

# ANNUAL ANNUAL A VEAR OF INNOVATION



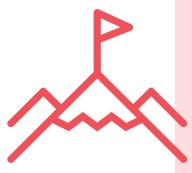
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# A Year in Review

This annual report contains highlights of the Kentucky Center for Mathematics' statewide work from July 1, 2020 to June 30, 2021.

### **About the KCM**



#### 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

# 2020-21 Highlights

PROFESSIONAL LEARNING ATTENDEE HOURS



FAMILY MATH SESSIONS



MATH FACT FLUENCY USERS



#### WEBSITE VIEWS

# 336,155

# Letter from Executive Director

Dear Kentucky Math Education Stakeholders,

As Executive Director of the Kentucky Center for Mathematics, I am excited to focus this issue of the KCM Annual Report on Kentucky educators. This year, our educators have displayed a steadfast dedication to



excellence in an ever-changing landscape. National education expert, Angela Duckworth, defines the trait of **GRIT** as passion and perseverance for long term goals. Our KCM educators (Regional Consultants, teachers, administrators and Faculty Associates) have shown tremendous passion and perseverance for actualizing our ultimate mission of advancing the knowledge and practice of effective mathematics teaching and learning in the classrooms of Kentucky.

Let's take a closer look at this GRIT in action across the Commonwealth:

Passion	<ul> <li>Under the leadership of Regional Consultant, Cindy Aossey, KCM created online resources to support virtual learning, guided by classroom teacher requests. You asked for it. KCM created it.</li> <li>Danielle Warren, Mathematics Instructional Coach at Breckinridge-Franklin Elementary School, conducted professional learning in collaboration with KCM, implementing Number Talks during remote learning. In my opinion, their work is among the best in the state.</li> <li>Rachel Yost, Elementary Teacher in Harlan County, led professional learning supported by KCM to integrate mathematics and literacy. District Wide Program Director, Jeanne Lee, said, "A beautiful partnership saw the rise of teacher leaders and the increased knowledge of math literacy and practices. The KCM work brought together math teachers across the district in a way that developed sustainable professional relationships." We are certainly proud of this work in Harlan County.</li> </ul>
<u>Perseverance</u>	<ul> <li>Caroline Broering, KCM Administrative Assistant, single-handedly boxed and shipped thousands of math materials to teachers all over the Commonwealth of KY.</li> <li>Team KCM created a companion website for the national bestselling book, <i>Math Fact Fluency</i>, by KY's own Dr. Jennifer Bay-Williams. The virtual materials have expanded KCM outreach to a global audience.</li> <li>Shout out to the 92 MAF Math Interventionists who persevered over the odds to create engaging online experiences for primary students. Nick Harris, MIT Madison Kindergarten Academy, elevated his students to proficient levels in a virtual setting. That is excellence in action.</li> </ul>

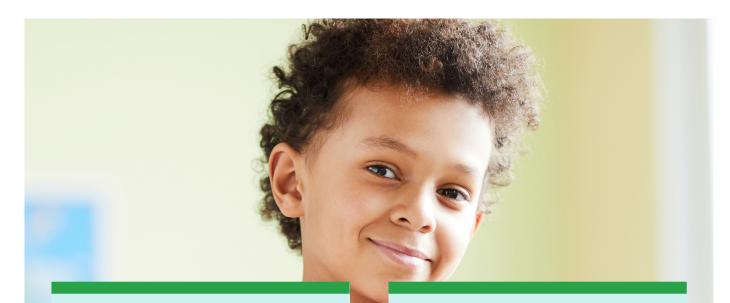
The Kentucky Center for Mathematics has always been about serving the mathematics educators of Kentucky. This annual report is dedicated to all of those who showed **GRIT** with passion and perseverance during the challenges presented this past year. **We celebrate you!** 

**Executive Director** 

Kentucky Center for Mathematics

## Elementary

KCM elementary-focused courses function to prepare teachers to effectively support student learning, encourage unique student thought processes and build on concepts children have worked to master. Each elementary course is designed with specific principles to accomplish these goals.



#### Individualized Instruction

Participants leave KCM courses with the ability to identify and support the different ways young children make sense of mathematical reasoning.

#### **Commitment to Equity**

KCM courses prepare teachers to create a learning climate that welcomes questions, opinions and participation of all students.

