

DR. DEL'S

GOLDEN RULE MATH

FOR

Successful Math Students

**21st Century
Math Education
for 21st Century Math Students**

Craig Hane, Ph.D.

Dr. Del's

Golden Rule Math

for

Successful Math Students

21st Century Technologies and Tools

Revolutionizes and Transforms

21st Century Math Education

for All of Our Wonderful

21st Century Math Students

Delbert Craig Hane, Ph.D. (Math) aka Dr. Del
Founder and CEO, Triad Math, Inc.

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Introduction – A Typical Homeschool Story

A call came in to Dr. Del from Claudia, a homeschool parent.

“Dr. Del, I’m a homeschool parent with a child, Cody, age 13, who has been successful with math so far.

“I have been able to teach him math up to this point entering 7th grade.

“But, I am way over my head going forward and I’m really worried about going forward.

“Personally, I have never liked algebra or other more advanced math subjects very much.

“I am looking at several different math programs, and don't really understand any of them.

“I'm afraid I might hurt Cody if I'm not careful.

“Can you help me?” asked Claudia

“Yes,” answered Craig.

“I'm really glad you haven't led Cody down the wrong path and turned him into a struggling student, as often happens post-elementary.

Successful Students

“This book will tell you what you can, and should, do to keep Cody successful.

“You will be Cody's coach.

“Someone else will be his math teacher.

“Maybe it will be me :)

“But, whoever it is, it is very important that you teach Cody the proper content and teach with what I call SPIKE Pedagogy.

“Thank God, with some wonderful 21st century technologies, this is possible today.

“So read this book, and then do the right thing for Cody.”

was Dr. Del's full answer.

Success?

Chapter 1: Success?

Success?

What is “success” in a subject?

Here is some “food for thought”.

In school, success might be defined as getting a high grade in a subject.

A high grade is what I call an Extrinsic Motivator.

Read Chapter 5 to understand Extrinsic and Intrinsic Motivators.

Suppose you are studying a subject you do not enjoy and also do not see any value in for your future interests or endeavors.

Then a high grade certainly is an Extrinsic Motivator.

If you enjoy learning a subject, then that is an Intrinsic Motivator.

If you believe learning a subject will be of value to you in pursuing your other interests, then you may define that to be a “good” Extrinsic Motivator.

“Good” Extrinsic Motivators are great.

Successful Students

However, I believe Intrinsic Motivators are even greater, and desirable.

What if you get a good grade by simply scoring higher than your classmates, but don't really understand the subject.

Is this success?

Absolutely not by my definition given below.

But, it did satisfy your Extrinsic Motivator.

I call it a “bad” Extrinsic Motivator, all too common in some schools.

You must decide which Extrinsic Motivators are desirable or not.

You have to decide what Motivators you value and will work for.

Dr. Del's Definition of Success in studying Math.

First, there will probably be 'good' Extrinsic Motivators.

The one I think is best is the student's belief that the math s/he is learning will be of value when learning other subjects the student is interested in.

It is the teacher's and coach's job to teach that to the student in addition to teaching the proper math content to achieve that goal.

For example, practical math will be valuable in pursuing many technical subjects, either for careers or hobbies.

Consumer Math will be valuable for many things in life.

Success?

STEM Math will be valuable, indeed necessary, to learn various STEM subjects.

All “good” Extrinsic Motivators to learn certain appropriate math topics.

Second, Intrinsic Motivation is the best of all.

That means the student enjoys learning and doing math for satisfaction, like the student would get from some sport or game or music or other activity the student likes to do just for the enjoyment and satisfaction.

For this, Proper Content and SPIKE Pedagogy are both quite necessary.

We usually enjoy an activity where we are successful after putting in various efforts.

In the chapters on Proper Content and SPIKE Pedagogy, I will explain how 21st Century Technologies make both of these possible.

WARNING! Just because a student is successful in math right now is no guarantee that won't stop IF the student hits some math barrier.

Indeed, that happens to many students at some point in their educational career due to some improper content OR some improper pedagogy.

Indeed, it happened to Dr. Del in the 9th grade, and Grace Libman in the 1st grade. See the book *Golden Rule Math for Struggling Students* for Grace's story.

For Dr. Del's story just read Chapter 6.

No student or parent wants that struggle to happen.

Successful Students

To be sure that does not happen, always teach proper content to your student, and practice SPIKE pedagogy.

For most parents, that becomes quite challenging after elementary school, if not before.

All the Golden Rule Math books explain how to never let that happen.

There is one online math program this book will tell you about where the parent can be a great coach, and Dr. Del can be a great teacher. See Chapter 7.

You may test it out for free at no risk by using one of the special offers pointed to below.

Proper Content and SPIKE Pedagogy are the two Key Ingredients.

