

# Mathworks

## 2024 Annual Report



(math, work)

***On Point***

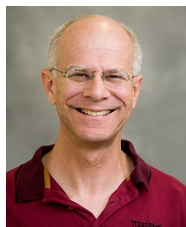
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# From the Director

Dear Friends,

We have much great news on Mathworks' efforts in 2024. Some of the highlights include:



1. We welcomed four new members to the Mathworks Steering Committee: Alex Lochoff, Head of Partnerships for National Math Stars; Pat Forgione, Past Superintendent of Austin Independent School District; Kaye Forgione, Teacher Professional Development leader who has worked on curriculum at the state and national level; and Ed Burger, President of St David's Foundation and past President of Southwestern University. They join Jeff Kodosky, Bob Rutishauser, Mike Starbird, and Howard Falkenberg in providing strong leadership and guidance for Mathworks as we plan our future efforts.
2. A special thanks to Sarah and Ernest Butler for their tremendous contributions to Mathworks. They established the Sarah and Ernest Butler Endowed Scholarships which provide support for students to attend our math camps every summer. Sarah and Ernest stepped down from the Steering Committee this year and we will miss their thoughtful suggestions and guidance.
3. Thanks also to our wonderful Mathworks Steering Committee, particularly Jeff and Gail Kodosky, whose gifts provided the foundation for the Mathworks Endowment. We are delighted to announce that we have reached our initial goal of raising \$6 million to sustain Mathworks programs for years to come.
4. We are now embarking on a new campaign to double our Mathworks Endowment in the next 5 years by raising an additional \$6 million. This will enable us to broaden our outreach to communities that have not historically had access to our programs, while sustaining the undergraduate and graduate Mathworks Fellows Programs at Texas State. Undergraduate Mathworks Fellows get an early teaching experience assisting in the Junior Summer Math Camp (JSMC). Graduate Mathworks Fellows teach in the JSMC, pilot and test new curricular resources for teachers and students, and work on related research projects. Together, they are part of a unique learning community that is developing the next generation of student leaders in STEM.

The future is bright indeed. I hope you will enjoy reading about what Mathworks has been doing. We welcome your help and support in this effort as we begin to plan for our work with teachers and students in 2025. If you would like to visit one of our programs this summer, please get in touch. We would be excited to have you join us.

With all best regards,

A handwritten signature in black ink that reads "Max".

Max Warshauer, Director  
Mathworks  
max@txstate.edu

## MATHWORKS

### 2024 Annual Report, On Point

#### MISSION

Mathworks at Texas State University is a center for innovation in mathematics education. Our mission is to research and develop model programs and self-sustaining learning communities that engages K-12 students from all backgrounds in doing mathematics at a high level.

#### LEADERSHIP COUNCIL

Max Warshauer - Director  
Eugene Curtin - Associate Director  
William Boney - Assistant Director, Research Projects  
Tim Chase - Assistant Director, Outreach  
Cody Patterson - Assistant Director, Teacher Education  
Hiroko Warshauer - Assistant Director, Research  
Susan Morey - Math Department Chair  
Jian Shen - Faculty

#### ADMINISTRATIVE SUPPORT

Patty Amende  
Judith Claypool  
Shannon Hicks

#### MATHWORKS STEERING COMMITTEE

Ed Burger  
Howard Falkenberg  
Kaye and Pat Forgione  
Jeff Kodosky  
Alex Lochoff  
Bob Rutishauser  
Mike Starbird

#### TEXAS STATE UNIVERSITY

Kelly Dampousse, President  
Pranesh Aswath, Provost  
Barrett Bryant, Dean, College of Science & Engineering  
Susan Morey, Chair, Department of Mathematics

#### BOARD OF REGENTS

#### TEXAS STATE UNIVERSITY SYSTEM

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Stephen Lee  
Tom Long  
William Scott



***"My favorite things I learned from math camp were summations, Routh's Theorem, and mass points. These things were particularly interesting as they're new concepts to me and once I learned about them, many problems suddenly seemed to have another solution."***

***2024 JSMCR Student***

# Mission Alignment

## MISSION STATEMENT

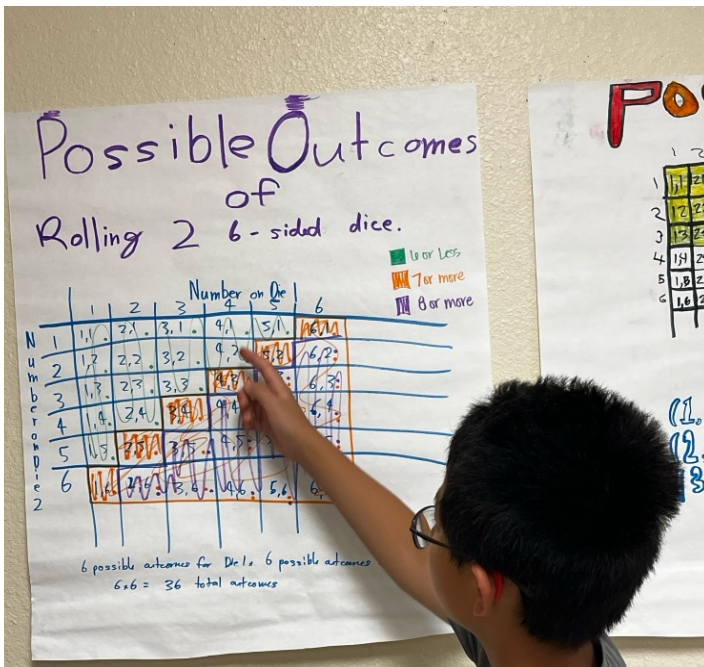
**"Mathworks at Texas State University is a center for innovation in mathematics education. Our mission is to reach and develop model programs and self-sustaining learning communities that engage students from all backgrounds in doing mathematics at a high level."**

Texas State University (TXST) goals and initiatives for 2023 - 2029 promote **effective outreach** at the core, "Enriching Community, Collaboration, and Partnerships .... Build community relations, collaborations, and partnerships with external stakeholders ... increase engagement in activities and program that promote a welcoming community and a sense of belonging..."

## ALIGNMENT POINTS

Our mission aligns to the goal to create effective outreach since:

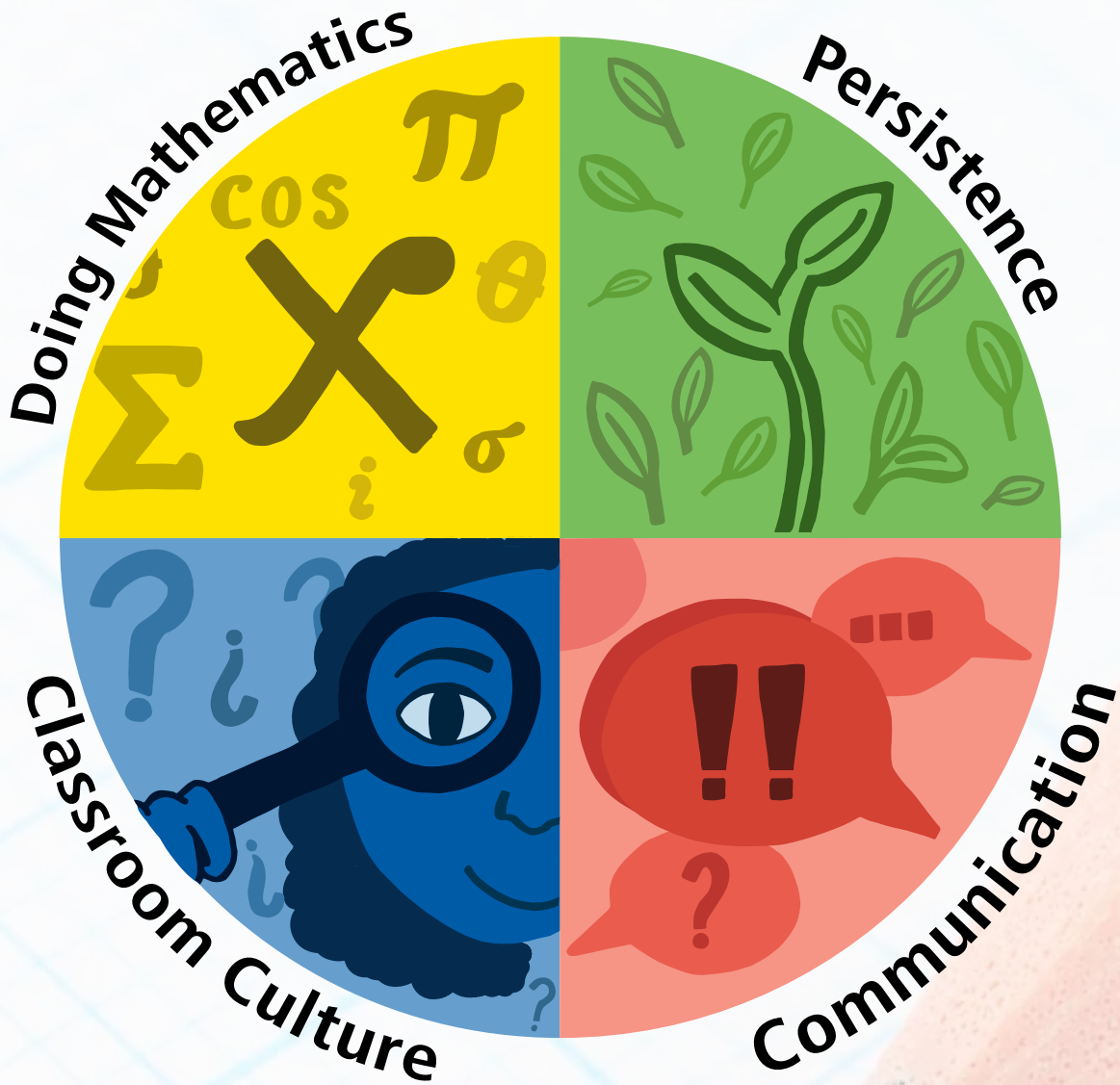
- Our programs provide opportunities for our undergraduate and graduate students to research and develop new math content and pedagogy.
- Math summer camps prepare all students to do higher-level math and science.
- We develop innovative and creative problem solvers who will be future leaders in STEM.



## Three Pillars with a Research Point of Focus

Mathworks offers three core programs supported and informed by research. Beginning with summer math camps for elementary to high school students, we develop problem-solvers who are unafraid of new challenges. Students learn to think deeply and work collaboratively with others. This concept extends into middle school curriculum that challenges students with fun, engaging problems, and professional development for in-service and pre-service teachers that prepares teachers to make these problems come alive in the classroom. The element that ties everything together is research about new and innovative ways of teaching, and research opportunities for undergraduate and graduate students interested in mathematics education.

# Guiding Principles



## Guiding Principles Are Woven Into Every Program

The Mathworks Guiding Principles are intentionally woven into every aspect of the Mathworks Programs. Research has shown that students' learning success depends on an integrated approach that supports students in each point: Doing Mathematics, Persistence, Classroom Culture, Communication.

### **Doing Mathematics**

Doing mathematics is about making sense of and thinking deeply about fundamental concepts.

Students should:

- “Think deeply of simple things,” (Arnold Ross)
- Build on prior knowledge by making connections that follow the flow of ideas from what they previously understood to new ideas being studied
- Promote a deep understanding for why things work
- Focus on the math problems, not the answers
- Reflect on what they have learned to make sense of the mathematics

### **Persistence**

Persistence is critical to success in problem-solving and doing mathematics.

Students need to:

- Develop a “growth mindset;” and understand that ability can be developed with hard work
- Be willing to take risks and realize that mistakes present opportunities for learning
- Take ownership of their own learning
- Develop confidence to tackle new situations without giving up easily

### **Classroom Culture**

Teachers need to establish a classroom culture that develops students’ curiosity and imagination. The keys to establishing this culture are to:

- Make math interesting, fun and relevant with challenging, well-sequenced problems
- Support students’ productive struggle by responding to student questions with appropriate guidance
- Allow sufficient time for learning ideas deeply
- Use techniques to engage all students
- Balance individual and group work; both can be appropriate depending on the task

### **Communication**

Communication between students and teachers are critical for learning.

To facilitate better communication, teachers should:

- Ask probing questions to develop student understanding, and encourage students to question why things work
- Expect students to present their work and defend their reasoning using precise mathematical language
- Take student attempts seriously, and examine both right and wrong approaches
- Expect students to articulate and explain the key math concepts

# Camps and Contests



*"I think that I have changed a lot in how I relate to others because the community at this camp really made me feel at home and accepted."*

-2024 Student

## Mathworks

### A Center For

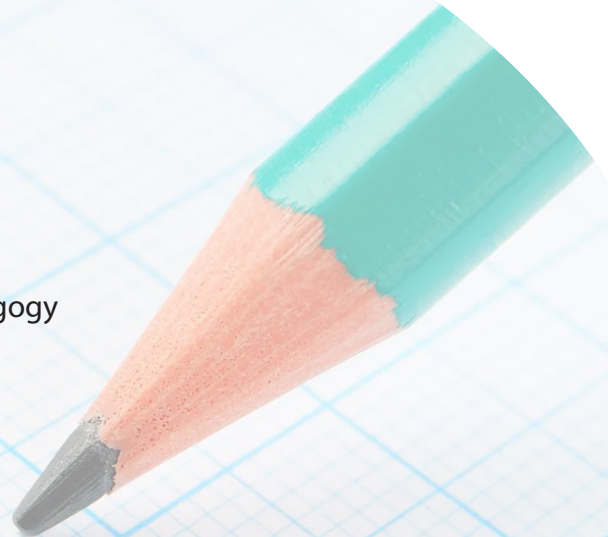
- Mathematics Learning
- Teacher Professional Development
- Research about math teaching and pedagogy
- Personal Growth and Development
- Community Impact

### Fostered by Relationships

- University
- Community
- Alumni

### Reinforces Connections

- Relationships with diverse groups
- Benefits all participants

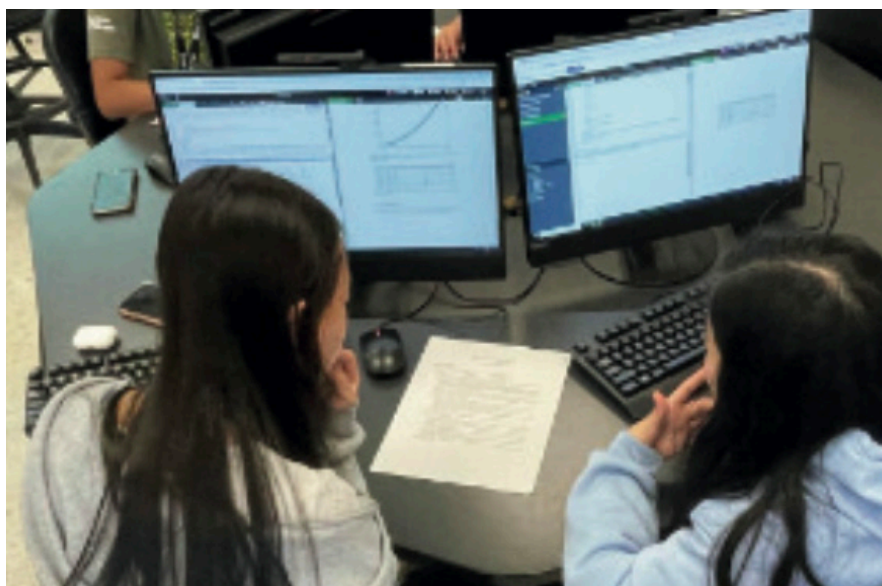






*"I feel like being a counselor has revitalized my love for mathematics and has inspired me to continue to explore it."*

