

Report





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This annual report contains highlights of the Kentucky Center for Mathematics' statewide work from July 1, 2022 to June 30, 2023.

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About Us

MISSION

Our mission is to advance the knowledge and practice of effective mathematics teaching and learning. We provide and develop statewide leadership, facilitate professional learning experiences and cultivate innovation with the aim of improving mathematics education that is grounded in research, centered on practice and focused on learners.

VISION

We envision a world in which everyone is mathematically enlightened and empowered by working with educators throughout the state to evolve and sustain a schoolwide culture of engagement and sense-making.

GOALS

- Leading- Inform, collaborate and cultivate leadership
- Learning- Prepare and develop educators
- Launching- Strengthen and advance math education









Highlights

584

COURSE ATTENDEES

142

PROFESSIONAL LEARNING SESSIONS HELD

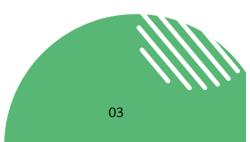
41K

KNP INTERVENTION
GUIDE ACTIVITIES
ACCESSED

235K

KCM WEBSITE
VIEWS FROM 142
COUNTRIES AND 50
STATES

District support took the spotlight in the 2022-23 year. KCM staff diligently worked with teachers and school administrators to pinpoint specific needs and provide tailored support.



X

Letter from the **Executive Director**

It brings me great joy to share with you the remarkable progress and achievements the KCM has made in the past year. It has been a year marked with exciting innovation and collaborative efforts, all aimed at furthering our mission to

transform mathematics education.

One of the most pivotal milestones has been the successful launch and implementation of our Strategic Plan. It has guided our efforts, providing us with a clear roadmap to navigate the ever-evolving landscape of mathematics education. A significant aspect of that work has been the modernization of our online resources, including the acclaimed Kentucky

Numeracy Project (KNP). The KNP has consistently proven to be an indispensable tool for educators, and this year, we have taken steps to update and enhance its content.

We have also expanded our district support initiatives substantially, increasing customized mathematics professional learning programs. This tailored approach meets the unique needs of each district and ensures that our support is relevant and effective. I am particularly proud of the meaningful collaboration we have fostered with Pike County Schools. Together, we have explored research-based Mathematics Teaching Practices, laying the foundation for their full-scale implementation in K-12 classrooms. This initiative holds immense promise and underscores our unwavering commitment to excellence in education.

Seeing its immense success, we have made mathematics coaching a priority to ensure increased student achievement. We have enhanced collaboration with our Mathematics Achievement Fund schools and math coaches. We have also reintegrated Cognitive Coaching, which has transformed our feedback process. This approach has elevated educators, empowering them as mediators of their own professional progress. This innovative approach will have a lasting and profound impact on the educational landscape in our state.

As we look ahead to the future, I am filled with anticipation and enthusiasm as the KMC Strategic Plan comes to life! I would like to extend my deepest gratitude to our exceptional KCM team, dedicated stakeholders, and district, state, and community partners. Thank you for being integral to our journey and for sharing our vision of a brighter and more mathematically proficient future.

> Kelly Delong **Executive Director**

Kentucky Center for Mathematics









Strategic Plan Update

+

strategic plan. With the core mission in mind, the group reflected on how current initiatives were benefiting Kentucky educators and students, considered how the KCM's work could be scaled to expand success, and explored what new and innovative ideas could be used to create programming that solves problems faced in Kentucky's mathematics classrooms.

In November 2022, KCM staff and stakeholders came together to update the center's

Priority Outcomes

KCM TV Increase Math Intervention Support

District Collaboration

Educator Development

KCM Podcast

Update Resources Increase Facilitating Capacity

Elementary





Foundations for Early Childhood (Pre-K)

This course featured content developed by the Erikson Institute, leaders in early childhood education. It highlighted the "Big Ideas" in early mathematics which include sets, number sense, counting, number operations, pattern, measurement and shape.

Explorations in the SEAL (Stages of Early Arithmetic Learning)

This course describes a progression through which young children make sense of quantity, addition, and subtraction. In the introductory session, participants were introduced to SEAL through the use of video exemplars and discussion.

