TEXAS STATE UNIVERSITY
SAN MARCOS
The rising STAR of Texas

Mathworks at Texas State University | 2012 Annual Report

Building Foundations

BUILDING FOUNDATIONS FOR **BRIGHT FUTURES.**

TOGETHER WE:

CREATED AN INNOVATIVE MATH CURRICULUM PROGRAM THAT HAS SIGNIFICANT POTENTIAL TO RAISE THE LEVEL OF ACHIEVEMENT FOR YOUNG STUDENTS OF ALL SOCIOECONOMIC BACKGROUNDS

LAID THE FOUNDATIONS OF AN EARLY ALGEBRA PROGRAM FOR AN ENTIRE MIDDLE SCHOOL OF MORE THAN 750 STUDENTS, CREATING PATHWAYS TO COLLEGE DEGREES AND FUTURE CAREERS

DEVELOPED THE CREATIVE PROBLEM-SOLVING ABILITIES OF MORE THAN 320 YOUNG STUDENTS WHO PARTICIPATED IN THE 2011 MATHWORKS MATH CONTEST

ENGAGED MORE THAN 280 YOUNG STUDENTS IN DOING IN-DEPTH MATHEMATICS THROUGH OUR 2012 SUMMER MATH PROGRAMS

MENTORED 14 MATHWORKS STUDENTS THAT WERE RECOGNIZED IN THE PRESTIGIOUS SIEMENS COMPETITION, INCLUDING A TEAM OF 3 THAT ADVANCED TO THE NATIONAL LEVEL

FROM THE DIRECTOR

Dear Friends of Mathworks:

We have just completed one of our most successful years ever! The enclosed Annual Report highlights some of what we have achieved together. Our three pillars—Summer Math Programs, Teacher Training, and Curriculum Development are becoming nationally recognized models. This year there are a number of things to look forward to:

- I am part of an organizing committee through the American Math Society that will disseminate best practices of establishing summer math programs to organizations across the country
- Math teachers we trained this past summer are now using our *Math Explorations* curriculum at Miller Middle School in San Marcos, creating one of the top math programs in the country right here at home!
- Our school-year curriculum is undergoing final revisions in preparation for submission for state adoption

Our Mathworks Algebra Program is a partnership between San Marcos CISD, the Sid W. Richardson Foundation, and the KDK-Harman Foundation. And the Meadows Foundation has just awarded us a grant to evaluate and identify the critical elements of success for replicating this program statewide. Most importantly, all of our programs are changing the lives and expectations for what students can do in mathematics.

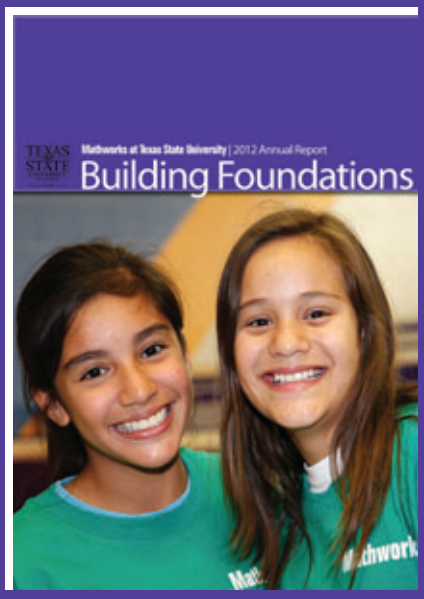
One of our biggest challenges now is to establish an endowment for future generations through the Mathworks Legacy Campaign. This effort was begun by Gail and Jeff Kodosky who made a wonderful initial match challenge of $1.5 million. We also received a $350,000 match challenge from the KLE Foundation to engage the local community. Our immediate goal is to rise to the challenge created through this extraordinary support. The exciting part is that each $100 donated by alumni will result in an increase of $800 to our endowment because of the pledges above, with all other local gifts of $100 quadrupled by the match challenges.

In closing, I invite you to learn more about our work's impact and to join our mission of engaging all students in doing mathematics at a high level. We realize that every child is a leader in the making, and with your help, we can give all students the mathematical foundation they will need to tackle new problems and realize their dreams. Thank you so much for your help, and I hope to see you soon.