-2024 HSMC Counselor



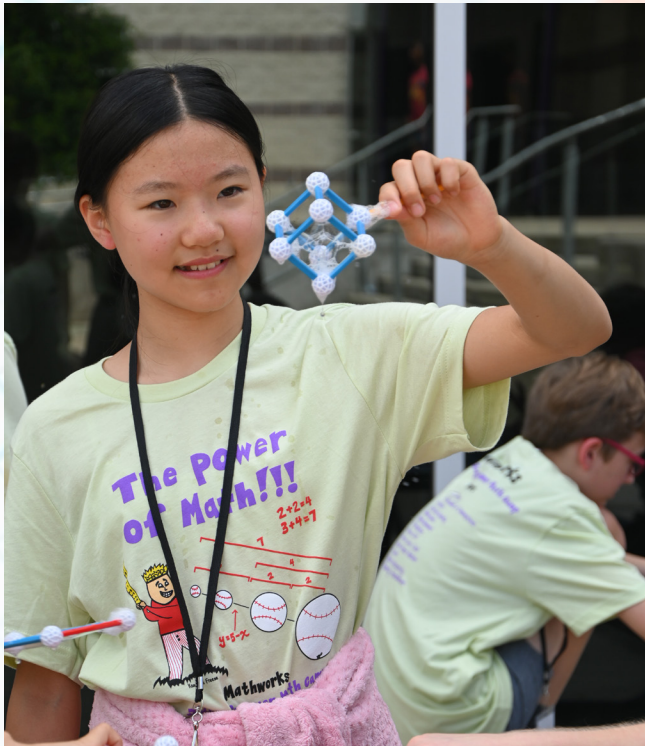
## Camps

Doing mathematics is about making sense of and thinking deeply about fundamental concepts. Students should:

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- Build on prior knowledge by making connections that follow the flow of ideas from what they previously understood to new ideas being studied
- Promote a deep understanding for why things work
- Focus on the math problems, not the answers
- Reflect on what they have learned to make sense of the mathematics

# Junior Summer Math Camp - Half-Day

Junior Summer Math Camp Half-Day (JSMCH) provides a unique mathematical learning community for elementary and middle school students, pre-service teachers, in-service teachers, undergraduate students, graduate students, and university faculty. Young students have role models who provide a vision for why studying math is important and how students can use what they learn to pursue careers in Science, Technology, Engineering, and Mathematics (STEM).



**Two-Weeks, Half-Day Camp**  
**Classes: 12**  
**Levels: 5**  
**Grades: 3 – 8**  
**Curriculum: *Math Quest***

*"My favorite math activity was learning about the Pythagorean theorem and playing Skunk!"*

- JSMCH 6<sup>th</sup> Grade Student





*"I really liked coming here to camp and I enjoyed playing games and having fun while learning."*

- JSMCH 7<sup>th</sup> Grade Student



## Who is involved?

### Students

Students Applied: 225  
 Students Attended: 169  
 Female: 83, Male: 86  
 Scholarships Awarded: \$43,900

### Master Teachers (MT)

MT Invited: 11  
 MT Attended: 11  
 Female: 9, Male: 2

### TXST Graduate Research (GR) Students

GR Applied: 12  
 GR Attended: 5  
 Female: 3, Male: 2

### Professional Development (PD) Teachers

Fellows Applied: 54  
 Fellows Attended: 24  
 Female: 18, Male: 5

### TXST Undergraduate Fellows

Fellows Applied: 54  
 Fellows Attended: 24  
 Female: 18, Male: 5

# JSMCH Continued

## TXST Undergraduate Fellows

TXST students from a variety of academic backgrounds assist students in the JSMCH. Many Fellows go on to graduate and PhD programs.



*"It helped me try and find **new ways of mathematical thinking**, become **better at explaining math concepts**, and become **more inquisitive to kids thinking**, rather than telling them they're wrong and providing the answer, or only congratulating them when they get the right answer."*

-2024 Mathworks Fellow

*"What I enjoyed most about math camp was having a bond with some Fellows and my students in just two weeks! Not only that, but also being able to **get more experience in a math classroom setting** and finding new techniques to use in my future classroom!"*

-2024 Mathworks Fellow

## TXST Graduate Research

TXST graduate students teach and conduct research during camp. A recent publication of research conducted during JSMCH was showcased at the International Congress on Mathematical Education (ICME 15) in Sydney Australia in July. Topic: Task Design



*"I have read a lot about math education and found it put into practice in the camp classroom, which gave me a better feel about **what research-led instruction can look like**. I learned that small doses of scaffolding can help students continue to explore the problems. Saying something like, 'I noticed this pattern, what could I do with that?'"*

-2024 TXST Graduate Student

## Master Teachers

Master teachers return year after year (some for as long as 24 years) to teach during camp as a way to stay focused on student learning and rekindle their love of teaching. Our master teachers are in-service teachers from all around Texas: San Marcos, Midland, San Antonio, Austin, and McAllen.



*"Observations help me do better. When we discuss what is happening in the classroom and students' learning, I get solid information of what is going well and what is not."*

-2024 Master Teacher – Level 1

## Professional Development

Four districts across Texas were represented during the JSMCH. After learning Mathworks Guiding Principles, and methods, McAllen teachers conducted an in-district camp with 17 students attending their Level 1 Camp.



*"Allowing students to think deeply about simple things! This is something that stood out to me a lot. It is definitely something I will preach to my team this upcoming school year."*

-2024 PD Teacher, McAllen

*"I have become more aware about how students enjoy and fall in love with math. I have learned new strategies and new methods of questioning. Students felt safe to make mistakes and ask questions. Students had the opportunity to be creative and become problem solvers. I also realized the importance of having kinesthetic activities as well as games."*

-2024 PD Teacher, San Marcos

# Junior Summer Math Camp - Residential

The Junior Summer Math Camp Residential (JSMCR) is an immersive summer program for middle school students who are excited about doing mathematics. The goal of the program is to develop talented young students into creative and critical thinkers. We nurture students' interests and abilities to pursue higher-level math courses and degrees and careers in math, science, engineering, and many other fields.



Students from diverse backgrounds live, learn, and work together to become persistent problem-solvers. Their personal growth and mastery of algebraic concepts reaches beyond the two-weeks. Nearly half the HSMC students previously attended the JSMCR.

*"I created strong social connections with amazing people who, like me, have a strong affinity for math. Finally, **this camp taught me the importance of collaboration and teamwork.** My study group and I correctly completed those difficult problems because of the strong bond we developed throughout these two weeks. We discovered each other's strengths and weaknesses; and were able to come together as one to solve math problems."*

-2024 JSMCR Student

## **Two-Weeks, Residential Camp**

**Grades: 6 – 8**

**Groups: 18**

**Courses: Problem-Solving**

**Students Applied: 211**

**Students Attended: 71**

**Female: 36, Male: 35**

**Scholarships Awarded: \$23,000**

**Counselors: 18**

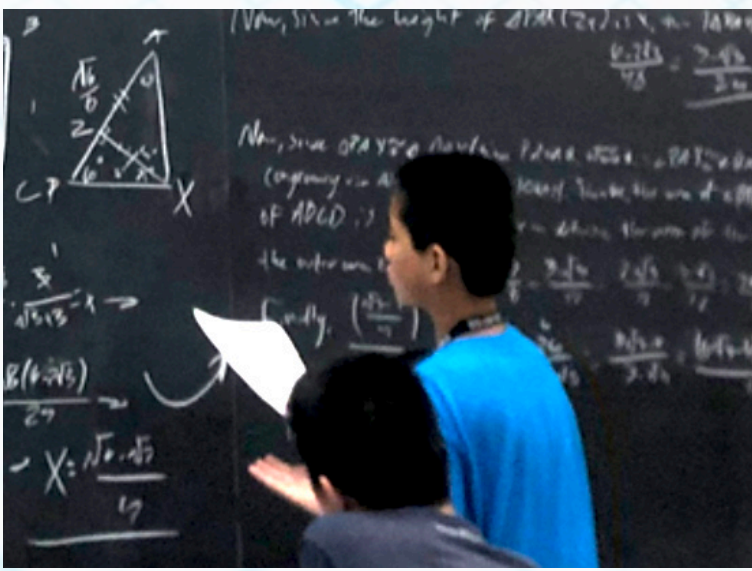
**Faculty: 4**

**U.S. States Represented: 11**



"This math camp **challenged me to solve problems that I thought I wouldn't have been able to solve** until high school or even college but also taught me about friendships and being independent since we were away from home."  
 -2024 JSMCR Student