Explorations in the SEAL (Stages of Early Arithmetic Learning)

SEAL courses were offered in an introduction and then application format. SEAL describes a progression through which young children make sense of quantity, addition, and subtraction. In the introductory session, participants were introduced to SEAL through the use of video exemplars and discussion. In this follow-up session, participants connected SEAL to the Kentucky Academic Standards-Mathematics for EITHER Kindergarten or First Grade and explored instructional experiences that support students in meeting those standards.

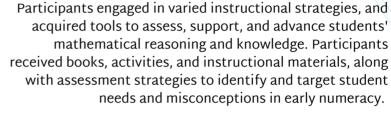
"THERE ARE SO MANY ACTIVITIES THAT
I AM GOING TO INCORPORATE INTO MY
CLASSROOM. IT ALSO REALLY MADE ME
THINK ABOUT HOW MY STUDENTS
THINK AND VIEW MATH."

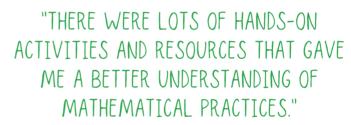
-FOUNDATIONS FOR EARLY CHILDHOOD PARTICIPANT



Elementary







-COMPREHENSIVE COURSE FOR PRIMARY PARTICIPANT

Explorations in Geometry (K-5)

Geometry is a critical area spanning all elementary grade levels with connections to measurement, operations and algebraic thinking, and fractions. Participants deepened their understanding of the Van Hiele Model of geometric reasoning and the Kentucky Academic Standards for Mathematics Geometry standards.

Statistics as a Progression

Statistics is gaining recognition as an important component of mathematics education, from the primary grades to middle and high school continuing to post-secondary. During this course, participants deepened their understanding of statistics and saw the standards and skills of their grade level as part of a progression starting in primary and continuing into middle and high school.

Mastering Manipulatives (K-2)

Manipulatives can be a powerful learning tool to help students discover and represent mathematical concepts. This course explored ways to increase conceptual understanding through the use of concrete and virtual manipulatives

Intermediate

Explorations in Number Talks & Routines (2 & 3)

Aligned to research-based teaching practices and the Kentucky Academic Standards for Mathematics, topics included addition, subtraction and place value from the NBT and OA standards; the use of instructional routines including number talks; and the use of manipulatives, visual models and number lines

Explorations in 3rd Grade Fractions

Grade 3 is a critical year in which students should develop strong conceptual foundations for understanding fractions. During this session, teachers will explored hands-on activities and tasks aligned to the Kentucky Academic Standards for Mathematics designed to support students in developing conceptual understandings of fractions as numbers.

Explorations in Number Talks & Routines (4 & 5)

Topics in this course included addition, subtraction, multiplication, division and place value (NBT and OA standards); the use of instructional routines including number talks; and the use of manipulatives, visual models and number lines. Participants received books, activities and instructional materials including a classroom number line.

Explorations in 4th and 5th Grade Fractions

Intermediate grades are a critical time in which students are expected to develop an understanding of fractions as numbers and make sense of fraction operations. During this three-day session, teachers explored instructional strategies such as the use of manipulatives, fraction models (including number lines) and rich tasks.

"I NOT ONLY DEEPENED MY OWN LEARNING, BUT I NOW HAVE THE ABILITY TO BETTER SUPPORT TEACHERS IN THIS

WORK. "

-EXPLORATIONS IN 4TH AND 5TH GRADE FRACTIONS PARTICIPANT



Intervention

- "THIS COURSE HAS HELPED ME TO GROW IN MY ABILITIES AS

 AN INTERVENTION TEACHER WITHIN OUR DISTRICT. THIS HAS
- BEEN ONE OF THE BEST PROFESSIONAL. LEARNING EXPERIENCES I
- HAVE BEEN A PART OF. THE RESOURCES AND THE INFORMATION
 - PRESENTED WERE EXCELLENT."

-AVMR PARTICIPANT

AVMR

This course is built around Add+Vantage Math Recovery™ and is designed for elementary grades teachers to learn and practice assessments and teaching strategies for advancing students' foundational knowledge of whole number topics such as number words and numerals, structuring numbers, addition and subtraction, and topics that affect the development of future mathematical understanding. A follow-up course is offered to deepen understanding.