Sincerely,

Max

Max Warshauer
Director, Mathworks at Texas State University
Regents Professor of Mathematics



STAFF

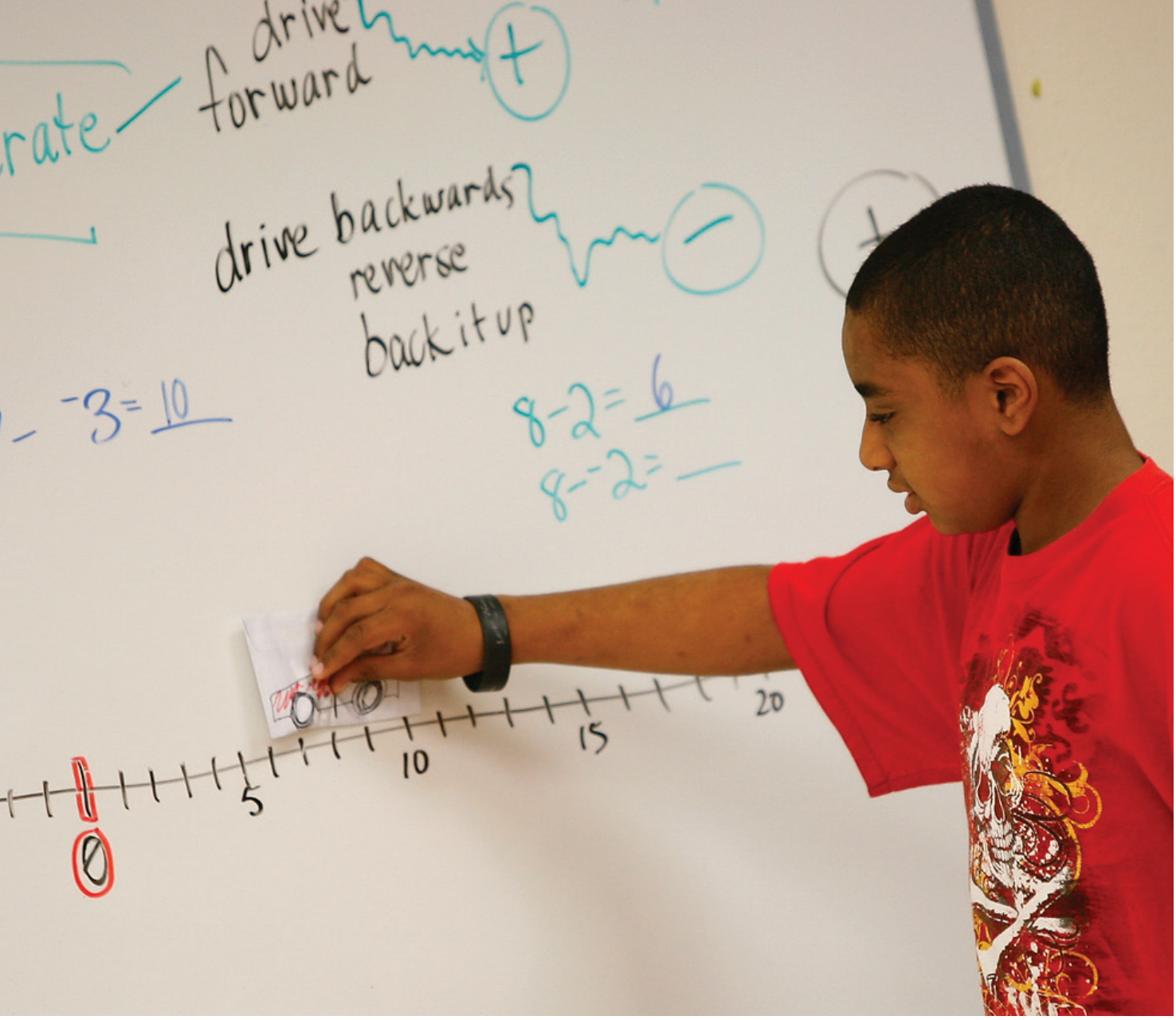
Max Warshauer, Director
Terry McCabe, Associate Director
Andrew Hsiau, Program Specialist
Patricia Amende, Accountant

ADVISORY BOARD

Herb Carter
Howard Falkenberg
Jeff Kodosky
Bob Rutishauser
Jim Smith

MISSION

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



MATHWORKS CURRICULUM

Establishing solid foundations in algebra, ultimately providing pathways to higher-level mathematics, increasing college enrollment, and improving degree completion rates.