And, thanks to some 21st century technologies, this math program is also quite inexpensive, both in terms of both the parent's and student's time, and money.

So, be sure to take advantage of one of the Special Offers you will receive with this book.

Math is no longer a barrier or a problem for homeschoolers.

Indeed, math will be fun for the student.

More importantly, math will prepare a student for 1001 career paths and hobbies.

Obviously, this is what all parents want for their children.

Today, in 2021, it is now possible.

Chapter 2: Proper Content

This is the proper content for all math students, whether they have been successful in their math studies or not.

If you, a student, don't understand the decimal number system, have your parent teach it to you by following the Uncle Jack videos.

Once you understand numbers, learn to use the TI-30Xa scientific calculator to do your arithmetic calculations and be sure you understand the Rules of Arithmetic.

This is all covered in Tier 1 of Triad Math's Online Program.

Most students find this very easy and fun, and do it in a couple of weeks.

It is self-paced and will take varying amounts of time for different students.

When completed, the student will have a skill possessed by very few USA adults.

And, the student will be well prepared for Practical Algebra, Geometry, and Trigonometry which will now be easy to learn in Tier 2.

Tier 1 is absolutely a prerequisite for Tier 2.

Successful Students

This alone makes the Triad Math Online Math Program quite different from any Standard Math Curriculum Program, and in our judgment, vastly superior.

[Parent: Pay close attention to the Coaching Principles and Guidelines. You will be using them for all of the Tiers to come. See Chapters 4 & 5.]

Now go on to Tier 2:

First, learn Practical Algebra Tier 2 10 Lessons

Second, learn Practical Geometry Tier 2 19 Lessons

Third, learn Practical Trigonometry Tier 2 7 Lessons

“Wow, all of this in only 36 Lessons?!”, ask most students and parents.

You, the student, probably will be able to complete Tier 2 in two or three months if you will work a little on most days, say 30 minutes to an hour, five days a week.

See Chapter 5 and learn to coach yourself!

You will watch the tutorial videos to learn the topics and how to do the exercises.

Stop, back-up, rewatch the video until you understand the topic.

You are the boss on your own self-paced time schedule.

You control the tutorial video.

You add to your notes that follow along with the video.

Best to have them printed out before you watch the video.

Proper Content

Then, do the exercises. That's where you really master the topic.

Most of your time will be spent doing exercises and reviewing.

Then take a short quiz to be sure you have mastered the topic.

Your ONLY grade will be an A.

Oh yes, go back and review a topic many times in the future until you really remember it.

After all, here today, gone tomorrow is a problem for us all!

When you master Tier 2, you then will know more math than most adults in the USA and be ready for the military or technical workforce, or to study any technical field.

Here is my one question 'test' you will be able to answer that you can use to prove this!

It will impress many of your family and friends.

My one question test, which will prove you are now “Matherate” for the practical technical workforce, is you will be able to calculate, in less than one minute, the area of a triangle with sides of 8.3 in, 10.4 in and 15.4 in. Or, any other triangle.

The solution involves most of the things you have now learned, including practical Trigonometry and the TI-30Xa Scientific Calculator. Easy peasy!

Very few people can solve this practical problem!

Successful Students

It's a great way to challenge a “wise guy” with a friendly bet.

Let them choose the lengths of the three sides of the triangle.

Then find the area!

Have FUN!

(Answer: 40.5 sq. in.)

Note: A successful math student may already understand many of these topics.

Great, then this is a good review and will go very quickly.

But, it is imperative that the student know all of the topics and not miss any rungs on the math ladder.

A common way for a successful student to become unsuccessful is to try to understand a math topic the student does not have the prerequisite knowledge required to understand this topic.

Immediate Action Plan

See the special offers and take advantage of one of them.

The parent can be the coach. See Chapters 4 and 5.

Dr. Del is the teacher, available via the tutorial videos and learning management system 24/7 for less than \$1 per day. Maybe much less.

Chapter 3: SPIKE Pedagogy

Pedagogy means: “The method of teaching a subject”

SPIKE Pedagogy is wonderful for delivering an optimal math education to any student, *if you can do it*.

Any good math tutor knows this.

SPIKE Pedagogy is practically impossible to practice in a group environment.

Fortunately, parents can easily practice SPIKE Pedagogy for each of their children thanks to a modern 21st Century Math Program.

Any experienced math teacher or tutor will tell you there are five ingredients of good pedagogy for Math expressed by the acronym SPIKE.

So, what is SPIKE Pedagogy? S P I K E

Self-pacing. Each student will learn math at his or her own pace which is determined by many factors unique to each student.

It is difficult, usually impossible, for a student to have self-pacing in a group environment where the Math is being taught on a schedule.

