How & Why...

PUBLIC SCHOOL MATH is DESTROYING THE USA

By Craig Hane, Ph.D. aka Dr. Del

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 25: A Sales Pitch – A 21st Century Solution

Any School, Public, Private or Homeschool, can deliver an Optimal Math Education for ALL Students in 2022 thanks to many wonderful technologies, some less than a decade old.

My wish is that this book will stimulate such a transformation.

Unfortunately, I am doubtful Public Schools will make such a radical transformation in the near future due to political and financial considerations the Math Education Leaders will not overcome soon.

For example, ALL current middle and high school Math Textbooks are obsolete.

In the 21st Century Solution, the Math Textbooks for each student will cost less than $5.

Hmm! What does this do to the Math Educator Authors and Book Publishers financially? They go the way of Kodak and Blockbuster. I can understand their resistance and why they probably will condemn and criticize this book.

Maybe some independent Private Schools will make the radical transformation to an Optimal Solution. Hopefully, they will lead the way for Public Schools to make the transformation.

Fortunately, Homeschools are beginning to do so, and are enjoying MUCH Success with an Optimal 21st Century Solution that we have created and are delivering.

Homeschools may lead the way for Private Schools.

But, what is more important for You, dear Reader, is what We can do to help Students even though they are going to a Public or Private School. You should understand what we can do from the information in this Part V.

Part V is an Overview of this 21st Century Solution. It will be based on a brief explanation of Triad Math's Six Tier Math Program.

Yes, this is a "Sales Pitch" for You to help any Student that you can to obtain an Optimal 21st Century Math Education for that Student.

IF you can find a better Solution, I will be the first to cheer for you. Please let me know if that should happen.

Meantime, Educate yourself and then other Parents and Students about what you will learn in Part V.

Onward to SPIKE!

Chapter 26: SPIKE Pedagogy – A Critical Ingredient

You may learn more about SPIKE Pedagogy in Chapter 1 of another book I have written, *How and Why Homeschool Math can be vastly superior to Public School Math*.

You may get a copy at: www.CraigHane.com It is Free.

Chapter 1 is both a 19-minute Video and/or a PDF to read. So, you get an Audio/Text choice.

This Book could have been titled, *How and Why 21st Century Math Education IS Vastly Superior to 20th Century Math Education*.

Here is a brief Overview of SPIKE Pedagogy:

Self Paced – Each Student must learn Math at the Student's own Pace. This is virtually impossible in any synchronized Classroom. But it is very easy to do with Tutorial Videos along with Notes, Exercises, Quizzes and a Forum for questions.

Proper Content – Always be sure the Student has the necessary Prerequisite Math Knowledge for the current Topic being taught. Review when necessary.

Interactive – Math is learned 'by doing', and must be very interactive with both the Coach and Student.

In Triad Math' Six Tier Program, Dr. Del is the Tutor via Tutorial Videos delivered from Amazon Web Services through a Learning Management System, along with a Student Forum to ask questions and get answers.

The Coach can be anyone who is capable of Coaching. We have training on how to do that in Chapters 7, 8 and Addendum 3 in the *How and Why . . .* book mentioned above.

In many Homeschools, the Coach is the Parent or an Older Student. The Coach does not have to know the Math.

Keeping Score – The Student's Progress needs to be recognized and celebrated. This is accomplished via the Learning Management System and the Coach.

Never compare two students since one will always be faster or ahead of the other student. Recognize each Student's Progress. This helps build Self-Esteem and Self-Confidence.

Learning Math is also “Learning to Learn” that can then apply to many other subjects too, as well as 'Learning on the Job' later in life.

So it's a Double Whammy. Learn Math and Learn to Learn.

Empathy – A Student will make a lot of Mistakes. This is necessary to learn Math and we all do it. Celebrate Mistakes as Progress and evidence of Effort. We learn from our Mistakes. Humor helps too. Laugh at your Mistakes!

As I learned over many years as both a Student, a Tutor and a Teacher, SPIKE Pedagogy is the best, and for many students, the only way to learn Math.

Unfortunately, it is very difficult to achieve SPIKE Pedagogy with a Group of Students in a Classroom on a Schedule.

It is NOT the Teachers' fault. Students have very different abilities and prerequisite math backgrounds along with personal life situations. They will work at dramatically different paces for many reasons.