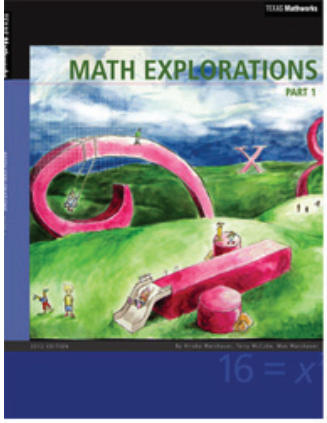
Having an early preparation in algebra provides the foundation on which bright futures can be built. The pathways to degrees and careers in math, science, engineering, and many other fields that drive the innovations of this nation all begin with a possessing a problem-solving mindset that can be developed in young students. Through the Mathworks curriculum, *Math Explorations*, students gain experience with algebraic and pre-algebraic concepts. The curriculum includes:

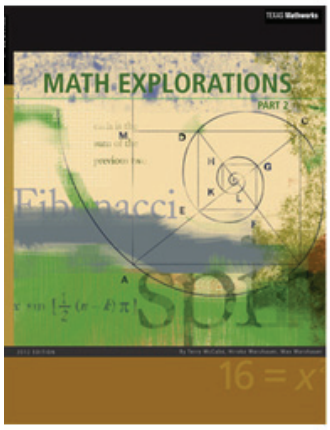
- Student textbooks, student workbooks, and teacher's editions
- A full alignment to the state of Texas' math standards, the TEKS
- Use of variables throughout the 6th-8th grades
- Mathematical models that strengthen understanding of fundamental concepts
- Problems to engage and challenge students of all mathematical levels

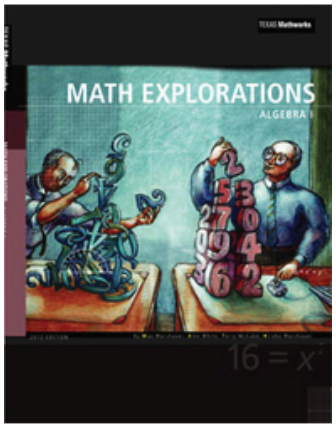
Completion of upper level math courses correlates strongly with college enrollment rates
*The **college enrollment rate** for first-generation students who had taken any higher-level math courses **is almost double the rate** compared to those who had not: a striking 64% to 34%*

Algebra completion and success correlates strongly with degree completion
*Students who do not complete Algebra II in high school **are three times more likely to require developmental math courses** while in college. And only 20% of those taking developmental courses obtain degrees within six years, resulting in significant burdens on a student's tuition costs.*

*Use of the Mathworks curriculum **correlates strongly with significant increases in algebra readiness, as well as success in algebra.** Students in pilot studies have achieved gains one or two grade levels above their nationally-normed peers.*







*"The exercises, the examples, and the development of concepts in **Math Explorations** addresses mathematics in a deep and thoughtful way. It's an example of a curriculum that's not a mile-wide and an inch-deep. The textbooks conform with, and align with, many of the best ideas, and more recent research about mathematics curriculum."*

- Gerald Kulm, Curtis D. Robert Professor of Mathematics Education at Texas A&M University

Mathworks Algebra Program (MAP)

With the vital support of community partners, we laid the groundwork for a comprehensive early algebra program at Miller Middle School here in San Marcos. The entire school—more than 750 students—is using the Mathworks curriculum, setting young students on tracks to success in high school, college, and beyond.

MAP at Miller is a partnership between Mathworks, San Marcos CISD, the KDK-Harman Foundation, the Sid W. Richardson Foundation, and the Meadows Foundation.

The numerous layers of support integrated into MAP include:

- Teacher professional development in the summers
- Ongoing teacher training during the school year with university math faculty and the district's math coach
- Weekly planning meetings between university math faculty and Miller math teachers
- Undergraduates serving as teaching assisstants in the math classes, gaining early classroom experience while mentoring the young students
- Family Math Nights that engage parents and the community in their students' learning

A vital component of MAP at Miller Middle School is a rigorous external evaluation, identifying all the critical elements for success. In addition to achieving great results with the students of today, we are establishing the foundations for a replicable model to impact the students of tomorrow.

The program has significant potential to be a model that affects students in districts across the state, addressing long-standing achievement gaps between different demographic groups, while raising the level of achievement for all students.

JUNIOR SUMMER MATH CAMP

Motivating and developing mathematics abilities among young students

The 17th annual Junior Summer Math Camp (JSMC) served more than 180 central Texas students in the 4th-8th grades. Thanks to the generosity of numerous donors, more than 100 low-income students were able to participate in the program, building upon their mathematics knowledge and abilities.

Studies show that the middle school years are crucial in sustaining students' interest in math and science, and the JSMC provides exciting and engaging opportunities over multiple summers. Expert teachers nurture students through engaging lessons and hands-on activities that bring the lessons to life.