#### **Strategy Toolbox**

Educators engage in varied instructional strategies and acquire tools to assess, support and advance students' mathematical reasoning and knowledge.

#### **Knowledge Continuum**

Through KCM professional learning, teachers are able to grow their understanding of effective ways to scaffold and differentiate instruction to better accommodate student needs.

# **ELEMENTARY**

Elementary courses are tailored by grade level and are designed to build on strategies and understandings developed in previous grades. Number talks and problem strings are used by teachers to explore opportunities to develop reasoning, a deeper understanding of properties and extend these understandings in future grade levels.

> "As a Math Recovery Leader, Comprehensive Primary facilitator, and Mathematical Teaching Practice module developer and facilitator, I have been given the opportunity to come alongside teachers from across the state as they dig into pedagogy, reflect on best practices and grow professionally. It is my honor and privilege to do this work. "

-Lisa Riggs, KCM Regional Consultant

Teachers explore hands-on activities designed to support students in developing conceptual understandings through the use of manipulatives and rich tasks.

"The techniques used help me to understand some of the standards that I had been struggling to teach."



# ELEMENTARY

The KCM offers many professional learning experiences tailored toward elementary grade educators. In these courses, participants engage in varied instructional strategies and acquire tools to assess, support and advance students' mathematical reasoning and knowledge.

2020 - 2021 elementary course offerings included:



#### **INTERMEDIATE (GRADES 3-5)**

- Explorations in Math Routines & Number Talks for Intermediate Grades
- Explorations in 3rd Grade Multiplication and Division
- Explorations in 4th & 5th Grade Multiplication and Division

#### PRIMARY (GRADES K-2)

- Comprehensive Course for Primary Grades K-2
- SNAP (Student Numeracy Assessment Progressions)
- Explorations in the SEAL (Stages of Early Arithmetical Learning) for Kindergarten





- Explorations in 3rd Grade Fractions
- Explorations in 4th and 5th Grade Fractions
- Explorations in Algebraic Reasoning for Grades 3-5

"As a newer teacher to the grade level, I feel this training has made me more confident in my ability to teach and approach number talks and math with the kids."

# ELEMENTARY



"Despite the overwhelming consequences of the pandemic, this global crisis has also been an extraordinary time for learning. I was honored to be a part of how teachers quickly reimagined human connections and interactions to facilitate learning. We were able to support teachers in making this transition by sharing and creating tools for virtual manipulatives and being a sounding board for new ideas and approaches."

-Julie Adams KCM Regional Consultant

The KCM worked to support teachers facing virtual and hybrid instruction through creating:

- A webpage of virtual resources
- A YouTube channel with video instruction tutorials
- JamBoards for virtual instruction
- Virtual book studies
- Updated course curriculum
- A virtual conference with recorded sessions and free registration for all teachers

"I have been struggling with how to teach math virtually and incorporate number talks and this provided me with the information I needed to make it meaningful and useful resources for doing so virtually."

### Intervention



"We learned to adapt and adjust what we were doing to reach our students."

KCM Intervention courses deliver intensive mathematics intervention that prepareteachers in effectively helping students at different ability levels.

Expertise is developed in mathematics, through study, practice, collegial reflection, and application of tools and strategies for assessing and advancing student knowledge.

### Intervention Courses Included:

- MRIS (Math Recovery Intervention Specialist) Course

- KNPI (Kentucky Numeracy Project Intensive) Course

- AVMR (Add+Vantage Math Recovery®)- Data & Instruction (AVMR/KNPI Graduates)



"I was able to train about 175 teachers in researchbased strategies to help struggling students in mathematics. This warms my heart to know that the students of Kentucky will benefit from these sessions and become better problem solvers in the world." -Tonda Thompson, KCM Regional Consultant

# **District Support**

KCM leadership can be found in the field, working with teachers and school administration to pinpoint specific needs and provide tailored support.



### JCPS- AVMR

"KCM's support of our teachers and coaches through the AVMR cohorts has directly impacted the experiences of our Scholars. Because of this learning, teachers are shifting their approaches to early numeracy ensuring equity in mathematics. Students are able to see themselves as Mathematicians as they are challenged to think in new and deeper ways about math concepts, using a variety of strategies, and justify their problem solving methods."