Review is necessary for most Students since we all tend to forget something we learned if we don't use it a lot right away.

Thanks to modern technologies You can deliver Math via SPIKE Pedagogy to any Student very cost effectively.

An expensive Tutor might work if you can afford it and find a good one, but you can also use Dr. Del via his Tutorial Videos for a few cents per hour.

Warning! SPIKE Pedagogy is necessary, but NOT sufficient for an Optimal Math Education.

You must also have Proper Math Content beyond what is required by SPIKE Pedagogy, which as you will learn in later Chapters, is very different from what is currently being taught by our Public Schools.

So, Onward to learn all about Proper Math Content in this 21st Century.

It's truly amazing!

Indeed, for advanced STEM Math, it seems like a Modern Miracle!

Chapter 27: Proper Math Content – A Six Tier Online Math Program

Proper Math Content for post-elementary Math is a Controversial Subject. Over the last hundred years, our Math Educators have evolved what I call the Standard Math Curriculum, or SMC, consisting of Math Content. Mathematics is a Huge Subject, like Music or Literature. No one Person can ever understand or learn All of it.

So, just what Math Content should we be teaching our students? I believe that Proper Math Content should include Math Concepts, Tools and Skills that will be of great value to the Student in the Student's future Life.

DO NOT burden the Student with theoretical concepts the Student will never use or be interested in, and, DO NOT force the Student to learn old Manual Tools our ancestors had to use before the Modern Tools created with today's Technologies.

WOW! That's a lot to think about. To many Parents and Students, Math is like a big Black Hole. After all.... Math is Math!

Wrong! One Set of Math Concepts and Tools can be VERY DIFFERENT than another Set of Math Concepts and Tools. It's like comparing Rock and Roll music to Gregorian Chants. After all.... Music is Music!

The Math Concepts included in the SMC taught by Public Schools today have accumulated over the last 150 years, sort of by evolution. Whether they really teach it or not, the SMC includes a lot of premature and inappropriate Math Concepts. Some are premature Theory, and some are Obsolete Manual Tools.

Of course, to a Layperson, this can be very confusing. The Math Tools the SMC still teaches includes many Obsolete Manual Tools our ancestors had to use that are now superseded by Modern Tools.

OK, what is a good Optimal 21st Century Math Program in terms of Content? Look at the Triad Math Six Tier Program Syllabus in the Appendix of this book. Then, you can compare this to any other Math Program. Of course, If you don't know much Math this won't mean much to you.

In the next six Chapters I will give an Overview of each of the Six Tiers.

Tiers 1 and 2 provide a Foundation in Practical Math for All Students.

Tier 3 is for College Bound Students getting prepared for the SAT or ACT tests, and also learning some Consumer Math and Quantitative Reasoning and Logic.

Tiers 4, 5 and 6 are for STEM Students.
Science **T**echnology **E**ngineering **M**ath.

This is Revolutionary because of an amazing 21st Century Math Tool introduced to the world in 2009, which truly revolutionizes Math for STEM Students. I think of it as a Miracle Tool. It is so difficult to believe all the Math it can do, as well as how easy it is to learn and use!

Best of All... virtually any Student can learn this new 21st Century Math on the Student's own time. This new found knowledge will be a great supplement and help in the SMC Math Program the Student's School is teaching.

Plus, a Student can try it out for No Risk financially, as you will learn, in several different ways, depending upon the Student's unique situation.

Chapter 29: A Foundation for All Math Students

Let's suppose a Student has mastered using the TI-30Xa for performing arithmetic calculations. Much better than the old difficult to learn, error prone, time consuming, manual arithmetic algorithms.

So what? What are you going to do with this new found ability?

How about solving practical problems that come up in 1,001 technical fields like landscaping, cooking, carpentry, mechanics and on and on?

What Math is required for this?

Algebra and Geometry and Trigonometry – Practical, not Theoretical.

How long do you think it will or should take to master these Three subjects?

Well, thanks to the Scientific Calculator and SPIKE Pedagogy, the answer is:

ONLY About One Semester. About 60 Hours for most Students.

Self-Paced with a lot of Review, it can be done in about 60 Hours in One Semester!

Do you know any Public Schools teaching this? I would be delighted to learn of one. Of course, I would also be delighted to help a School do this.

Anyway, to learn more about how any Student can achieve this go to Special Offers on p. 163.

How many Lessons?