Further research has shown that access to quality summer academic programs correlates strongly with better achievement during the school year. The Mathworks JSMC provides students of all financial backgrounds the opportunity to develop abilities, persistence, and confidence.

"I have discovered many math formulas, and can't believe how much information I've gotten in two weeks. I've had tons of 'ohhh, I get it now!' moments. This camp was challenging, and that made it fun."

- Emily, 6th grader in the JSMC

"This camp is a very strong foundation that will help you with your education in math. To be honest, before I came here, math was not one of my favorite subjects. But now it is. Math Camp rocks!"

- Haena, 6th grader in the JSMC

RESIDENTIAL JUNIOR SUMMER MATH CAMP

Engaging and challenging opportunities for middle school students

The residential Junior Summer Math Camp hosted 40 middle school students, including four from Indonesia. This international connection emphasized the universal language of mathematics, and its potential to change mindsets. Ridwan Saputra, the Indonesian national math education clinic coach noted of his experience, "Our time in the JSMC at Texas State University not only made me and my students smarter in mathematics, but also changed my perspective of America. I found everyone to be friendly and cooperative!"

Students in the program were immersed in creative and complex problem-solving. The curriculum of the residential JSMC emphasizes connections across mathematical areas, and an inquiry-based approach that focuses on processes rather than merely writing down an answer. These young students also had the unique experience of living on a college campus for two weeks, learning more about all the resources that an university has to offer for their futures.

The challenging and rigorous problems move beyond what is typically offered in classrooms and introduces concepts in thoughtful and engaging manners. Students gained experience in learning topics covering Number Theory, Algebra, Geometry, and Probability. During nightly study groups, these middle schoolers shared their ideas with each other and with their undergraduate mentors. This open discussion and collaboration nurtured verbal communication skills, developing students' abilities to convey their ideas effectively.

"The JSMC has helped me to learn about new math concepts and also to think about problems in a new way. I was already planning to do something related to math in the future, and this program has made me even more sure of that."
- Karina, 7th grader

PRIMARY MATH WORLD CONTEST TEAM

More than 320 students participated in the 2011 Mathworks Math Contest, and from them we selected a team of four to participate in the 2012 Primary Math World Contest (PMWC) in Hong Kong. The team of Gina Chen, Vivian Liu, Stephen Price, and Daniel Whatley attended the residential Junior Summer Math Camp in early June as part of their training.

They then traveled to Hong Kong later in the summer with team leader Hiroko Warshauer and team chaperone Ashley Beach. This year, Silicon Labs of Austin provided critical sponsorship for the team, elevating opportunities for gifted and talented students. The four students achieved a perfect score on the team portion of the Contest, adding to the achievements of teams fielded by Mathworks in this international competition.

HONORS SUMMER MATH CAMP

Nurturing high school students to degrees and careers of excellence and leadership in math, science, and engineering

The 23rd annual Mathworks Honors Summer Math Camp (HSMC) was once again a great success, hosting 60 high school students in the Texas State University-San Marcos campus. The students benefited from an immersive learning experience that fosters:

- Rigorous reasoning and logic
- Creative problem-solving abilities
- Excellent teamwork and collaboration
- Mindsets to tackle open-ended questions
- Great communication and presentation abilities

These high school scholars were taught by university faculty, mentored by undergraduates, and they shared the joy of mathematical discovery with their peers.

"At the HSMC I got to solve challenging math problems and learn more about math. By solving the problems myself I have learned how to solve similar problems. And that in order to succeed, I have to continue to try even if I do not get the answer the first time.

By meeting so many others who enjoy learning, I am convinced that I want to purse a math or science degree in college, since it will allow me to be more creative and challenge me to learn more"

- Michaela, 9th grader

Opening up the possibilities and potential of mathematics to students who may have never considered pursuing STEM before has been one of Mathworks' top priorities since its founding. It is crucial that students of all demographic backgrounds to have an opportunity to become creators —and not just consumers—of tomorrow's innovations. In order to achieve this vision, we realize it's vital to grow the talent pool through building a strong mathematical foundation.

