



# 2020 ANNUAL REPORT

**KCM**  
KENTUCKY CENTER  
FOR MATHEMATICS





# STENZ CON

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# A YEAR IN REVIEW

This annual report contains highlights of the Kentucky Center for Mathematics' statewide work from July 1, 2019 to June 30, 2020.

## WHO WE ARE

### MISSION

The mission of the KCM 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





# 2019-2020 HIGHLIGHTS

933

## UNIQUE PARTICIPANTS

attended KCM professional learning  
experiences

59

## PROFESSIONAL LEARNING EXPERIENCES

were held throughout the state

76

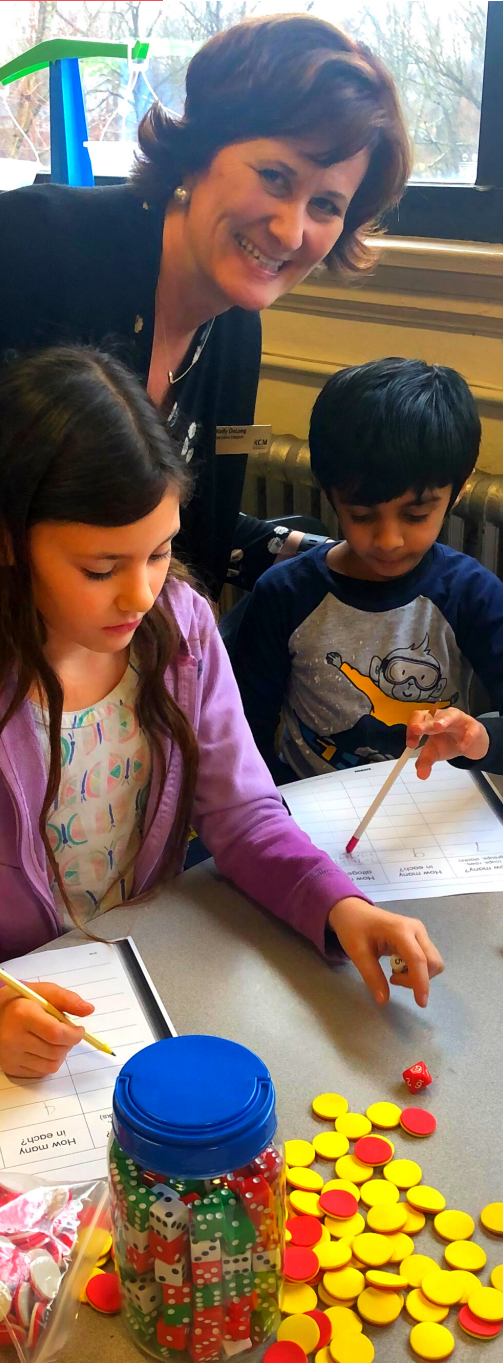
## COUNTIES

were represented from all across the  
Commonwealth



# LETTER FROM THE EXECUTIVE DIRECTOR

## Kelly DeLong



Dear Kentucky Mathematics Education Stakeholders,

**INNOVATION.** That single word sums up Kentucky Center for Mathematics programming in the time of virtual everything.

- In mathematics teacher professional development
- In school support for sustaining a positive mathematics culture
- In material creation for students to gain the mathematical skills needed for success

At the KCM, we work with Kentucky educators in creating a schoolwide culture that engages and guides students in making sense of mathematics. As we seamlessly transitioned to a fully virtual world in the spring of 2020, KCM relied on our intuition and relationships with Kentucky educators to guide the way.

How do you find the needs of Kentucky educators to ensure continued success in the mathematics classroom? Well, you ask them what they need and then craft programming to exceed expectations. That is exactly what KCM did! Mathematics teachers needed a community of professional learning to help navigate this unprecedented time. KCM provided daily 30 minute virtual professional development which focused solely on research-based mathematics content, pedagogy and resources. This time was a respite for weary teachers. A time to gather with like-minded mathematics educators to escape and talk about our shared passion for teaching students essential mathematics skills. The result was a community of folk from Kentucky, and across the nation, who relied on the KCM for a safe space to escape the realities of a global pandemic.