- Michelle Dillard, Assistant Superintendent JCPS

### Grayson County-Caneyville Elementary School

"On behalf of Caneyville Elementary, I would like to say thank you to KCM for the math manipulatives. Our teachers were very appreciative of the kind gesture from KCM."

> -Josh Basham, Principal Caneyville Elementary





### Breckinridge-Franklin Elementary School

"I have valued our collaboration with KCM over the past year. The professional development and feedback that was provided around math instruction in our building was tailored to our specific needs as a school."

> -Dustin Whitis, Principal Breckinridge-Franklin Elementary

# **District Support**

#### Harlan County Public Schools-Mathematics and Literacy

"The KCM has has helped build systemic growth in our K-5 classrooms and beyond. There are not enough words to adequately express the generosity, knowledge, and professionalism that [the KCM] brought to our district and we will be forever grateful!"

#### -Jeanne Lee, HCPS District Wide Programs





### Other locations that received additional support include:

- Collins Lane Elementary School
- Henderson County Schools
- Ballard County Schools
- Marshall County Schools



"Our teacher participants are truly committed to providing access to high quality mathematics for all students. Their efforts are supported by their leadership, and they are making a difference every day for KY students."

-Bonny Riedell, KCM Regional Consultant

# **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-touse, printable formats.

In the site's inaugural year of operation, it saw an astonishing:

#### 29,956 Users

(from all 50 states + DC & 98 countries)

47,285 Sessions

#### 148,809 Page views

During the summer of 2021, KCM welcomed Math Fact Fluency author Dr. Jennifer Bay-Williams for a two-day conference. Additionally, over 1,000 copies of Math Fact Fluency were given to Kentucky teachers to participate in book studies.

"I am very grateful to work on the Math Fact Fluency project. It was an opportunity for me to collaborate, play and create useful mathematics materials for teachers and students." -Dr. Leah Dix, KCM Regional Consultant

JENNIFER BAY-WILLIAMS and GINA KLIN

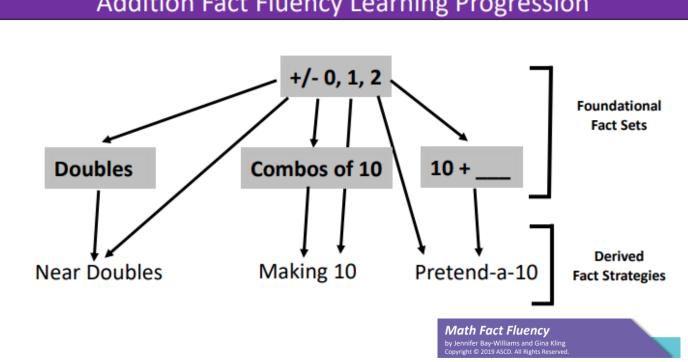
# Math Fact Fluency

"The myriad of high quality experiences available through KCM and the expertise and energy of the leadership and the Regional Consultants help to create a strong infrasture and quality professional learning opportunities throughout the state. It has been an honor to be a part of KCM this past year!" - Dr. Jennifer Bay-Williams, KCM Faculty Associate, Math Fact Fluency Author



"We saw the engagement of our students rise and the excitement grew for practicing math skills. KCM provided us with support all along the way and further training opportunities to help us reach more teachers and more students."

-Chelsey Tingle, Assistant Superintendent, Henry County



### Addition Fact Fluency Learning Progression

# **Mathematics Achievement Fund**



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

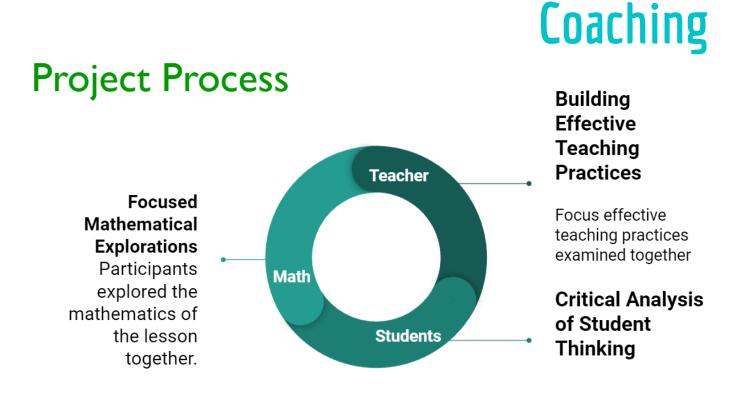
For 2020-2021, much of this work was done virtually, and our Regional Consultants supported teachers through class observations, individual and group meetings, co-teaching and tailored professional learning.