10 Algebra lessons
19 Geometry lessons
8 Trigonometry lessons

Algebra isn't of much use just by itself. But it is wonderful when applied to other fields. People just don't realize they're using it. For example, in baking, doubling a recipe is essentially using algebra. Fields such as chemistry use a lot of algebra without using geometry or trigonometry.

When you combine Practical Algebra with Practical Geometry, you can solve all sorts of practical problems in many technical fields.

Why Trigonometry? Isn't it advanced and difficult?

Well, with Algebra and Geometry you can solve a lot of practical problems and even some involving a few special angles. But, you cannot solve many problems involving angles. There's just not enough Concepts and Tools! Yet.

Trigonometry is like an extension of Geometry that now empowers you to solve problems involving angles too. And Practical Trig is easy with the Scientific Calculator to do the Trig arithmetic.

Quick example. Take a Triangle, maybe a flower bed plot or a bird feeder side, with three sides of 8.6 U, 12.4 U and 16.7 U where "U" is some unit of length.

What is the Area of this triangle, and what are the measures of its three angles?

After learning Practical Trig, you will be able to solve this in less than a minute. Easy-Peasy. In fact, you will be able to solve this in two different ways to be sure you didn't make a careless error.

This is my One Question Quiz to see if an applicant knows practical math.

Answer: 103.9 deg opposite the 16.7 U side, 30.0 deg opposite the 8.6 U side, 46.1 deg opposite the 12.4 U side and the Area = 51.8 Sq U.

How much does the program cost?

Go to Special Offers on p. 163.

A Sales Pitch?

You bet! Why?

If I were a Student going to any School, then I would want to do this on my own.

Chapter 30: College Prep and Consumer Math

I consider the standardized tests SAT and ACT to be Horrible Tests. They are timed tests and only allow some basic calculators like the TI-30Xa. Taking a timed test clearly puts some students at a disadvantage, even if they know and understand the Math being tested.

These tests are designed to get a Bell Curve, see Chapter 22. The tests have several very easy problems, a few moderately difficult problems and a few very difficult problems. Indeed, a few difficult problems that a person cannot solve unless a "tricky" process, fact or solution is known.

I have a Ph.D. in Math and when I took a Sample SAT test, there were two problems out of twenty that took me many minutes to figure out how to solve. Certainly not enough time in the allotted twenty minutes. Because of this, I would have scored fairly low on the test.

However, once I learned the tricks, if I retook a similar test, I would have scored very high. Probably still not perfect since I tend to make a lot of careless errors. The test score has very little to do with my Math abilities and knowledge.

Indeed, there are many SAT Prep services and Programs that help a student learn how to solve the tricky problems quickly. So Parents who can afford such Programs will have their Student prepared to score higher than a Student who cannot afford such a program.

Graphing Calculators are obsolete today, but there are Tools on any Smartphone that solve many Math Problems easily and the way a modern STEM Pro would.

Then, there is the psychology of the student when taking a test. That alone can cause a very poor score.

There are also a bunch of Math Topics that are of no interest or value to a student who is not interested in STEM. But, gotta learn 'em to get a Scholarship or go to a good school, unless your parents can get you in some other way.

In Tier 3, I teach these topics to help a student be better prepared for these tests. After all, it's the System. Also, I try to give them some psychological counseling regarding test taking.

There are also some topics in Tier 3 that may be of interest to some folks for other reasons.

Believe it or not… A student can score very high on either of these Standard Tests and NOT be prepared to compete with a properly trained student in any STEM subject at a good University.

You will see why in the next Chapter. Yes, Unbelievable, and Unconscionable.

It involves an amazing 21st Century Math Tool that revolutionizes STEM Math, and these tests will not allow a Student to use this Tool on a test.

It's like making a Student take a test on carpentry, but not letting them use any Power Tool. They can only use Manual Tools from the 18th century, and some of them are very tricky to use without a lot of preparation.

This is one reason I believe that Public School Math is Destroying the USA, handicapping our young students and discouraging them by testing on inappropriate topics.

It keeps them from pursuing a technical career that would be very productive for them.

Math Educators… PROVE ME WRONG!

Parents… Save Your Students from the Public School's Standard Math Curriculum!

And, IF you have a Student who just might be interested in some Science or Engineering subject, the next Chapter will be the most important Chapter in this book for You.

Very Inspiring!

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.