Successful Students

Any good math tutor realizes this, and this is one reason why rich parents use good tutors to teach their children math, especially when they are struggling with math taught in a classroom to a group of students.

Indeed, that is how Dr. Del made a good living during his school years from ages 15 – 27, high school thru graduate school, and learned the value of SPIKE Pedagogy

Proper Content. A student should be taught Math in a sequence of topics so that the student always has the necessary pre-requisite math knowledge for each new topic.

Furthermore, it is desirable that the Math topics chosen are of interest and relevance to the student.

This is a horrible failure of our current Standard Math Curriculum taught in most Math Programs which include many obsolete manual tools and some premature theory.

An essential ingredient of proper motivation is to explain to the student how a given topic might serve the student well in the future given the student's larger potential interests in life.

Just realize that Math is a HUGE subject.

No single human understands or knows all of the Math there is.

Different people need different math topics depending on their broader interests in life.

Just like any language.

SPIKE Pedagogy

Indeed, Math is a Universal Language capable of expressing things no natural language can.

And, Math is Math anywhere in the world.

Interactivity. Math is like a sport or game.

To learn math, you must do (play!) math.

You must practice.

Do lots of math problems.

You will make a lot of mistakes.

You will struggle to overcome hurdles.

Fortunately, with the right attitude Math can be one of the most fun and rewarding sports or games you can ever play.

This is why the psychology of the student is so important.

The student must enjoy the sport or game of Math.

This is why having both a great teacher and a great coach is so important.

The teacher explains the Math and selects the proper topics for the student.

The coach guides and encourages the student.

Mistakes are celebrated as evidence of effort, just like in a sport.

Successful Students

Personal achievements are celebrated as the student climbs the ladder of Math topics.

The coach must be sure the student doesn't miss any rungs of the ladder.

The coach must be sure the student practices.

The coach should point out how Math might help the student in many arenas of the student's future life.

Keeping Score.

It is very important to keep score of a student's progress and recognize the student's progress and achievements, just like any game or sport.

This is an important responsibility of the coach.

Keeping Score is a powerful motivator for a student.

This is not a grade. It is climbing the Ladder of Topics.

The grade is always an A when a topic is mastered.

It is like ranks and merit badges in scouting.

Or, playing a game with one's self.

Climbing the Ladder of Success.

It is important to create and maintain a good psychology for the student.

SPIKE Pedagogy

Math can sometimes be frustrating for almost any student.

So says Dr. Del.

“I have a Ph.D. in Math, but I can tell you that many times I was frustrated.

“I probably have made more mistakes in Math than anyone you know.

“Remember, Babe Ruth was the Strikeout King, as well as the Home Run King.”

The Proper Math Content will vastly improve most students' lives.

Keeping score will prove this when you compare it to the student's other achievements, especially those that depend on a good Math foundation.

Empathy and Humor.

A good math student will practice a lot, and make a lot of mistakes.

When I make a mistake, I just chuckle a little, correct it, and go on.

If I make a big mistake I laugh out loud.

Life is funny and fun if you approach it right.

In your life you will make a lot of mistakes.

Indeed, mistakes are a sign of growth.

Successful Students

You learn from your mistakes.

It is up to you to decide how to deal with them.

This is very important if you want to maintain a good healthy psychology.

“I would not have earned a Ph.D. in Math IF I had not learned to laugh at myself and my mistakes,” confesses Dr. Del.

Summary:

OK, SPIKE Pedagogy is necessary for a good Math Education.

The facts are that it is very difficult to deliver the SPIKE Pedagogy for each student in a group setting of many students, which is how math is still being taught in many of our schools.

That is why Homeschool Math can be superior to Public School Math.

In a typical classroom, the teacher will be going too fast for some students and they will fall behind and FAIL.

Any grade less than an A is essentially failure.

You either understand a Math Concept or Tool, or you don't.

And, the teacher will be going too slowly for other students and they will become bored and frustrated. Bad for them too.

Grading on the Bell Curve is a HOAX.

SPIKE Pedagogy

Math performance is essentially bi-modal.

Either you understand a math topic, or you don't.

So, if a teacher tries to slow down as much as possible to keep slower students from failing, this then makes the Math boring for the faster students.

Also, note any student may learn one topic fast and another topic slow.

Self-pacing is critically important.

Boredom with a subject again creates bad psychology and bad ultimate results.

Conclusion:

Deliver Math Education to your students utilizing SPIKE Pedagogy.

Successful Students

Chapter 4: Teacher & Coach

To learn Math, a student needs both a teacher and a coach.

The teacher selects the appropriate topics for a student, then explains each topic, and gives the student exercises and feedback via a quiz.

The coach monitors the student's activities and gives the student motivational feedback with both "carrots" and "sticks".