Top 3 Equitable Teaching Practices noted in KCM Coaching Interactions:

- 63% Implement tasks that promote reasoning & problem solving
- 58% Establish mathematical goals to focus learning
- 32% Use & connect mathematical representations

"Recently, we elicited feedback from MAF principals around what is going well with this school year. It was great to hear examples of how the components of the MAF grant are contributing to tier 1 instruction, how collaboration among the MIT and plus two teachers is impacting student learning and ways in which principals are using the PLC process to improve data analysis."

- Erin Chavez, Kentucky Department of Education



#### **Coaching: Explorations in Creating School-Wide Cultures of Sense Making**

Dr. Dee Crescitelli and Dr. Funda Gonulates shared the successes of this coaching course with participants in the NCTM Virtual Conference in February and the NCTM Annual Meeting in April and were also invited to host a roundtable discussion about this initiative. They were able to share the impact that teachers and administrators have observed in classrooms in multiple schools and districts.

#### Coaching Courses offered in 2020-2021 included:

- Explorations in Creating Cultures of Mathematical Sense-Making: Primary focus
- Explorations in Creating Cultures of Mathematical Sense-Making: Middle Grades focus

"This has also transformed the way students see themselves. It is not rare... In fact, it is common to hear students pronounce math as their favorite subject in school. They see themselves as mathematicians because they enjoy the challenges of making sense of what they are doing." -School Administrator

16

on student impact

# Middle School



### 2020 Middle Grade course offerings included:

- Explorations in Reasoning Routines for 6th and 7th Grade
- Foundations for Middle: Grade 8

"I appreciated the blend of research, content and pedagogy and the dive into the mathematics across grade levels."

Middle Grade course offerings provided opportunities for classroom teachers of students in grades 6-8 to learn strategies and acquire tools to advance students' mathematical reasoning.

These courses are strategically created to give participants specific and repeatable designs for learning that support both the teacher and students in the classroom. Participants gained a greater understanding of how to support students in developing mathematical reasoning. All courses are aligned to research-based teaching practices and the Kentucky Academic Standards. Instructional strategies were introduced to improve critical thinking, problem solving and classroom discourse.

"We were able to provide support for teachers throughout the entire school year-- I am proud of US as a whole team for this. Teachers are showing up for optional things this year with stories of learning and loving math even with the struggles of virtual last year. We were able to connect with enough of them to make a difference."

-Dr. Dee Crescitelli, KCM Director



# **High School**



The 2021 KCM Conference increased the focus on high school content in order to engage our high school teachers and to highlight the amazing content available to educators.

KCM Director Dr. Dee Crescitelli led a middle-high school focused session entitled **"Using Debate Math to Improve Student Reasoning and Explanation Skills."** In this session, participants examined the benefits of having students make their own conjectures and build arguments and explanations for them. This format was used to show how to ask and answer questions to improve our mathematical arguments.

"Model with Mathematics: A Study in Water" was a high school focused conference session led by KCM Faculty Associate Dr. Bethany Noblitt. In this session, participants used mathematical modeling to learn about water conservation and a recent water crisis. Participants were asked to think critically about the following questions: What can we do to save water? What has been done to help others who need water? Is it enough? By answering these questions, participants learned more about what mathematical modeling is...and is not.

# **Post-Secondary**

#### Mentoring with Dr. Sarah Kasten and Dr. Bethany Noblitt

In the spring of 2021 Sarah Kasten and Bethany Noblitt met with an engaged and motivated group of six mentor teachers across Kentucky who were each hosting and working with either a preservice middle or secondary clinical experience teacher candidate in their classroom. Via modules presented on Canvas, the mentor teachers studied and discussed the tenets of educative mentoring (Feiman-Nemser, 1998), learned about and chose an effective teaching practices as a focus, and enacted three coplanning and debriefing cycles with their preservice teachers. In addition to their individual work, the whole group met virtually for five study group sessions between January and May to support one another and discuss ways that each mentor teacher could grow in their mentoring practice toward being more educative.