"This math camp is different because here it's encouraged to understand the concept and **not just memorize formulas and get right answers.**"  
 -2024 JSMCR Student



# Honors Summer Math Camp

The Mathworks Honors Summer Math Camp (HSMC) is an intensive multi-summer program for high school students. The goal of the program is to develop talented students of all socioeconomic backgrounds through immersive and in-depth experiences in a unique learning environment. Students develop important skills for future degrees and careers in math, science, engineering, and many other fields.



## Six-Weeks, Residential Camp

**Groups: 20**

**Grades: 9 - 12**

**Courses:**

- **Number Theory**
- **Honors Seminar**
- **Python**
- **Analysis**
- **Combinatorics**
- **Abstract Algebra**
- **Topology**

**Students Applied: 523**

**Students Attended: 76**

**Female: 40, Male: 36**

**1<sup>st</sup> Year: 36**

**2<sup>nd</sup> Year: 27**

**3<sup>rd</sup> Year: 13**

**Scholarships Awarded: \$77,000**

**Counselors: 21**

**Faculty: 7**

**Research Mentors: 9**

**Research Projects: 10**

**U.S. States Represented: 18**

*"I think that I have  
**changed a lot in how I relate to  
others** because the community at this camp  
really made me feel at home and accepted."  
-2024 HSMC Student*



*Mathematically, this camp has propelled me to **think for myself** and really try to understand my answer instead of memorizing it. I wish everyone could experience math as I've experienced it here..."*

*-2024 HSMC Student*



TXST faculty mentor with HSMC high school students on original research projects. Over 100 projects have been recognized as regional semifinalists and above in national competitions, including one team that won the grand prize of \$100,000 at the Siemens Competition in Math, Science, and Technology in 2009.

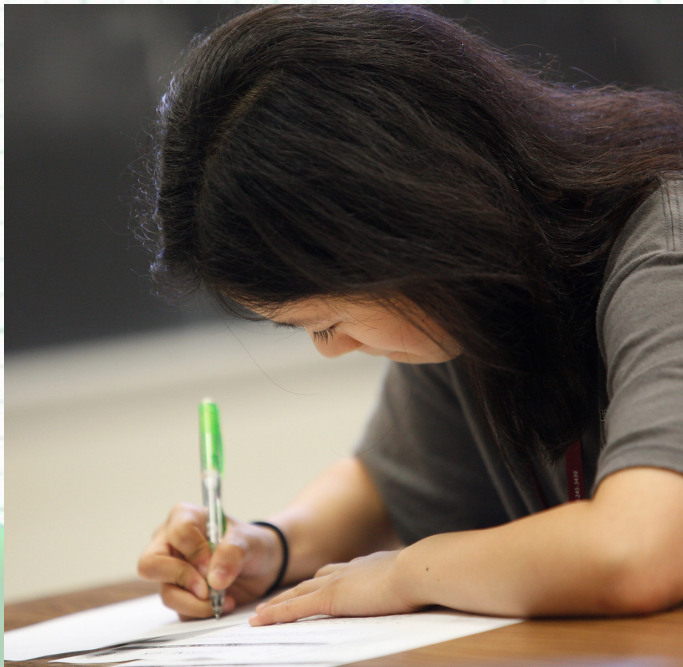
*"School does not go out of its way to create **opportunities for students to work together** like problem session and study group does. Many people in math camp share same interests or have similar experiences as me, so I find it easy to make friends."*

*-2024 HSMC Student*

# Mathworks Math Contest

The Mathworks Math Contest (MMC) is an opportunity for middle school students in grades 6 - 8 to explore mathematics and be challenged by high-level problems. The test is offered free of charge.

The MMC is a 15-question test that is proctored by math teachers, coaches, and parents at their respective schools generally at the end of October. Teachers download the test, administer it to students, and send students' responses to us. After all the tests have been graded, scores are released. Top scoring students are recognized. All participants are invited to apply to the Mathworks residential Junior Summer Math Camp (JSMCR).



## Mathworks Math Contest (MMC)

Free annual contest

15 Questions

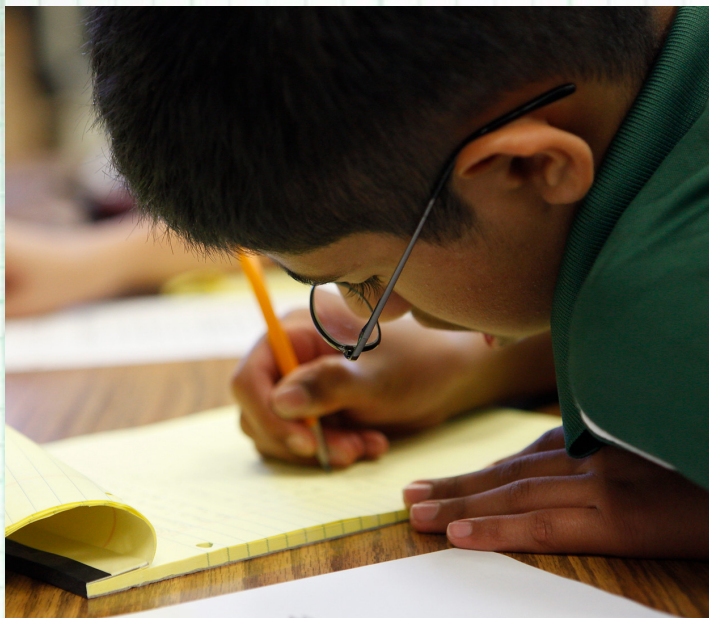
2-Hour time limit (no calculators)

## 2023 MMC

Mean Score: 2.33

Number of Participants: 1,294

Top Scoring Middle School Students are recognized for their outstanding accomplishment and invited to apply to the Junior Summer Math Camp - Residential (JSMCR) program.



The Primary Math World Contest (PMWC), hosted by Po Leung Kuk, is an annual worldwide mathematics contest for middle school students that takes place in Hong Kong, China. Every year, Mathworks administers the Mathworks Math Contest in order to select the members of the PMWC team. Members of the team earn automatic acceptance to the Residential Junior Summer Math Camp, and an all-expense paid trip to Hong Kong to compete in the Primary Math World Contest.

The Mathworks team has won first place in the world 3 times in the Primary Math World Contest. Fantastic work!

# Primary Math World Contest

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The Mathworks team has won first place in the world 3 times in the Primary Math World Contest. Fantastic work!

## Planning for 2025

Mathworks is set to return to the PMWC in 2025. The contest was canceled from 2020 - 2022 due to Covid. In 2023, Mathworks participated in the PMWC virtual contest with Team members Rhea Ghosal, Nathan Liu, Judy Song and Vincent Wang. In 2024, Mathworks did not send a team.

Four students (two female and two male) will be selected from the students who took the Mathworks Math Contest. These top scoring students (eligible by PMWC age requirements) will be required to attend the two-week Junior Summer Math Camp Residential program in June of 2025. They will be mentored by Dr. Jian Shen (Professor at TXST) to work together as a team for the upcoming contest in Hong Kong.