The "sticks" might be requiring the student to spend a certain amount of time studying math with the teacher.

The "carrots" are giving the student positive feedback in the form of compliments and rewards for efforts and accomplishments.

Mistakes are unavoidable when learning math, just like any sport or skill.

The coach should acknowledge the student's mistakes as good efforts and progress in learning the math concepts and skills.

DO NOT ever let a student feel s/he is a "failure" because of some mistake s/he makes.

Celebrate mistakes as a sign of effort and progress.

Successful Students

A coach should be able to come up with various “rewards” for a student’s progress and efforts.

Recognition and sincere compliments are often the best rewards.

A coach must be present in a student’s life, and care about the student, and make persistent and consistent efforts to give the student these positive feedbacks.

And, a “kick” when needed.

A coach must be prepared to encourage the student to make efforts even when these efforts seem to not be producing good results.

All successful people go through periods of “doldrums”.

Any successful person in the development of any skill will make many “mistakes”.

That's life! We all live it.

The coach must be sure the student understands this and appreciates this.

Compare math to some game or sport or music or any other skill the student likes.

We all make mistakes.

The more we practice, the more mistakes we make, and the better we become.

The better we become, the fewer mistakes we make, but we will always make mistakes.

The more we learn, the more mistakes we will have made.

Teacher & Coach

The coach should try to help the student see where learning the concepts and skills of math will help the student in other areas of interest to the student.

If a student is interested in any technical field s/he must realize the value of math in this field.

The coach should be sure the student is aware of this.

A coach does not have to be the teacher.

The coach does not have to know much math.

The coach will work with the teacher.

It is possible that one person can be both the coach and the teacher, but, this is usually impossible.

I can be the teacher thanks to modern technologies

You can be the coach.

Any parent must find a local person to be the coach, whether that person be the parent or another person, since this requires a continual presence and a personal relationship.

Sometimes the student can be his or her own coach.

Successful Students

Chapter 5: How to Be a Great Coach

Motivation and Learning Techniques

Motivation:

Intrinsic vs. Extrinsic

Intrinsic Motivation . . . is when a student studies and learns math simply for the internal satisfaction and enjoyment.

It is what usually motivates a person to play a game or sport.

Once a student starts to learn math and gain confidence and self-esteem, intrinsic motivation often sets in.

This is what we want as a coach and teacher.

However, for many students this takes some time.

In the meantime, a Coach can use extrinsic motivators.

Extrinsic Motivation . . . is when a student wants something that the study of math will provide. That “something” is an extrinsic motivator.

For example, if a student wants to study any STEM subject then that is an extrinsic motivator since Math is necessary for practically any STEM subject.

Successful Students

If a student wants to enter any technical field in industry or the military, then practical math is necessary, and that is an extrinsic motivator.

Triad Math's Tiers 1 and 2 provide this necessary math, and also are a great foundation for future math studies.

If a student wants to excel on the SAT, then Triad Math's Tier 3 program will satisfy this need.

Of course, other extrinsic motivators can include any type of rewards.

These can include grades, praise, privileges, money, or many other things the student might want, including the avoidance of some type of punishment.

However, we find that when the proper content and SPIKE Pedagogy are utilized by the teacher, then usually the student becomes intrinsically motivated since most of us enjoy anything that is challenging and we succeed at.

Okay, let's assume that your student is motivated enough to study math.

It is imperative that the math be taught in such a way that the student is successful. Only that will lead to intrinsic motivation.

Learning Techniques.

To successfully learn math, a coach should teach the student to engage in certain practices.

This is different than teaching the math itself.

That is why a coach and teacher are two different necessary components of a good math learning experience.

How to Be a Great Coach

I recommend Dr. Barbara Oakley's great book, *"A Mind for Numbers – How to excel at math and science, even if you Flunked Algebra"* for an elaboration on what I am going to recommend to you as a coach and to any student.

First, be sure the student studies topics in a proper sequence so that the student always has the necessary prerequisite knowledge for the topic at hand.

In other words, Proper Content. Chapter 2.

Go back and fill in any deficiencies you can identify.

First, follow the Six Tiers if you utilize me as your teacher.

Do not skip any lessons, and review a lot to be sure you don't forget what you have learned.

Second, be sure the student studies a new topic with a focused approach by studying the Notes with the Tutorial Video and then working on the exercises.

Concentrate with no distractions.

Do this for a reasonable length of time until either the student understands the topic and how to do the exercises, OR until the student gets confused and tired.

15 to 30 minutes usually good for one session.

Then STOP. Take a break!

Third, have the student engage in various activities so his or her mind can go into an Unfocused Mode.

This is when and where the sub-conscious mind processes the focused activities.

Successful Students

We don't understand how this really works, but it often does.

Usually, this involves some routine task or habit that requires little thought.