MIT Collegial Group

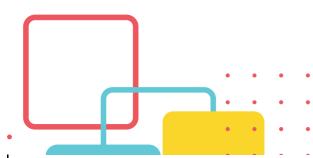
The KCM offers support to Kentucky K-8 math intervention teachers through a Collegial Support Group. The goals of the group are:

- To build a vibrant professional community space for MITs across Kentucky to connect and support one another.
- To come together as a community of professionals to provide the latest in research and resources to support our professional growth.

The MIT Collegial group meets monthly, receives a monthly newsletter, support kits, and participates in an exclusive session at the annual KCM Conference. Participation in this support group is free for Kentucky math interventionists.



ONE OF THREE BOXES OF CLASSROOM FAVORITES DELIVERED TO TEACHERS!



District Support

District support from KCM comes in various forms, such as customized professional learning courses, working with the Kentucky Department of Education to host KY Family Math Nights (KCM provides upwards of \$25k in resources and funds so that schools can implement an effective family math event), and so much more.



"I HAVE CHERISHED OUR PARTNERSHIP WITH KCM OVER THE PAST FEW YEARS. KCM HAS BEEN AN INTEGRAL PART OF OUR TEACHERS' UNDERSTANDING OF THE C-R-A FRAMEWORK. BECAUSE OF THIS WORK WITH KCM, WE ARE SEEING GROWTH IN THE MATHEMATICAL INSTRUCTIONAL PRACTICES BEING UTILIZED BY OUR TEACHERS, AND THIS IS LEADING TO INCREASES IN STUDENT ACHIEVEMENT IN MATHEMATICS."

-DUSTIN WHITIS, PRINCIPAL, BRECKENRIDGE-FRANKLIN ELEMENTARY

"TWENTY TEACHERS PRESENTED INFORMATION ABOUT THEIR SUCCESSES DURING THEIR FALL FAMILY MATH EVENTS. COLLEAGUES WERE ABLE TO WALK AWAY WITH A BANK OF NEW IDEAS AS WELL. WE ARE NOW PLANNING FOR OUR SPRING EVENTS AND LOOKING FORWARD TO INCREASING FAMILY ENGAGEMENT AND STUDENT SUCCESS ACROSS KENTUCKY."

-LISA RIGGS, KCM REGIONAL CONSULTANT



District Support



Letcher Co.

When Kentucky Math Teacher Leader
Amanda Holbrook, of Martha Jane
Potter Elementary, reached out to
KCM about their school being
ravaged by disastrous floods in Eastern
Kentucky, the KCM jumped right in by
sending any and all needed resources that we
could provide.

KCM worked with district personnel and instructional coaches to plan and deliver professional development on key Kentucky Academic Standards in the framework of helping teachers improve their use of classroom discourse.



Lincoln Co.

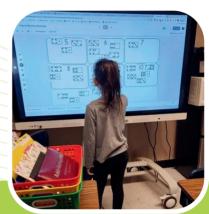
"I RECENTLY SURVEYED OUR ELEMENTARY SCHOOL PRINCIPALS TO PROVIDE FEEDBACK FROM THEIR TEACHERS REGARDING OUR WORK WITH KCM AND THEY WERE OVERWHELMINGLY POSITIVE: 'WE CAN'T GET ENOUGH. PLEASE CONTINUE SETTING ASIDE FUNDS TO COVER THESE WONDERFUL LEARNING OPPORTUNITIES.' AS A DISTRICT, WE FEEL OUR PARTNERSHIP WITH KCM IS TRULY TRANSFORMING MATH LEARNING FOR OUR STUDENTS."

-MATT PERKINS, ASSISTANT SUPERINTENDENT, MUHLENBERG COUNTY SCHOOLS



District Support

on the Kentucky Academic Standards, diving deep into clarifications and alignment to the Standards for Mathematical Practice.



Jefferson County
Public Schools



Pike Co.

Pike County Schools administrators worked closely with KCM to implement Kentucky Academic Standards and Mathematics Teaching Practices district wide.



The KCM staff feels privileged to be able to continue to collaborate and work with our wonderful district leaders and educators to support our math vision in our schools and districts.





Collaboration: Kentucky Educational Cooperatives

The KCM is able to best serve the teachers and students of Kentucky through building strong partnerships and collaborations with leaders in the field of education innovation. Some of those partnerships include:

KVEC

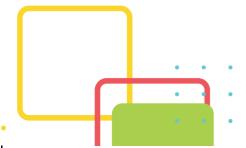
The Kentucky Valley Educational Cooperative (KVEC) and KCM partnered on the KDE Mathematics Teaching Practices Grant. This grant provided professional learning for teachers across the Commonwealth on the research-based Mathematics Teaching Practices.