"I'm so grateful that the KCM has given me the opportunity to work with so many amazing teachers across Kentucky, especially in the Kentucky Mathematics Teacher Mentors program. It's been rewarding both professionally and personally."

-Dr. Bethany Noblitt, KCM Faculty Associate

### **Faculty Associate Spotlight**

Our math education experts who are making a difference for Kentucky teachers.



FUNDA GONULATES KYMTL TEACHER LEADERSHIP

"Working with KCM always keeps me grounded and wellinformed about practical needs and concerns."



KANITA DUCLOUX CATALYZING CHANGE IN MATHEMATICS EDUCATION "As teachers, you are in the unique position to be a catalyst for change in mathematics!"



EQUITY MODULES FOR IN-SERVICE TEACHERS "Students ultimately come to view themselves as capable, young mathematicians and this opens doors to incredible horizons for them, and for us \_\_\_\_\_\_as a society."



SARAH KASTEN MENTORSHIP OF PRE-SERVICE TEACHERS

"I am truly grateful to work with KCM and find the intersections between their strategic goals and my own professional interests."



#### BETHANY NOBLITT MENTORSHIP OF PRE-SERVICE TEACHERS

"I have met some wonderful teachers and worked with them to improve mentoring skills as we work with preservice teachers in the classroom."



EDNA SCHACK FAMILY ENGAGEMENT IN EASTERN KENTUCKY "The KCM allows me to work in my passion, family engagement"



JENNIFER BAY-WILLIAMS MATH FACT FLUENCY AND TEACHER LEADERSHIP "As a new KCM Faculty Associate, I have come to appreciate at a much y deeper level the impact that KCM has on mathematics learning in Kentucky."

# **KY Family Math Night**





"KCM made hosting a family math night easy and successful. KCM helped to provide tools for planning and materials for families to utilize at home. Thank you again for all your amazing support and resources during such a difficult time. We love KCM!"

#### -Jamie Regan, Bell Elementary School, Wayne County, KY



"Knowing the support provided through KDE, KCM and REL for this initiative, resulted in families having a front row seat in seeing their kids "light up" doing mathematics is extremely rewarding." - Maggie Doyle, KDE







Erin Th

Porter

"[KCM] supported teachers in Kentucky to plan and host events to spark excitement and support for math among families across the state. They were instrumental in transitioning the KFMN to a program that could be successful amid pandemic-related school closures and new barriers to reaching families."

-Kerry Friedman REL Appalachia

### Mathematics Teaching Practices Grant



In collaboration with the Kentucky Department of Education, University of Kentucky and Kentucky Valley Educational Cooperative.

This project focuses on two core components:



The development of two complete online training modules, focused on providing a set of training resources for KY teachers to build capacity around strategies for delivering high quality mathematics instruction to students in grades 3-8.



Then, contract math consultants to deliver these online training modules over a 10 week period in a facilitated learning format to eligible KY teachers who apply through a KDE managed recruitment program.



"KCM is a center more educational organizations should seek out and partner with. Their highly skilled staff, creativity, commitment to excellence and high quality products delivered on time are unmatched."

-Mike Abell, University of Kentucky Grant Administrator



# 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. Teacher participant cohorts were chosen after a rigorous application and interview process and come from schools all across the state of Kentucky. The program spans many grade levels, with teachers from elementary through high school classrooms.



#SpiralUp

### **4** Areas of Vision:

### Equity Pedagogy Content Leadership



When we launched the Kentucky Mathematics Teacher Leaders initiative, we envisioned a passionate group of mathematics teacher leaders with a firm belief in bettering mathematics education for their classrooms, schools, districts, and the commonwealth of Kentucky. Our 90 mathematics teacher leaders, representing elementary, middle, and high school teachers, have the dedication and commitment to make our vision happen! Our mathematics teacher leaders use every opportunity to deepen their understanding of mathematics. Leading by example, they use the best mathematics practices to meet the needs of each and every students.

# KyMTL

From KyMTL's beginning, we worked with this group of teachers to set the tone, define our expectations and provide professional development sessions to meet the needs of our leaders. Our mathematics teacher leaders drafted growth goals for their schools and for their districts. They developed these goals and held a poster presentation session where the teacher leaders shared evidence documenting their personal or school-wide growth. Teacher leaders will continue to reflect on their impact over time.