Do some routine boring chores.

Watching entertaining videos or playing games may not work.

You want the mind relaxed.

Who knows?

Try various things and see what works for the student.

Fourth, have the student then engage in another focused session and work on the same topic.

Now, usually the topic seems more understandable and the confusion lifts some.

It's pretty amazing how often this works.

Persistence will yield success.

No one to my knowledge knows how this really works, but it does often work.

Your subconscious mind is a great mystery and miracle.

Many great thinkers have confessed this is how they often solve a problem or discover a new concept.

It certainly works for me and I use it all the time.

Try it. Give it a chance to work.

How to Be a Great Coach

It is important for a coach to explain and convince a student that s/he will succeed if s/he practices and tries hard enough and perseveres.

I can remember many times when as a student I struggled with a new concept, and then after several focused and unfocused sessions, it finally fell into place.

That's how I wrote my thesis for my Ph.D. in Math.

Sometimes, after I mastered a topic I wondered why I ever had a problem with it in the first place.

Often, you have to try many things and go down many blind alleys before you achieve the understanding and solve the problem.

The more you believe in your capabilities the more success you will have.

Yes, you will have failures and frustrations.

The more difficult the problem or concept, the more you will experience this.

But, the greater the reward and satisfaction will be when you achieve the breakthrough and achieve success.

A good coach will explain these things and encourage the student.

Celebrate mistakes as progress, too.

Success does breed confidence and more success.

But, failure should also be a sign of progress in ultimately achieving success.

Success is built on the back of many failures.

Successful Students

A student must “learn to learn” and a coach can greatly facilitate this.

The coach and teacher must work in tandem.

Eventually, the student should become the student's own coach.

AND, the student should be able to apply the same techniques to learning other subjects, too!

Learning math will also teach a student how to “Learn to Learn” for any subject.

And, this is the key to success in life!

Chapter 6: Success to Failure to Success

Sometimes, a story can help a parent or student to understand the dual concepts of success and failure.

It is not uncommon for a student to experience both success and then failure.

Unfortunately, that is often where the story ends.

Fortunately, it doesn't have to today thanks to what you are learning in this book.

However, it does take some kind of serious intervention.

Here is Dr. Del's story, and how very fortunate he was, for which he gives God thanks every day.

Delbert Craig Hane, aka Dr. Del, aka Craig Hane, Ph.D. (Math) was born in Greencastle, Indiana, on November 30, 1938.

His family moved into a small bungalow on the banks of Deer Creek, five miles south of Greencastle, in the woods.

No running water, no central heat, no phone, no TV, but they did have electric lights, a radio, a manual water well pump, and an outhouse.

Successful Students

The only neighbors were Craig's Uncle Jack and Aunt Inez, a short path away in a log cabin his Uncle Jack had built five years earlier.

Lots of pets and wild life of all kinds.

Life was wonderful for Craig!

Play in the creek and take long walks in the woods, and read books and listen to the radio.

Craig's parents both worked.

Dad, in a war factory in Indianapolis, and Mom, in a beauty shop in Greencastle.

Craig spent a lot of time with his Aunt Inez and Uncle Jack.

Uncle Jack was a barber and builder.

He had built his log cabin in about 1933 during the Great Depression.

Uncle Jack knew a lot of practical math needed for life and building.

He taught Craig how to count with the decimal number system using Cheerios and dimes and pennies when Craig was 4 and 5 years old.

Homeschooling!

Craig was enrolled in the first grade at age 5 in a four room school with eight grades in Putnamville, about 3 miles away, a short school bus ride.

He was the youngest student in the first grade and the least mature.

Success to Failure to Success

His poor teacher Miss Bernice Lewis worried since he couldn't skip, sing, or color right since he was color blind.

Dumbest kid in first grade!

Then one day she started teaching the first graders to count.

None of them had been taught to count yet.

Most couldn't get past 10.

But, thanks to Uncle Jack's homeschooling, Craig could count to 100 and beyond.

Wow!

Miss Lewis was surprised and impressed.

So, Miss Lewis had Craig help her teach his older, more mature classmates how to count, and begin to add too!

This might have been the most important psychological thing to happen to Craig in his whole life.

Confidence and self-esteem!

Respect from his peers for the first time.

Craig also then learned the second grade math, too, since they were in the same room.

So by age six, Craig was well ahead of his classmates in math.

Thanks to more math from his Uncle Jack, Craig stayed at top of his class all through the 8th Grade.

Successful Students

Not only good with numbers, but practical geometry a builder knows too! (See the Uncle Jack videos for parents.)

Craig's family were all working folks. His dad had an 8th grade education.

No one in his entire extended family had ever gone to college.

College was considered the passport to great success, and Craig was always told by his family that HE would someday go to college and have success more than any of them had achieved.