KEDC

The Kentucky Educational
Development Corporation (KEDC) and
KCM collaborated to provide four
mathematics professional learning
courses for district members. Our
focus was the Ashland and Lexington
region. Truck loads of math materials
were delivered to both sites to equip
teachers with the resources they need
for vibrant classrooms.

GLEC

Greater Louisville Education Cooperative and KCM worked in tandem to support Breckinridge-Franklin Elementary School. Together, we provided customized professional learning monthly. In addition, there was a focus on the Kentucky Academic Standards with particular interest in math tools for conceptual understanding. KCM appreciates the collegiality of GLEC as they partnered for school success.



Math Fact Fluency

In 2020, KCM began working closely with author of the book Math Fact Fluency, Dr. Jennifer Bay-Williams, Professor at the University of Louisville, to scale her work to mathematics educators across the state of Kentucky. On KCM's Math Fact Fluency website, you will find 40% of the basic fact games and assessment tools found in the Math Fact Fluency book in easy-to-use, printable formats.

Since its inaugural year, the site has seen astounding traffic, providing assistance to mathematics educators from all 50 states and across the globe. Below are statistics for the Math Fact Fluency site in 2022-23.

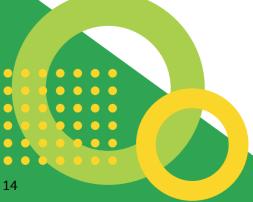


29,956

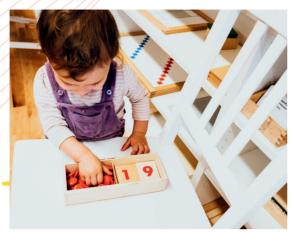
47,285

148,809

PAGE VIEWS









Mentoring

Dr. Sarah Kasten, associate professor of mathematics education at Northern Kentucky University, and Dr. Bethany Noblitt, professor at NKU, have played a crucial role in supporting the KCM through educational mentoring, program development, and evaluation. They offered valuable guidance and expertise in mentoring practices to various members of the KCM staff, including the executive director, director, program manager, and regional consultants. These mentoring sessions provided a platform for the staff to engage in discussions and refine their mentoring skills. The KCM utilized the educative mentoring training provided to support math coaches involved in the Mathematics Achievement Fund (MAF) and Kentucky Math Teacher Leaders (KYMTL) programs.





Middle School

Routines for Reasoning- Middle Grades (5-8)

Aligned to research-based teaching practices and the Kentucky Academic Standards, this course used instructional routines to give participants specific and repeatable designs for learning that support both the teacher and students in the classroom. Reasoning routines for the middle grades are designed to improve student problem solving, build crucial mathematical thinking habits, and improve classroom discourse.

Building Numeracy- Middle Grades (5-8)

This year-long, in depth course provided teachers with information and materials to enable them to strengthen mathematics instruction by building from students' current funds of knowledge. Participants learned teaching strategies for helping students develop the more sophisticated reasoning needed for middle grades mathematics with the goal of improving student access to grade level content.

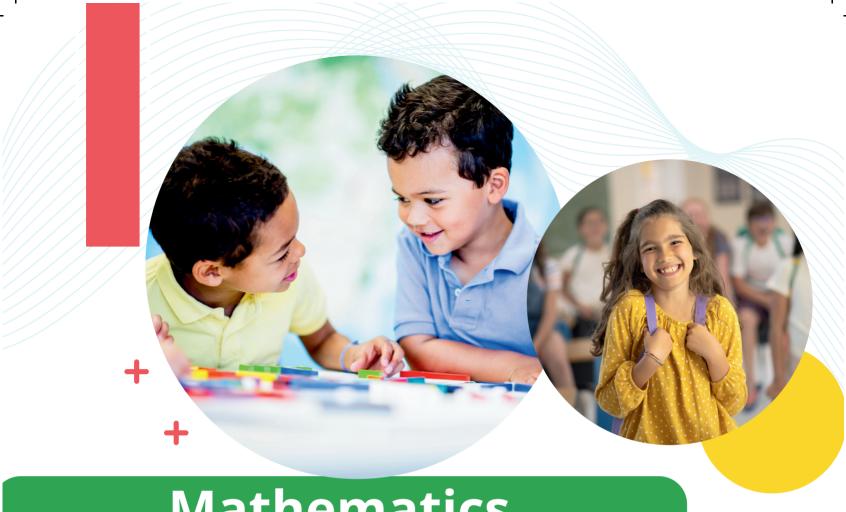
Modeling WITH Mathematics (6-8)