In July, the Mathworks team will be joined by Dr. Jian Shen, Team Leader and a Deputy Team Leader as they travel to Hong Kong to compete against other middle school students from around the world. During the contest, the team will take both individual and team contests. Check out the sample problems from the PMWC 2019 tests:

### Sample Individual Contest Question

The positive integers starting from 1, are written consecutively as "123456789101112....". What is the 2019<sup>th</sup> digit?

### Sample Team Contest Questions

The last two digits of the numbers  $2019^m$  and  $2019^n$  are the same. If  $m$  and  $n$  are positive integers where  $m > n$ , then what is the smallest possible value of  $m - n$ ?



2019 Team (left to right): Keri Jaworski, Deputy Team Leader, Eric Peng, Christopher Qiu, Anne Christiano, Tina Li, Hiroko Warshauer, Team Leader

Awards: Po Leung Kuk Cup for the top non-Asian team; Co-Champion of the Red Division with a perfect team score; and 2nd runner up in the Individual Competition

# Curriculum



## Middle School Curriculum

### Math Explorations (ME) Curriculum

- 6<sup>th</sup>, 7<sup>th</sup>, 8<sup>th</sup> Grade Math Curriculum
- Integrates learning from more than 25 years of summer math programs
- TEA Approved
- Aligns with the Texas Essential Knowledge and Skills (TEKS) for grades 6, 7, and 8
- Engages students in using pre-algebraic and algebraic ideas
- Research-based, classroom-tested, and developed by nationally renowned mathematics educators
- Prepares students for the STAAR math exams and the Texas Algebra 1 EOC

*"The activities [from Math Explorations] we do are great, especially because I get to learn more than I have in the past."*  
-San Marcos CISD Student

## How it started and our philosophy.

Every child can learn algebra at a young age. The Guiding Principles are woven through each topic in the *Math Explorations* series: Doing Mathematics, Persistence, Classroom Culture, and Communication.

*"I think that a big part of the Mathworks philosophy is **getting the kids to be problem-solvers instead of answer-finders**. The problems are very rich. They're not just, 'OK, here's a problem, we're going to work this out, got my answer and move on.' They have to think about it, they have to read carefully and apply knowledge of variables and the content."*

-San Marcos CISD Teacher

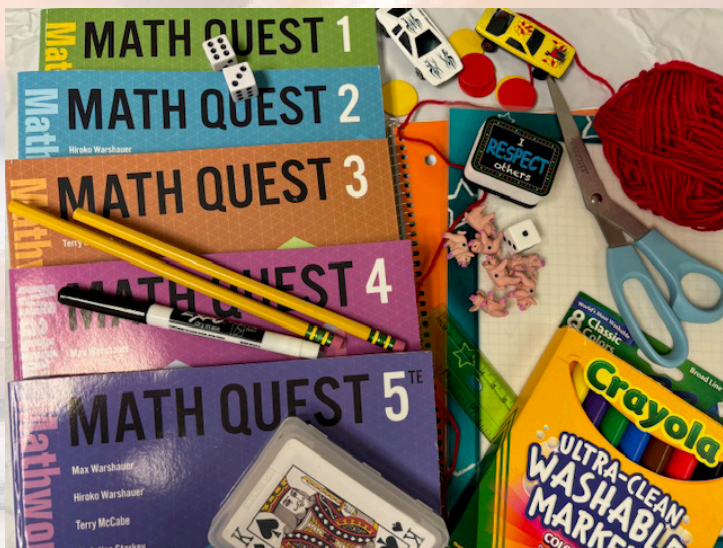
# Math Camp Curriculum

## Math Quest Curriculum

- Used during JSMCH camp
- Five Levels
- Aligns to 3<sup>rd</sup> – 8<sup>th</sup> grade math
- Includes student and teacher editions

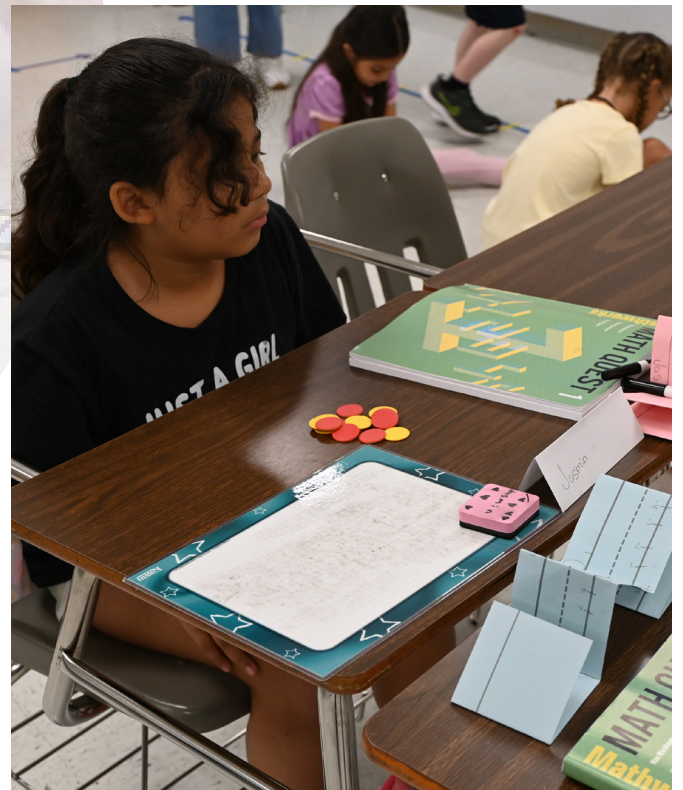


From a first-year program that introduces students to beginning concepts in algebra through play-acting and drama (dramathics), to a more advanced program in problem solving and discrete math, students enjoy exploring problems together and share in the excitement of mathematical exploration and discovery.

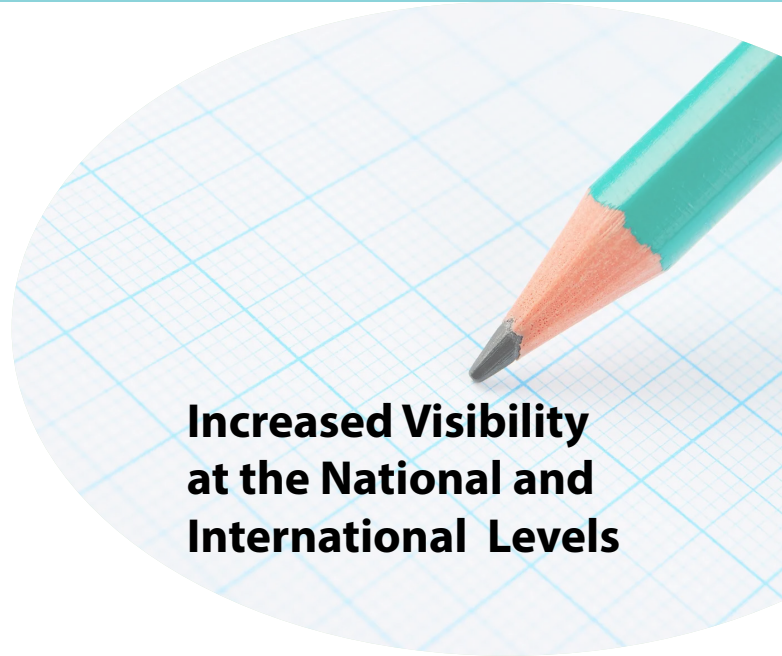


## Camp in a Box

- Books and supplies for each Level
- *Math Quest Curriculum*
- For use in mini-math camps and after-school enrichment programs