Ooops!

A horrible set back occurred in Craig's freshman year, 9th Grade, in Greencastle High School.

Algebra 1! With a teacher, Mr. H.H.

Algebra was beyond anyone in Craig's family including Uncle Jack.

Even Craig's 8th Grade teacher wondered what "x" meant.

No help now from Homeschooling.

Craig struggled and didn't like Mr. H.H. since he couldn't understand him and get his questions answered.

And, Craig always made a lot of careless errors when taking a timed test.

The result?

A Bad Grade in Freshman Algebra.

Success to Failure to Success

Craig's GHS Counselor and Principal BOTH told Craig he should take “shop” since he was not “college material” like the upper class kids and would obviously be a “working man” like his dad and family.

Wow! No college.

Craig was pretty depressed all summer before the 10th grade.

Then, in the 10th grade, Craig had an amazing teacher, Miss Madonna O'Hair for Geometry.

She taught him to prove theorems logically, sort of like his Uncle Jack approached practical math.

Craig loved it and excelled and got an A.

On top again.

Then, Craig had Mr. H.H. in the 11th Grade for Algebra 2.

Now things were different.

Craig became a very disliked student since he now asked questions and demanded logical answers that Mr. H.H. wouldn't give him.

To be fair, Mr. H.H. probably didn't know the answers.

Bad student.

Bad grade again.

Craig went to Miss O'Hair for advice.

What do you suppose she advised him?

Successful Students

DePauw University is in Greencastle and only the brightest GHS graduates could go there.

Miss O'Hair suggested to Craig that he go to DePauw his senior year as a Special Student and take Algebra there and see how it went.

Mr. McCammon, the GHS Principal, strongly objected, "Craig, you'll embarrass GHS. You will not do well in Algebra since you didn't do well in Algebra twice here."

Craig's dad, Delbert, had a talk with Mr. McCammon and Craig was given permission to embarrass GHS.

So, 16 year old Craig enrolled in College Algebra at DePauw as a Special Student.

Mistake!

This was for DePauw sophomores.

He should have been enrolled in Freshman Intermediate Algebra.

So, Craig was in a class with 19 and 20 year old DePauw students who were going on in Math.

The Professor was Dr. Clint Gass, who was the DePauw Math Department Chairman.

Long story short, Dr. Gass was a great teacher like Miss O'Hair, and Craig got an A.

Dr. Gass became Craig's mentor, too.

In the second semester, Craig took Trigonometry at DePauw with Mr. Johnson and got an A there, too. Good teacher again.

Success to Failure to Success

In Craig's junior year at GHS he tutored the captain of the football team, Fred U., in Geometry, and was paid to do so by Mrs. U. Amazing!

Getting paid for something he loved to do. Amazing!

Then Mr. H.H. was teaching Trig to the junior and seniors at GHS, and Mr. H.H. got the flu.

Miss O'Hair was asked to teach the class for a week.

She said she would only do so IF Craig could teach it.

After all, he was learning Trig at DePauw and was a couple of weeks ahead of GHS.

So, Craig got his first experience teaching a whole class.

The topics were Trig Identities and all the GHS students learned them in the following week.

When he returned Mr. H.H. told the class Identities were not important and there would be no test!

Mr. H.H. was probably a typical H.S. math teacher, incompetent.

Miss O'Hair was an exception.

Craig was extremely fortunate to first be homeschooled by Uncle Jack, than a wonderful, good teacher Miss O'Hair, and then a wonderful college professor, Dr. Gass.

Craig had a mediocre GPA in high school.

He worked about 20 hours per week from 7th grade on, and saved all his money. No time for wasting it anyway.

Successful Students

By the end of his senior year, Craig had enough money for four years tuition at a private school like DePauw.

But, Craig wanted to escape Greencastle and go to a College like DePauw, but with no Greek fraternities and sororities.

Oberlin College was a few hours away on the Pennsylvania Railroad, and Craig visited and loved it. So, he applied.

Craig was accepted to Oberlin College, the No.1 Liberal Arts College in the USA in 1956 thanks to the huge endowment by Charles R. Hall who founded Alcoa.

Craig believes this was due to Dr. Gass's recommendation.

Craig now had self-confidence in math and did well at Oberlin.

He also taught math to his classmates as a paid Problem Session Instructor. He used what is now called SPIKE Pedagogy.

Then, upon graduation in 1960, he taught all four classes of math for one year on a temporary license at Western Reserve High School in Wakeman, Ohio, 20 miles west of Oberlin.

That was the most wonderful year as a teacher in Craig's life.

And, he fully came to believe that Math Education in most of the USA was truly horrible.

Most of his successful fellow math majors at Oberlin had been to private schools or wonderful public schools in New York or some other large city.