Modeling with mathematics is one of the most misunderstood Standards for Mathematical Practice, yet it is essential for ALL students to master. Participants experienced an instructional routine that builds students' capacity to make sense of models and to develop questions to ask themselves when modeling.

Statistics as a Progression

During this course, participants deepened their understanding of statistics and looked at the standards and skills of their grade level as part of a progression starting in primary and continuing into middle and high school. The KCAS- Mathematics also position students as doers of statistics as they take part in the production, interpretation, and communication of data.



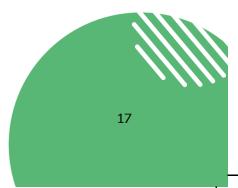


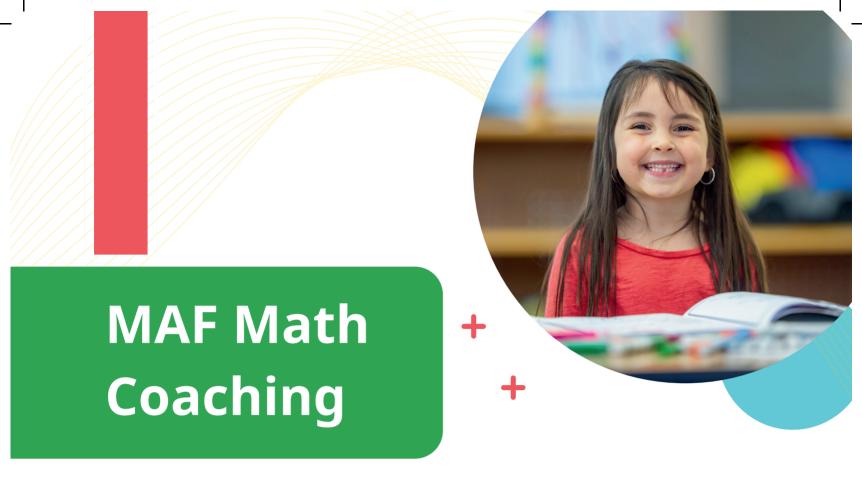
Mathematics Achievement Fund

The KCM supports the work of the Kentucky Department of Education through focused professional learning opportunities, teacher coaching and resource sharing.

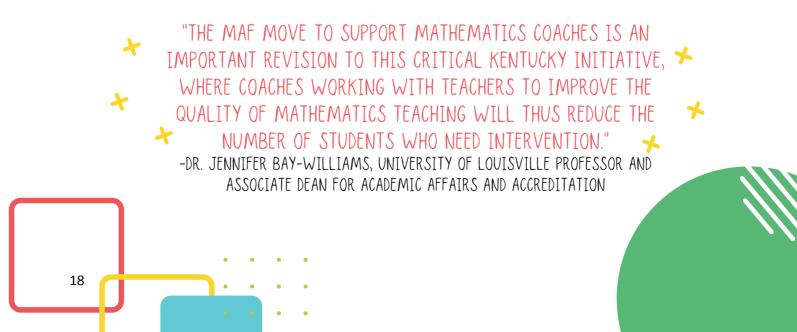
KCM supported the MAF schools in the following ways:

- Professional development courses which focused on diagnostic assessment and intervention programs
- Coaching teachers in research-based mathematics instruction
- Effective ways to communicate with parents regarding mathematics via Kentucky Family Math Night events





The first phase of the MAF grant provided funding for the training and release time for Kentucky math teachers to serve as coaches for other Kentucky educators. Defined by the Kentucky Department of Education (KDE), a MAF coach is "a mathematics leader whose primary responsibility is to provide ongoing support for mathematics teachers." According to Erin Chavez of KDE, "MAF coaches work hard to make their schools' mathematics vision statement a reality by offering intensive school-based professional learning and individualized coaching support. These mathematics coaches will improve mathematics teaching practices by working with teachers in their classrooms, observing practices and providing feedback, modeling appropriate and evidence based instructional practices, conducting workshops, and ensuring that high-quality instructional resources are aligned to the Kentucky Academic Standards for Mathematics." With these guidelines in place, the needs of primary students and other students who are struggling to meet grade level standards in mathematics can be met.