We must continue to offer opportunities that inspire, engage, and retain students. The high school scholars in the 2012 HSMC gained experience in in-depth mathematics typically taught at the undergraduate level. These young students were supported by an integrated network of mentoring and academic guidance that included:

- Professors teaching courses emphasizing higher-level thinking and problem-solving
- Undergraduate mentors who themselves are majoring in STEM subjects
- Guest speakers who were experts in their fields in academia or industry
- Peers who share similar interests and ambitions
- Original research experiences tying theory to practice

MATHWORKS LEGACY CAMPAIGN

BUILDING FOUNDATIONS FOR FUTURE GENERATIONS OF MATH & SCIENCE INNOVATORS

In November of 2010, the Mathworks Advisory Board launched our Legacy Campaign, with a $6M endowment goal in mind. Thanks to the vision and generosity of foundations, corporations, and alumni and parents, we have now reached 25% of the goal. We continue our efforts to match the $1.2M challenge previously pledged by the Kodosky Foundation.

Most recently, the KLE Foundation pledged a $350,000 match challenge to help endow a "KLE Mathworks Teacher/Student Development Program". This has the key goal of establishing the template from which to replicate the Mathworks Algebra Program at sites across the state of Texas.

As recommended by the National Science Foundation, to provide opportunities for excellence to all students, "we must offer **coordinated, proactive, sustained** formal and informal interventions to develop their abilities".

We deeply thank those who have supported our programs for today's students, and ask that you join us in our efforts to provide sustained opportunities for tomorrow's students . Together we can build the foundations on which all students can reach for their highest goals and ambitions, and to strive for dreams they thought previously impossible.

Mathworks Legacy Campaign
$1.5M raised as of August 2012

Join us in building foundations for future generations of students!

"There is a problem in this country when celebrities and other national figures practically brag that they don't know science and math. People wouldn't advertise their illiteracy but they seem happy to admit their innumeracy. This does not bode well for the future of the U.S. in today's highly technical world.

We need to do a better job of educating our children in science and math, not only to produce the scientists and engineers we will need in the future, but to raise the level of understanding in the general population."

- Jeff Kodosky, co-founder of National Instruments and Mathworks Advisory Board member

"Part of the reason for supporting Mathworks is to look at every way we can to let kids know, and let parents know, about the opportunities that are out there for them if they get a good math foundation, and pursue science, engineering, and technology. After English, math is probably the most fundamental area of knowledge people need.

Out of all the Mathworks programs, the ones most important to the KLE Foundation is the teacher training and outreach to schools with large populations of under-served students. Having teachers trained with the Mathworks approach to get more kids to take algebra sooner, and to prototype that model into the historically smaller, underprivileged, and lower performing schools."

- Eric Harslem, KLE Foundation

Endowment Donations

Received Sept. 2011 - August 2012

Foundations & Individuals

Blake Ford
Bob Rutishauser
desJardins/Blachman Fund
Ingram Family Foundation
Kodosky Foundation
Lisa Lefkowitz
Mollusca Fund
RGK Foundation
Sarah & Ernest Butler

Alumni Donations

Bryan Eastin
Bugao Xu and Helen Huang (for Lily and Michael Xu)
Dung-Tsa Chen (for Wei Wei chen)
Eli Hurowitz (for Jonathan Hurowitz)
Erik Feng
Genbao Shi & Amy Chen (for Millie Shi)
Griselda Gonzales (for Jon Gonzales)
Henry Wang (for Annabel Wang)
Ilya Sherman
Jane Hedgepeth (for David Price)
Jeffrey Middleton
Jianwei Liu and Li He (for Dan and Ying Liu)
Jingyi Shao
June & Ed Malachosky (for Chris Malachosky)
Kris Kazlowski
Kuen Ming Chu & Mei Ling Wang (for Sophia Chu)
Mark & Barbara Kazlowski
Michelle Senatore
Sharon Xie (for Bobby Shen)
Peng & Sharon Zhang (for Mark Zhang)
Stephanie Chan
Stephen Ferns (for Gabe Ferns)
Susan Buck Hawthorne
Victor Cepeda
Wen-Jing Lin (for Jennifer and Jessica Lin)
Wenyaw Chan & Alice Chuang
Yuk Tsang (for Tiffany Tsang)

OPERATIONAL FUNDING DONATIONS

Sept. 2011 - August 2012

In addition to our efforts to establish an endowment to reach out to young students for years to come, we continue to strengthen partnerships old and new in the near-term to sustain the day-to-day operations of raising the level of mathematics education for all. We deeply thank the following organizations and individuals for supporting Mathworks operational funding during the past fiscal year. Together we provided opportunities for young minds to be engaged in mathematical discovery and learning.

