Engineers and we can't keep importing them from countries that are teaching a better version of STEM Math.

Of course, I can't use any current Calculus Textbook because they all teach the old Manual Tools and not *Wolfram Alpha*.

So, in Tier 5, it's Tutorial Videos, Notes, Exercises, Quizzes and a Forum using *Wolfram Alpha* from the Get-Go!

Both Differential and Integral Calculus usually take one of my STEM Math students about One Semester to complete.

Now we can teach another important STEM Math Subject that is not taught today in a Public School because it is even more difficult than Integral Calculus, which itself is too difficult for most Schools.

Chapter 33: STEM Math – Differential Equations

The Workhorses of most STEM subjects are called Differential Equations.

A Differential Equation, or Diff Eq, is a Math Model of some Physical Process.

The Solution of a Diff Eq is a Function. Then you use Calculus to analyze the behavior of the Function. This is how you understand the Physical Process by analyzing its Math Model.

Now, the Solution of a Diff Eq might be a familiar function, but often it is what is called a Special Function, which is an Infinite Series Function.

Solving a Diff Eq is often even more difficult than solving an Integral Problem. Probably a difficulty of 9 on the 10 scale. Indeed, applying the Fundamental Theorem of Calculus involves solving the simplest kind of Diff Eq to obtain the Anti-Derivative Function of a Function!

OK. Guess what?

Wolfram Alpha solves any Diff Eq automatically and quickly. Easy – Peasy!

And, if there is not a solution with any known Function or Special Function, *Wolfram Alpha* will give you a Numerical Graphical Solution.

Oh yes, if you use *Wolfram Alpha Pro*, or *Wolfram Alpha* on the SupraComputer, then it will also show you a Step-by-Step Manual Solution, if one exists and for some reason you want to learn it.

You can learn about the SupraComputer at:
https://supracomputer.org/

or go to: www.CraigHane.com/book to get there too.

What makes it "Supra" is that it comes bundled with *Wolfram Alpha*, and an even more modern 21st Century Computer Language called Wolfram Language, which is an easy to use version of Mathematica.

Diff Eqs are what I cover in Tier 6.

A Student who works reasonably hard and is reasonably intelligent can Learn all Six Tiers in two to four years, depending on their background.

IF I were going to send a Student of mine to a good STEM University, I would be sure the Student had mastered all Six Tiers first.

Until Public Schools do this, I will tell it like it is.

They are Destroying the USA.

Special Offers

Go to www.TriadMathInc.com/SO for the current Special Offers.

Dr. Del and Triad Math, Inc. like to give students and families actual training so they can evaluate the methods our Programs use to determine if they would then benefit from some of our training products.

Seeing is believing.

Your experience is the only one that counts for you.

So, go take advantage of our current Special Offers.

Dr. Del wants the best for you and your family.