High School

High School Modeling

- + This course provided an opportunity for classroom teachers of students in grades 9-12 to learn, understand, apply the modeling process as well as the standards for mathematical practice for students. Participants explored lesson tasks that included algebra and
- statistics topics as well as creating Aligned to the Kentucky Academic Standards, this course equips classroom teachers to promote development of Standards for Mathematical Practice #4: Model with Mathematics. The outcome is a vibrant classroom where students see mathematics in action.

"THE EXAMPLES PROVIDED
MADE ME REFLECT ON MY
TEACHING AND HOW I
WASN'T ACTUALLY
MODELING."

-HIGH SCHOOL MODELING PARTICIPANT



Faculty Associate Spotlight



Dr. Dee Crescitelli



Dr. Funda Gonulates KCM Faculty

Dr. Crescitelli and Dr. Gonulates contributed a chapter to the book **Success Stories in Catalyzing Change**. Each story shares an approach addressing one or more of the four key recommendations from Catalyzing Change. These stories share efforts at the district and state levels as well as within schools and highlight the challenges and successes of implementing equitable teaching practices in classrooms everywhere.

Dr. Marin, Dr. Gonulates, and other faculty associates have been collecting data on KyMTL participants' experiences in the program and the ways in which their professional work has been impacted. .

The purpose of this study is to learn about the experience of participants in the Kentucky Math Teacher Leaders project. This study will investigate the professional growth and learning of participants, as well as the impact of the program on math teacher leaders from across the Commonwealth of Kentucky.



Dr. Kate Marin

KCM Faculty
Associate





KyMTL, Kentucky Mathematics Teacher Leaders, was officially launched in July 2020, in response to the scaling initiatives brought forth in KCM's new strategic plan. This collection of enthusiastic classroom educators exhibits unwavering dedication to mathematics education. They are handpicked and guided by the KCM to collaborate with like-minded teachers from across the Commonwealth, refining and broadening their skills in leadership, mathematics content, and pedagogy.

On July 11, 2023, KyMTLs convened for a day to revitalize their leadership abilities, deepen their understanding, and reaffirm their dedication to advancing mathematics in the state of Kentucky. The leaders immersed themselves in exercises using comprehensive strategies as experts shared insights on nurturing a growth-oriented learning mindset. Outside of the summer workshop, the KyMTLs meet monthly and attend a winter workshop, staying committed to strengthening the skills needed to lead change in their classrooms, schools, and beyond.

Spiraling Up to Leadership Roles



Jane Goatley



Sean Jordan *Jefferson Co.*



Holly Lawrence



Brittany BealJefferson Co.



Stephanie Lyon Boyd Co.



During the Family Math course, participants explored research on family engagement and how to educate parents concerning math fluency and the current standards.

- Attendees learned family math resources and how to conduct a family math night event.
- Participants were given materials to conduct 2 Family Math Nights one per semester.
- Participants then implemented two Family Math Nights at their school.
- Participants shared their successes and takeaways from each of their Family Math Nights.



"I LEARNED MORE ABOUT
THE SKILLS NEEDED IN EACH
GRADE LEVEL AND I LEARNED
HOW MUCH HANDS ON
LEARNING IS ENJOYED BY
STUDENTS!"



"Kelly DeLong, KCM Executive Director, was such a blessing that evening as she stepped right in and ran our Growth Mindset booth for us! Many of our math game booths and activities were lead by our K-3 students. We were so proud of our primary students as they exhibited leadership skills in assisting other students and their families in playing the math games and seeing how ACPC students are learning math conceptually."







Grants

Algebra 1 Micro-Credential Grant

In July, educators from seven districts in the commonwealth gathered with members of the Kentucky Department of Education, KCM, as well as XQ Institute and partners, to launch an innovative two year pilot microcredential badging system that will shift the learning in schools to a more equitable mindset. Gathered together in Lexington, district leaders and Algebra 1 teachers worked through thought-provoking activities to brainstorm the best ways to improve Kentucky learning.