Organizations & Individuals

3M
American Math Society Epsilon Fund
Elizabeth Lessels
Google RISE
H-E-B Tournament of Champions
Howard Falkenberg
Jim Smith
KDK-Harman Foundation
Kinder Morgan Foundation
Kodosky Foundation
Rackspace, Inc.
Rhino Graphics
San Marcos CISD
Sid W. Richardson Foundation
Silicon Labs
South Texas Money Management, Ltd.
Texas Workforce Commission Summer Merit Program
Time Warner Cable - Connect a Million Minds
Tokyo Electron, Ltd.
Varsity Tutors

Alumni Donations

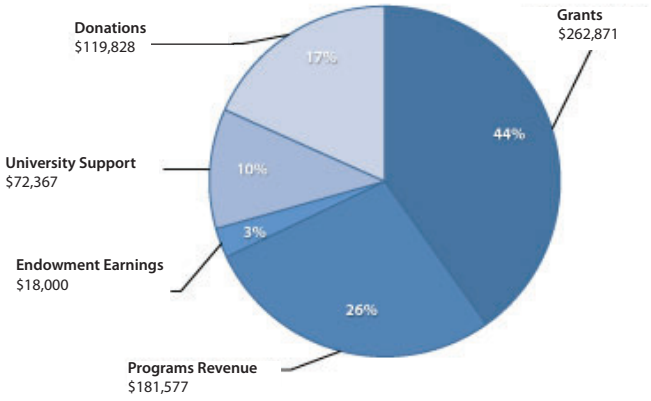
Ben Salinas
Cody Patterson
George Qi
Greg Malecha
Greg Stoll
Hannah Chung
Helen Zhang
Herb Carter
James Yang & Betsy Lin (for Alex Yang)
Jenny Chen
Lauren Lee (for Kevin Chang)
Michael Nanney
Rachel & Carl Berg
Sarah Spikes
Stephen & Mary Rao
Victor Cepeda

THANK YOU!

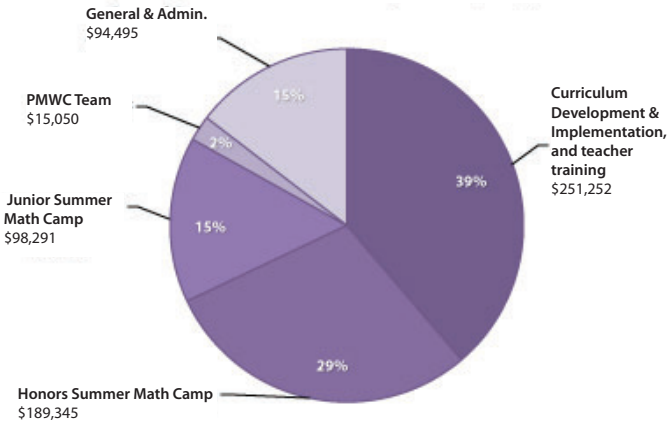
FINANCIALS

Sept. 2011 - August 2012

Total funding received: $654,643



Total expenses: $648,433



Together we:

- Laid the foundations for **an entire middle school, of more than 750 students,** to raise the level of mathematics achievement through our Curriculum Development & Implementation
- Provided professional development and ongoing training to **more than 10 middle school math teachers**
- Fielded a team that competed at the **international level** in the Primary Math World Contest and achieved first place in the team category
- Engaged and motivated **more than 220 young students** through our Junior Summer Math Camp
- Nurtured and developed **60 high school student scholars** in our Honors Summer Math Camp
- Impacted **more than 320 middle school students** through our Mathworks Math Contest
- Built the foundations for all students to be able **to pursue and persist in** future degrees and careers in math, science, and engineering

From foundations to enduring legacies

More than 60% of this past fiscal year's funding came from grants and donations. As is the nature of grant funding, the sources and amounts vary from year to year. This further underlies the importance of completing our $6M endowment goal, thereby **providing ongoing support for opportunities to young students for years to come.**

It is imperative that we provide "coordinated, proactive, **sustained** formal and informal interventions" in order to nurture and develop all students to their fullest potential.

At Mathworks, we realize that outreach to and development of students of all socioeconomic backgrounds is not a one-time, or one year, event. It is by continually providing students with a clear pathway of what they need to do to further pursue STEM—in middle school, high school, college, and in a career—that we are able to nurture students to reach for their highest goals and ambitions.

It is only with the support of thoughtful and visionary individuals and partners that together we are able to **nurture and develop the next generation of innovators and leaders in science and technology.**

LET'S KEEP BUILDING TOGETHER.

Mathworks at Texas State University

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

Mathworks programs raise mathematics achievements for all students, while developing future leaders in math, science, and engineering.

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