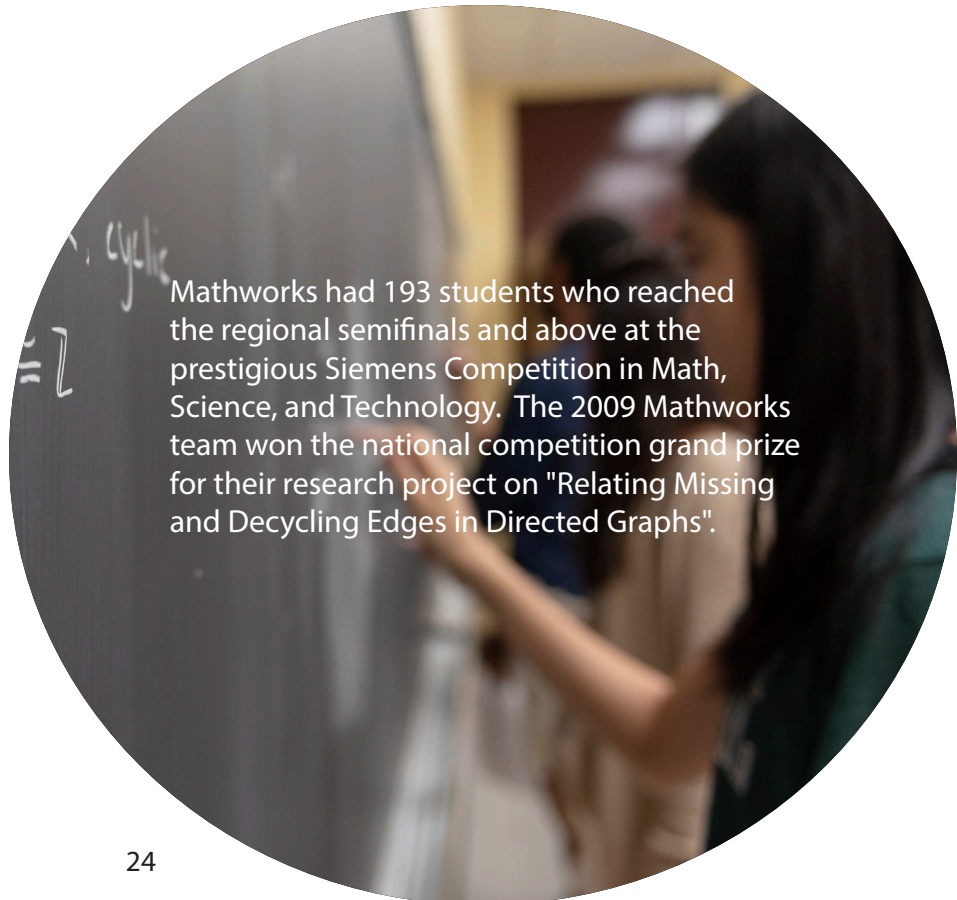
# Research



## A Global Meeting Point for Mathematics Educators

Mathworks boosted its international prominence as Hiroko and Max Warshauer attended the International Congress on Mathematical Education (ICME-15) in Sydney, Australia in July to present research conducted with graduate students Lino Guajardo and Holly Zolt during the 2021-2022 Junior Summer Math Camp program.

**Topic: Task Design to pique student interests: Using non-mathematical topics to engage students in mathematics.**



Mathworks had 193 students who reached the regional semifinals and above at the prestigious Siemens Competition in Math, Science, and Technology. The 2009 Mathworks team won the national competition grand prize for their research project on "Relating Missing and Decycling Edges in Directed Graphs".





## **TXST Faculty Mentored Research Projects - Summer 2024**

Returning Honors Summer Math Camp (HSMC) students - after attending the first-year program at HSMC have the opportunity to work on original research projects mentored by TXST faculty. Projects from 2024 include:

### **Physically-Based Audio Effects**

Amanda Li, Rolando Martinez, Carolyn Wang, Jessie Wang; Mentor: Victor Cepeda

### **Topology of the Turaev Genus of Knots**

Shreev Goyal, Joshua Kou, Emma Wu, Helen Yang, Aaron Zhou; Mentor: Christine Lee

### **Examining the Influence of Fairness Metrics on Clustering Algorithms**

Brandon Cardamone, Katherine Liu, Theo Sittig, Meiting Yang; Mentor: Ivan Ojeda-Ruiz

### **5-cycles in the Complements of Minimal Prime Graphs**

Micah Dorton, Ronok Ghosal, Ryan Tang, Justin Yu; Mentor: Thomas Keller

### **Creating a More Flexible Test for the Population Mean**

Grace Huh, Albert Kim, Andy Zhou; Mentor: Steven Hoberman

### **Demazure Products of Type D Permutations**

Darren Han, Michelle Huang, Benjamin Keller, Jerry Zhang; Mentor: Suho Oh

### **Mitigating Bias Beyond Gender in Natural Language Processing**

Aien Du, Alicia Gu, Thalia Kahozi, Elizabeth Lei, Chloe Weng; Mentor: Ivan Ojeda-Ruiz

### **Developing Fast Training Logistic Regression Models**

Nicolas Aldana, Anant Asthana, Gordon Chen, Tomas Faletti-Moore, Cameron Hong, Chloe Polin, Emma Qiu, Ram Sivaraman; Mentor: Young-Ju Lee

### **Comparing Performances of Neural Networks on Genetic Data**

Olivia Bley, Jason Cheng, Ethan Poon, Adriana Vigo, Angela Wang, Kalia Wang, Elena Xiao, Joseph Zhang; Mentor: Xiaoxi Shen

### **Derived Length of Solvable Groups**

Reiyah Jacobs, Cody Zhou; Mentor: Burcu Cinarci

# Mathworks Ecosystem

Mathworks began in 1990 as a small 4-week camp with 12 high school students and 4 graduate students. Over the years, it has grown into a comprehensive center for math education that provides a unique learning community impacting students and teachers throughout Texas and nationally. Mathworks pillars include summer math camps, associated teacher professional development, and research and development of new curriculum and teaching materials. Underlying each of these pillars is research about the best ways to teach and learn mathematics.

## Center for

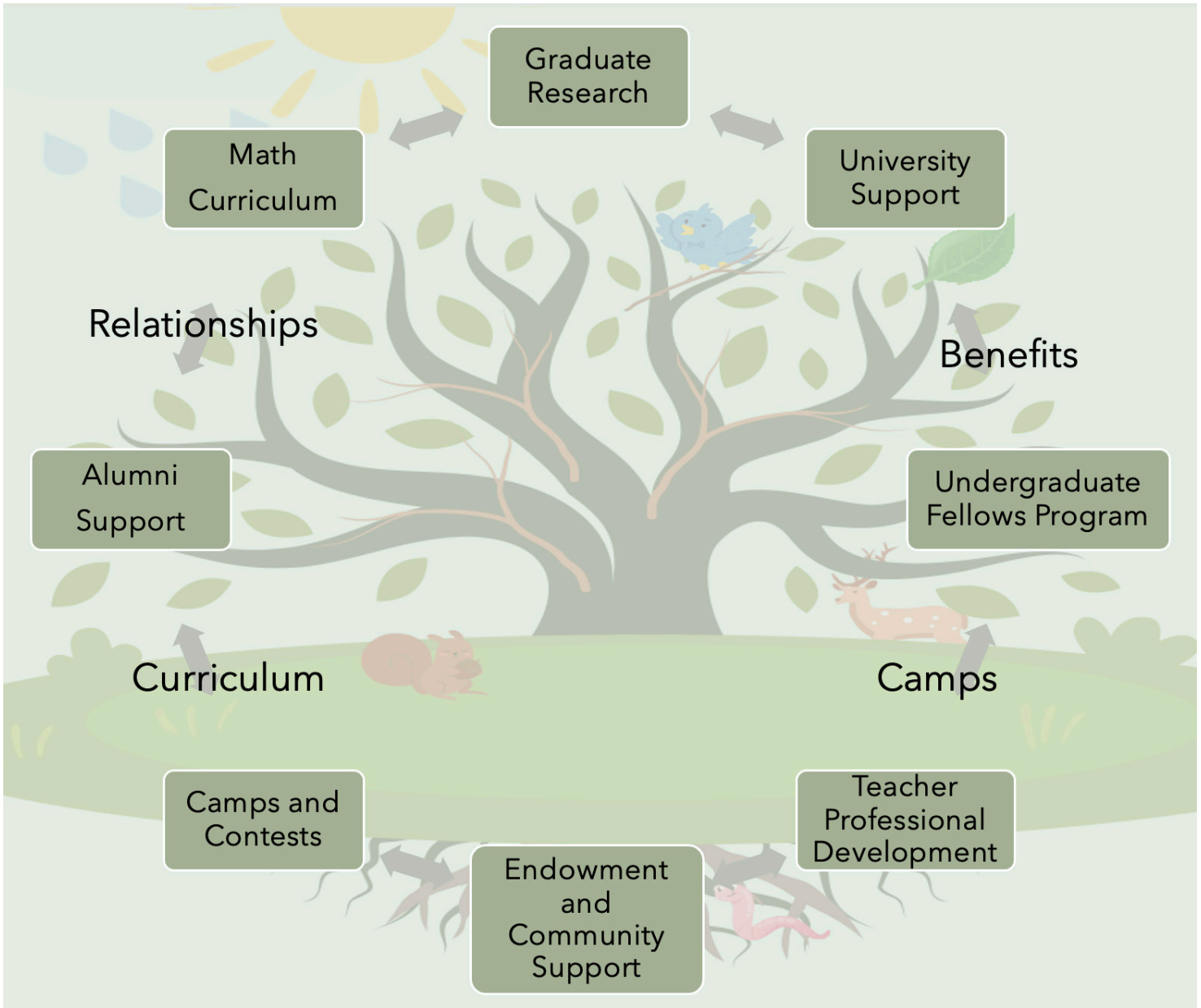
- Mathematics learning
- Teacher professional learning
- Research about math teaching and pedagogy
- Personal growth and development
- Community impact