Graduates of ordinary high schools had little chance for success in math.

Success to Failure to Success

Craig believed he had just been incredibly lucky to have Miss O'Hair and then Dr. Gass as teachers.

Home for the summer and visiting Dr. Gass as usual, Dr. Gass invited Craig to teach math at DePauw the second semester in 1962, while he, Dr. Gass, went on sabbatical.

Dr. Gass also suggested that Craig enroll in graduate school math at Indiana University to see what it was like.

Craig did both, and then received his Ph.D. in Theoretical Math from I.U. in 1966.

Just imagine.

“You are not college material due to your freshman Algebra 'failure'” in 1952 at GHS to teaching math at DePauw in 1962.

Then, getting a Ph.D. in Math at Indiana University in 1966, and on to Associate Professor of Math at Indiana State University teaching the most advanced math subjects for three years.

Then, Associate Professor of Math at Rose Hulman Institute of Technology teaching the most advanced math subjects like Topology and Functional Analysis, for four more years.

Then, Craig decided to have several business adventures, one of which was to found an industrial training company in 1980, which taught thousands of skilled tradesman technical subjects for 25 years.

Visit: www.HaneTraining.com to see them.

Craig always wanted to see Math Education reformed, but had no practical way to help do this until 21st Century Technologies appeared.

Successful Students

In 2008, Craig began to create a modern 21st Century Math Program and was amazed when in 2009 Wolfram Alpha arrived on the scene.

The rest is history.

In the next chapter, you can learn about the Six Tier Math Program Craig created that is the first 21st Century Math Program to appear.

It is vastly superior to the current Standard Math Curriculum Programs in both Proper Content and SPIKE Pedagogy.

Be sure to try one of the Special Offers to prove it to yourself and your children, like Grace Libman, and many others have.

Nothing to lose, and much to gain!

Chapter 7: Future Math Possibilities

Tiers 1 – 6 Syllabus Overview

For full details go to: www.CraigHane.com and you may download the full syllabus about half way down my home page.

Getting Started. Tier 1 and the Scientific Calculator

Tier 1 teaches the student how to use a scientific calculator, the TI-30Xa: 16 Lessons.

Then, PreAlgebra, which is a review of the Rules of Arithmetic. 10 Lessons

Tier 1 usually gets any student into a good frame of mind and convinces them Math can be easy and fun.

Getting a student's psychology set regarding Math is the first and most important thing to do. See Chapter 5.

Foundation - Practical Math. Tier 2

Tier 2 covers Practical Algebra (10 Lessons), Practical Geometry (19 Lessons), and Practical Trigonometry (7 Lessons).

Most students can cover this in about 60 hours of study time +/- 30 hours, depending on their background and their math aptitude. So, about one semester.

Now, a student is really confident of their ability, and most now really like math.

They also realize that they are now prepared to learn many different technical subjects.

Indeed, they will now know more math than 95% of adults in the USA.

They are ready for the military and apprentice programs.

They have high confidence and self-esteem.

Here's a problem they will be able to solve in less than one minute. You, the reader, can try it or give it to someone you know.

Find the area of a triangle whose sides measure 6.4ft, 8.7ft, and 12.3 ft

Answer: 26.5 sq ft

Future Math Possibilities

College-Bound SAT or ACT Prep. Tier 3

Some of these topics are good for Consumer Math.

Some of these topics are good for Quantitative Reasoning.

Some of these topics are just good for tricky questions on a test like the SAT.

Most students take about a year to master Tier 3.

Part 1 of Tier 3 should prepare you for a standard test you will need to pass to graduate from high school.

Part 2 of Tier 3 will teach you additional mathematics you will need to excel on the SAT and ACT and other exams.

Part 3 is SAT Prep, how to prepare and how to take such an exam.

Ok, this will help you get into college by scoring higher on the SAT or ACT tests.

But, will it mean you are prepared for a STEM subject in college?

No.

You will need a lot more math to be well prepared for a STEM subject and to compete with other students who have been properly educated with STEM Math.

STEM Math PreCalculus. Tier 4

Now, we will cover Algebra, Geometry and Trigonometry at a much deeper level required for STEM, plus much more!

We now introduce and use a 21st Century Math Tool unleashed on the world in 2009: Wolfram Alpha.

Wolfram Alpha revolutionizes the way you learn math and do math, i.e. solve Math Problems.

No math textbooks teach this as far as I know, as of July 2021.

No math courses in any schools teach this either, so far as I know.

In Tier 4, we also teach Complex Numbers the proper way by utilizing Euler's Equation and the Geometric Approach which unites Complex Numbers with Trigonometry.

Again, I know of no current math curriculum that does this.

AND, it is vitally important for many STEM subjects in Science and Engineering.