"Our teacher leaders continued working hard to accomplish their goals even though there were a lot of obstacles along the way [with the pandemic]. We truly believe that we built a strong group of mathematics teacher leaders who are willing to do whatever it takes to enhance teaching and learning mathematics in their classrooms, schools and districts."

> -Dr. Funda Gonulates KCM Faculty Associate





# **Online Resources**

KCM added the Learning Mathematics through Representations (LMR) resources to our website and virtual versions of LMR fraction lessons. Additionally, mini-sessions were offered utilizing Desmos, JamBoard and number talks.



"Many of the resources were created in collaboration with teachers or were prompted by a discussion with a teacher looking for a way to adapt their normal in-person instruction." -Dr. Cindy Aossey, KCM Regional Consultant

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 search by standard, grade level, fluency benchmark, task group or setting. In 2020-21, a total of **152** virtual resources were created to support KY teachers.

#### **KCM Online Resources Available:**

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

# Conference

"The KCM conference is the best PD I have ever had in my 26 years of teaching!"

The 2021 KCM conference - Imagine: **Building New Realities through** Collaboration - was held virtually March 7-10. The virtual platform enabled a much wider audience, with educators from around the globe participating in sessions. The conference saw 499 live session attendees, with another 177 viewing recorded sessions.



### KCM welcomed keynotes from:



#### JOHN SANGIOVANNI

"Making Number Sense a Reality" guided participants in dynamic and doable activities that promised to engage students in meaningful ways.



#### CHRIS LUZNIAK

Author of "Let's Debate Math: Increasing Discourse & Argumentation." This session focused on ways to help teachers develop routines that increase discourses in the math classroom.



#### NATASHA GERSTENSCHLAGER

"Improving Our Practice as Mathematics Teacher Leaders" explored findings from research to help build a new reality for becoming the best math teacher leader.



#### SUNIL SINGH

"Anti-Racist Math Education: Adding Our Historical Jewels" asked how situating standard concepts in historical narrative invites more interest and curiosity.



#### **KANITA DUCLOUX**

"Creating and Maintaining Equitable Structures in Mathematics" focused on the meaning of equitable structures and how math educators can create and maintain them.

# Research

### **Teacher-Level Influence of PLE**

#### The PLE was useful in:

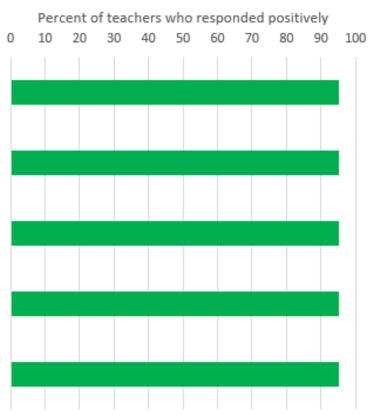
increasing my knowledge of mathematical content.

improving my ability to use mathematical models to describe real-world situations.

improving my ability to provide differentiated instruction to better meet the needs of students.

improving my ability to identify and utilize problem solving tasks that are accessible to all through multiple entry points and varied solution strategies.

> improving my ability to make connections among mathematical representations to deepen students' understanding of concepts and procedures.



### **Mathematics Beliefs Survey**

Children should understand computational procedures before they master them.

**23.5** %

Increase from pre- to post-survey Math should be presented to children in ways they can discover relationships for themselves.

100%

**Responded positively** 

Instruction goals are best achieved when students find their own methods for solving problems.



Increase from pre- to post-survey

Data from KCM courses was independently analyzed by the Burkhardt Consulting Center at Northern Kentucky University.

# Budget

### **SOURCE OF FUNDS**

State General Funds	\$1,352,752
Generated Revenue	\$196,000
Total	\$1,548,752

### **USE OF FUNDS**

Teacher Professional Development- State	\$932,000
Teacher Professional Development Services	\$652,000
Teacher Resources	\$280,000
Salaries/Wages	\$216,000
Benefits	\$205,000
Operating Expenses	\$118,000
KCM Conference (avg 600 teachers/year)	\$10,000
Office Expenses	\$108,000
Total	\$1,471,000
Total Carryforward as of June 30, 2021	\$1,340,592





### Contact

#### **Kentucky Center for Mathematics**

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