## Fostered by Relationships

- University
- Community
- Alumni

## Reinforces Connections

- Relationships with diverse groups
- Benefits all participants



# Relationships



Tim Chase (left) and Cody Patterson (right) relaxing after a hike at the Bamberger Ranch during the 2024 HSMC.

## Dr. William Boney

I grew up in Austin, Texas and spent several lovely summers at Texas State University as part of the Mathworks program. I moved out of state to attend Grinnell College in Iowa. I got my Ph.D. at Carnegie Mellon University in Pittsburgh, PA in 2014. Prior to coming (back) to Texas State University, I had positions in Chicago and Boston.



My work is mostly in model theory, which is an area of logic. Rather than having anything to do with modeling, model theory is a kind of meta-mathematics that studies the way other people do mathematics and turns classes of structures (vector spaces, graphs, groups, etc.) into the objects of study. This allows model theory to both identify common causes of similar phenomena across mathematics and to transport techniques from one area to another.

I specifically work with non-elementary classes, those that require axioms beyond first-order logic to describe. Moving beyond first-order logic means that we lose the powerful compactness theorem, and much of my research is in finding what fragments of compactness can be recovered in different classes. This research naturally intersects with set theory, category theory, and different areas of algebra.

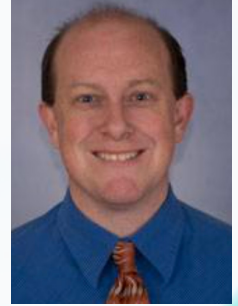
Cody Patterson and Will Boney both attended the HSMC program when they were in high school. Spending time at the HSMC program shaped their futures as they pursued careers in mathematics at TXST.

## Dr. Tim Chase

Dr. Tim Chase is an Associate Professor of Instruction of Mathematics at Texas State University. He has been teaching during the JSMCH, JSMCR, and HSMC programs since 2018.

### Scholarly/Creative Works

- Chase, T. M., & Gruenhagen, G. (n.d.). Monotone covering properties and properties they imply. *Topology and Its Applications*, 213(1), 135–144. 2016
- Chase, T. M., & Gruenhagen, G. (n.d.). Compact, monotonically metacompact spaces are metrizable. *Topology and Its Applications*, 160(1), 45–49. 2013



### Awards

- Math Department Teaching Award, Texas State Math Department, 2023.
- Champion of Black Student Success, Coalition of Black Faculty and Staff, 2023.
- John R. Hood Honors Professor of the Year, Honors College, 2022.
- Teaching Excellence Award, Texas State Department of Mathematics, 2017.

## Dr. Cody Patterson

Received his B.S. and M.S. in Mathematics at Texas A&M University in 2002 and 2003, respectively, and completed his Ph.D. in Mathematics at the University of Texas at Austin in 2010. In his dissertation, he constructed examples of  $CAT(0)$  cell complexes on which certain classes of Coxeter groups act without global fixed points.



From 2011 to 2015, Dr. Patterson served as the Director of the University of Arizona's Center for Recruitment and Retention of Mathematics Teachers, which provided induction coaching and professional development for over 400 K-12 teachers of mathematics in the Tucson metropolitan area. He has also remained active in the mathematics competition community, serving as the chair (2017-2018) of the Question Writing Committee for MATHCOUNTS, the largest contest in the United States for middle school students, and serving as an Associate Editor for the American Invitational Mathematics Examination.

Dr. Patterson's research investigates secondary students' and teachers' mathematical meanings for concepts and procedures in high school algebra, such as solving equations and graphing quantitative relationships. He is the recipient of a National Science Foundation DRK-12 award (#1908825) for the project "Reasoning Language for Teaching Secondary Algebra (ReLaTe-SA)".

"I enjoy mathematics because of the endless opportunities it provides for exploration of abstract structure, as well as the power it offers for explanation of natural phenomena. There are few things I enjoy more than getting wrapped up in a problem, especially when the problem is simple enough to explain to a classroom full of children and can be explored using mathematical techniques ranging from the elementary to the exotic."

I enjoy math because I love working with friends and colleagues to solve interesting problems.

# Benefits

## Connections

Mathworks offers opportunities for TXST students to be a part of the Mathworks environment by participating as a Mathworks Fellows, Counselors, Grad Student and more.

From International events to regional meetings, Mathworks represents Texas State University System (TSUS) as one of the premier math camp programs in the nation.

Led by the members of the Mathworks Steering Committee, Mathworks is positioned to make deeper connections with the community while increasing excitement around mathematics research and mathematics education.

## Increased Awareness and Recruiting

For the past two years, Mathworks has partnered with Latino Education Advancement Fund (LEAF) to encourage and support students from the Baltimore, Maryland area to attend the Honors Summer Math Camp.

*"Something that I didn't know about myself prior to this camp was that **I am capable in learning more things that I have not seen before. I also learned how to better interact with others.**"*

-2024 First-Year Student HSMC

"I feel that the biggest change I have gone through in this camp is my willingness to approach and talk to new people. Being at this camp has helped me realize that it is **fun to get to know and interact with people of different backgrounds.**"

-2024 HSMC Student

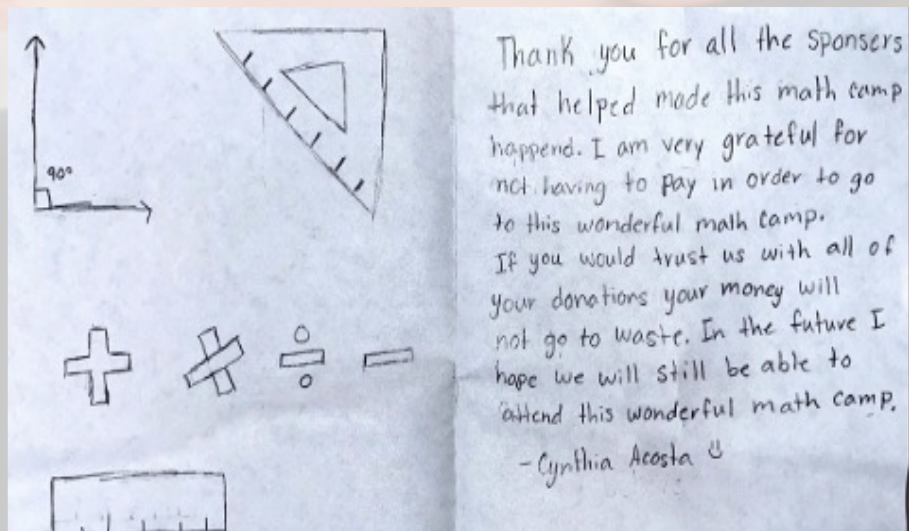
## Replicating the Mathworks Model

McAllen ISD Remote Camps

Francisco Garcia and Maryssa Perez attended the 2024 Professional Development (PD) program that runs in conjunction with the JSMC Half-Day program. Inspired and equipped for the task, they conducted a camp in their home district of McAllen, TX. Mathworks donated Camp in a Box supplies. Prior to leaving the PD program, they loaded up the supplies and headed home with everything they needed to conduct their own camp.