Calculus the right 21st Century way. Tier 5

Differential Calculus, Calculus 1, teaches a student how to analyze functions, which are the building blocks of all STEM subjects.

This is not too difficult with the old manual tools, but time consuming and error prone, and often not possible for some problems.

With Wolfram Alpha, it is now very easy and will solve any calculus problem.

Integral Calculus, Calculus 2, is very difficult when using the old manual tools.

One must find the anti-derivative of a function to apply the Fundamental Theorem of Calculus to calculate a definite integral.

Finding the anti-derivative can be very difficult and time-consuming, and often impossible with ordinary functions.

Calculus 2 probably has flunked more students out of STEM schools than anything else. Some schools use it as a “filter” to “weed out” weak students, but ironically, it often weeds out very good students, too, who have just had some poor teachers. I can tell you some horror stories.

Now, Wolfram Alpha makes Integral Calculus very easy, too. It will find the anti-derivative of any function, even if it involves a Special Function.

Now, Calculus goes from an 8 on the difficulty scale of 1 to 10 down to a 2.

And, it gets even better.

Successful Students

Now, most students can learn Calculus in Tier 5 in about one semester, not one or two years like the old manual Calculus.

And, the student will now be ready to compete with their best-trained peer students.

Future Math Possibilities

Differential Equations. Tier 6

Differential Equations are the workhorse of Science and Engineering subjects.

Historically, Differential Equations are not taught in high school because they are too difficult.

Most schools don't even teach Integral Calculus.

Solving Differential Equations whose solutions are functions is even more difficult than Integral Calculus.

All changed in the 21st Century due to what ??????

Wolfram Alpha.

In Tier 6, we teach a student how to solve Differential Equations with Wolfram Alpha.

This takes most students about one semester.

SO, today if a student starts studying our Program at say age 12, the student should get through Tier 6 by age 16 or 17.

Also, the student will probably acquire a SupraComputer and begin to learn Wolfram Language which was introduced to the world in 2016.

Now, the student is off to the STEM races.

Homeschools, private schools, and charter schools will probably lead the way.

They can now use an online program utilizing coaches to teach 21st Century Math the right way, thanks to many new technologies.

Successful Students

Amazingly, sometimes a Struggling Student goes on to study STEM subjects after getting turned around, like I did.

I recommend you read my book, *Golden Rule Math for STEM Students* where there is a more in depth discussion.

Free Resources

Simply go to www.CraigHane.com to get the current free resources available from Dr. Del.

The Video Library Tab will yield many videos Dr. Del has created, and is an ever expanding Library.

These videos are all YouTube videos.

Potential STEM students will want to watch the three videos on the Concepts of Calculus.

Some are also YouTube videos of others that Dr. Del finds inspirational and informative.

Successful Students

Special Offers

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.

Successful Students

Affiliates

Go to: <https://www.triadmathinc.com/affiliate/>

to learn about our current Affiliate Program.

The Affiliate Program is designed to empower you to help other students and families improve their lives.

Usually, this will involve giving them a valuable gift from Triad Math with your recommendation to try it.

Giving your own testimonial experience will be invaluable in getting them to use the gift.

Then, IF they purchase a product from Triad Math, Inc. you may be eligible for a commission or some other valuable product.

Dr. Del's Mission should be one you share, which is to help student's get an Optimal Math Education in the best way possible.

Successful Students

Who is Dr. Del?

Who is Dr. Del?

Dr. Del is a pen name used by Delbert Craig Hane, Ph.D.

You may get a full biography at:

<https://craighane.com/vita-of-craig-hane-ph-d/>

or just go to www.craighane.com and press the Vita Tab.

In a nutshell, Dr. Del has been a Learner of Math and a Teacher of Math for over 75 years.

75 years?

Yes. Craig was taught the decimal number system and how to count and add by his Uncle Jack (Davis) who was a barber and builder, using Cheerios in about 1942 -3 when Craig was five years old.

This was the beginning of WWII for the USA and most parents were heavily involved and had little time to teach their children at home.

When Craig was five years old he was enrolled in the first grade at Putnamville, Indiana, a four room school with eight grades.

He was the youngest student in the first grade with teacher Miss Bernice Lewis.

Craig also was the only student in this first grade who had been taught to count in the decimal number system and so

Successful Students

Miss Lewis had him help her teach his classmates to count.

Thus, Craig had his first teaching experience at age five.

No doubt this was a life transforming experience.

You are urged to have your children teach other children things they have learned as soon as possible to other children.

Of course, Craig went on to learn math from other teachers and teach other students math the rest of his life right up to the first writing of this book, July, 2021.

Learning and teaching math are just two sides of the same coin.

Then, applying math to all sorts of situations in the real world can lead to all sorts of wonderful successes.