"OUR TEAM DESIGNED A SUCCESS-ORIENTED ASSESSMENT SYSTEM THAT ATTEMPTS TO CENTER LEARNING OVER COMPLIANCE. WHEN I WAS TEACHING HIGH SCHOOL MATH, THE QUESTION THAT I USED TO DECIDE HOW AND WHAT TO TEACH WAS, 'HOW DO I GIVE EVERY CHILD WHAT THEY NEED TO KEEP MOVING FORWARD?' THROUGH BADGING, I WANT MORE TEACHERS ASKING THIS QUESTION."

-SHELBI K. COLE, PH.D, DESIGNER, STUDENT ACHIEVEMENT PARTNERS





KCM aligned all math badges to the Kentucky Academic Standards. The micro-credential framework will include six achievable badges that are based on Kentucky Academic Standards (KAS). It enables educators to collaborate and co-create methods for implementing the badging curriculum while aligning the classes to best meet the students' needs. Each badge framework features three central components:



Mathematical Content & Practice Expectations

2 Learning Principles

Evidence of Learning

PUTTING EMPHASIS
ON WHAT REALLY
MATTERS: STUDENTS
DEMONSTRATING
THEIR LEARNING.







Online Resources



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Kentucky Center for Mathematics



The Kentucky Center for Mathematics

Online Resources Include:

- KY Family Math
- · Resources for Virtual Instruction
- KCM Virtual Professional Development
- Kentucky Numeracy Project Intervention Guide
- KCM Fluency Assessments
- Math Fact Fluency

The KCM has developed a robust platform of online resources and websites for continued support of participating educators. These online resources include assessments and research-based activities.

All these and more are available in a database that can be searched by standard, grade level, fluency benchmark, task group or setting.

KCM YouTube Channel







Conference

The 2023 KCM conference - "Empower: Building United Mathematical Communities" - was held at the Hyatt Regency in Lexington, Ky, March 6-7, 2023. The KCM community was thrilled to return to a fully IN PERSON conference! The theme reflected this excitement, celebrating the power of unity within Kentucky's mathematics communities.

KCM KCM CONFERENCE

Empower:
Building United
Mathematical
Communities







OUTSTANDING SPEAKERS!



- 1. **Dr. Sarah Bush**, professor of K-12 STEM Education and program coordinator of the mathematics education Ph.D. track at the University of Central Florida.
- 2. **Dr. Kyndall Brown**, executive director of the California Mathematics Project.
- 3. **Dr. Barbara Dougherty**, professor in mathematics education and the past director of the Curriculum Research & Development Group at the University of Hawaii.
- 4. **Dr. Amanda Jansen**, professor in the mathematics education program in the School of Education at the University of Delaware.
- 5. **Deborah Peart**, founder of My Mathematical Mind and speaks on a variety of topics related to math identity, elementary math content and instruction, and literacy connections to mathematics.









WELCOMING GUESTS FROM ACROSS THE

COUNTRY

Uniting our community

The conference was attended by 480 educators from across the U.S., representing grade levels from preschool through postsecondary. Over 79 Kentucky school districts and nine Post Secondary institutions were represented . The two-day event featured over 80 breakout sessions.









"MY NEW TEACHERS FELT MOTIVATED WHEN COMING BACK TO SCHOOL. WE GOT TO EXPERIENCE SOME THINGS SUCH AS MATH NATION WHICH WE ARE USING NEXT YEAR. THERE ARE ALSO SOME ACTIVITIES THAT HAVE BEEN BROUGHT BACK WITH US AND INCLUDED TO HELP OUR STUDENTS."



Research



MAF Math Coaching Data

- Very promising math coaching data help retain teachers
- 13 math coaches
- 92 teachers participated
- 279 classroom observations using the Kentucky Mathematics Innovation Tool
- ~5,000 students impacted
- June 2023 data





Number of teachers
who grew
at least 1 level

Budget

Source of Funds	\$1,556,648.00

 State Funds
 \$1,323,000.00

 Generated Revenue
 \$233,648.00

Use of Funds	\$1,625,650.61
Teacher Professional Development - State	\$816,899.26
Teacher Professional Development Services	\$71,671.13
Teacher Resources	\$254,899.02
Salaries/Wages	\$312,908.00
Benefits	\$144,680.08
Operating Expenses	\$24,593.12