### Students:

17 Middle School Students



# Financial Report



*"The **scholarship** was a tremendous help for our daughter to participate in the camp. I can't imagine if my daughter couldn't attend the camp without this assistance; she would never have discovered her love for math and the joy of studying with other mathletes. Now, she has grand dreams to achieve more, to become a better person, and to change the world by helping others. After a few days of rest, she is now fully immersed in math. Thank you so much!"*

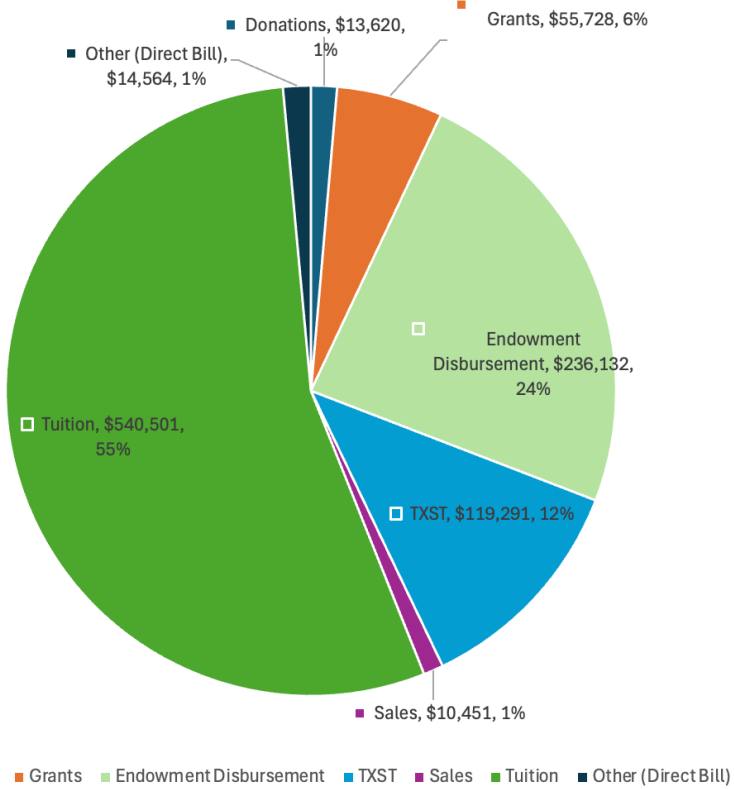
-2024 JSMCR, Parent



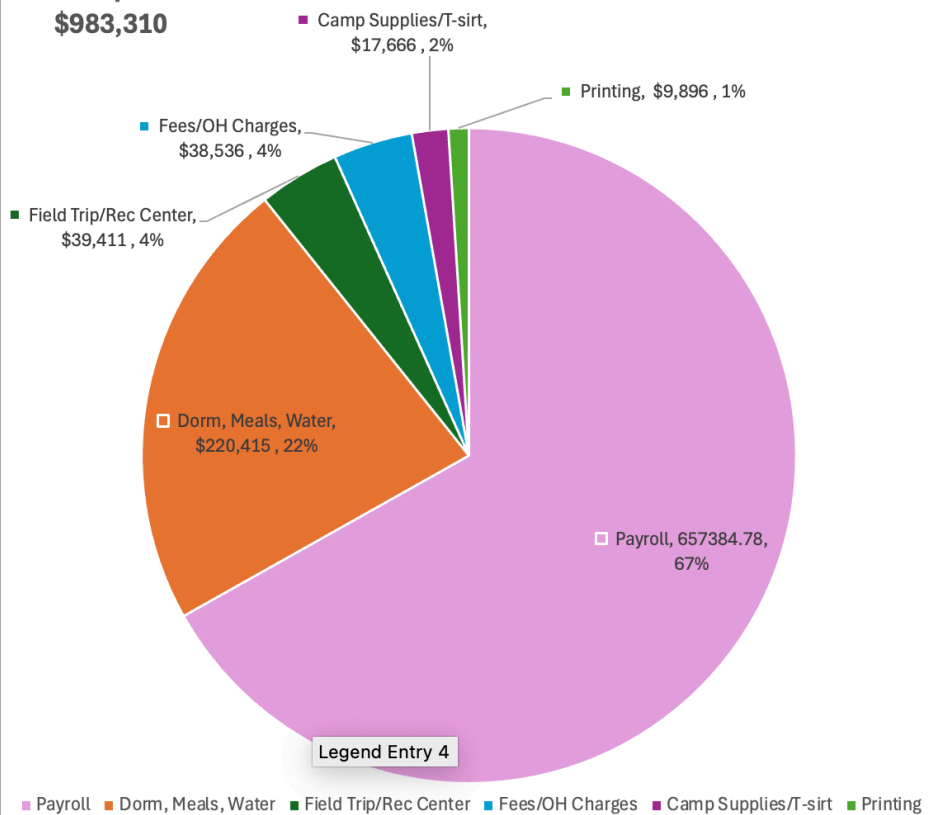




### 2024 Income \$990,287



### 2024 Expenses \$983,310



***"All truths are easy to understand once they are discovered; the point is to discover them."***

**-Galileo Galilei**



Do you share our  
point of view?  
Donate now.



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## Corporations and Foundations

AMD Employee Giving

Apple Employee Giving

Apple Matching

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## Endowment Partners

Sarah & Ernest Butler

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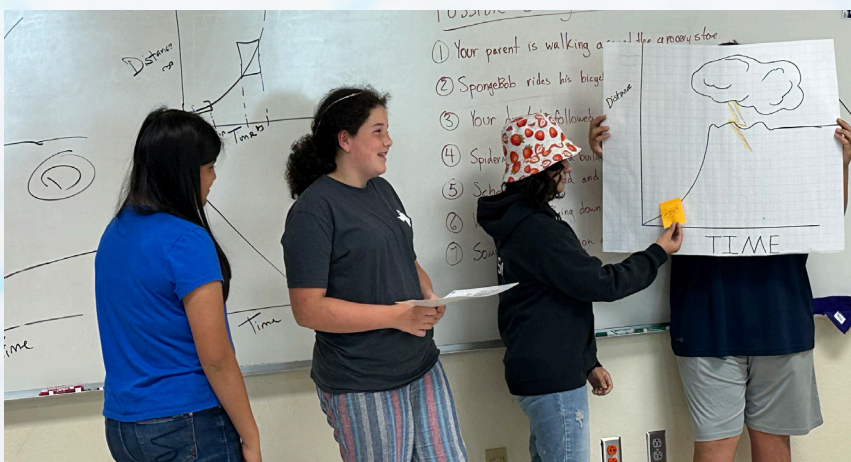
Jeff and Gail Kodosky

Mathworks Development

Ronya Kozmetsky and RGK Foundation

Sam Baethge

Thank you for  
your commitment  
to Mathworks and to  
mathematics education.



TEXAS  
STATE

(math, work)

# Mathworks

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