The story illustrates the very essence of the Kentucky Center for Mathematics. We are an organization who passionately supports our Kentucky educators. In the 2019-2020 budget, we increased spending on resources for teachers by 33%! There are more hands-on manipulatives in Kentucky classrooms than ever before. That trend will continue for the current budget year, as the need for individual math manipulatives is greater than ever. To continue focusing on supporting our KY stakeholders, KCM has diversified our programming to include district support for schools. Together, KCM and local school districts craft a customized plan to support positive mathematics culture, pedagogy and increased content knowledge for teachers. The result is a collaboration which puts student success as the focus of the work. All these innovations are a direct result of KCM's visionary spirit and unwavering support for KY educators.

The Kentucky Center for Mathematics has risen to the occasion during a global pandemic. Innovation has been our driving force. I revel in what the upcoming year will hold for KCM. I dare say look for amazing educator support and innovation!

*Kelly DeLong*  
Executive Director  
Kentucky Center for Mathematics

# ELEMENTARY

## **SEAL FOR KINDERGARTEN**

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The Stages of Early Arithmetical Learning (SEAL) identified the different ways young children make sense of quantity, addition and subtraction. During this session, participants dug in deeply to the Kindergarten Standards and how the SEAL can support teachers in helping students meet those standards.

## **COMPREHENSIVE COURSE FOR PRIMARY GRADES K-2**

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This eight-day learning opportunity was geared toward classroom, special education and mathematics intervention teachers of students in grades K-2. Participants engaged in varied instructional strategies and acquired tools to assess, support and advance students' mathematical reasoning and knowledge. Topics included counting and cardinality, number and operations, early algebraic reasoning, conceptual place value, measurement and data, and math/literature connections.

## **FOUNDATIONS FOR PRIMARY 2ND & 3RD GRADES**

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This course helped second and third grade teachers grow their understanding of effective ways to scaffold and differentiate instruction to better accommodate student needs via a learning climate that welcomes questions, opinions and participation of all students. There was a focus on helping students conceptually understand place value, addition/subtraction, multiplication/division and fractions.



# Elementary



## FOUNDATIONS FOR INTERMEDIATE (3-5)

This four-day professional learning event was attended by third, fourth and fifth grade teachers. It is aligned to research-based teaching practices and KAS; topics included number, place value, operations (addition, subtraction, multiplication, and division) and early algebraic reasoning.

**“I loved the program!  
I am a better math  
teacher for  
attending.”**





## EXPLORATIONS IN MATH ROUTINES & NUMBER TALKS FOR INTERMEDIATE GRADES 3-5

This course provided an opportunity for classroom teachers of students in grades 3-5 to learn strategies and acquire tools to advance students' mathematical reasoning. Topics covered included addition, subtraction and place value; the use of instructional routines including number talks; and the use of manipulatives, visual models and number lines.

## EXPLORATIONS IN 3RD GRADE MULTIPLICATION AND DIVISION

The first critical area of focus for third grade is developing understanding of and strategies for multiplication and division within 100. During this session, teachers explored contexts and tasks designed to support students in their journey toward multiplicative fluency within 100.

## EXPLORATIONS IN 4TH & 5TH GRADE MULTIPLICATION AND DIVISION

Multiplicative reasoning in grades 4 & 5 builds on strategies and understandings developed in third grade. Number talks and problem strings were used by teachers who explored opportunities to develop relational reasoning, a deeper understanding of the distributive and commutative properties and extend these understandings to work with multi-digit and rational numbers.



# ELEMENTARY

## EXPLORATIONS IN 3RD GRADE FRACTIONS

In this session, teachers explored hands-on activities designed to support students in developing conceptual understandings of fractions as numbers. Teachers deepened their understanding of fraction standards, seeing them as part of a progression.



**“THIS PROGRAM NEEDS TO REACH EVERY NOOK AND CRANNY OF OUR STATE. STUDENTS WOULD BE MUCH MORE SUCCESSFUL IF THEY RECEIVED THE TYPE OF INSTRUCTION KCM PROMOTES.”**

## EXPLORATIONS IN FRACTIONS AND RATIOS (GRADES 4-6)

Proportional reasoning, developing conceptual understanding of fractions and effective student support was explored by teachers through an online, year-long book study.

## EXPLORATIONS IN 4TH AND 5TH GRADE FRACTIONS

During this two-day session, teachers explored instructional strategies such as the use of manipulatives, fraction models (including number lines) and rich tasks to assist students in developing an understanding of fractions as numbers.

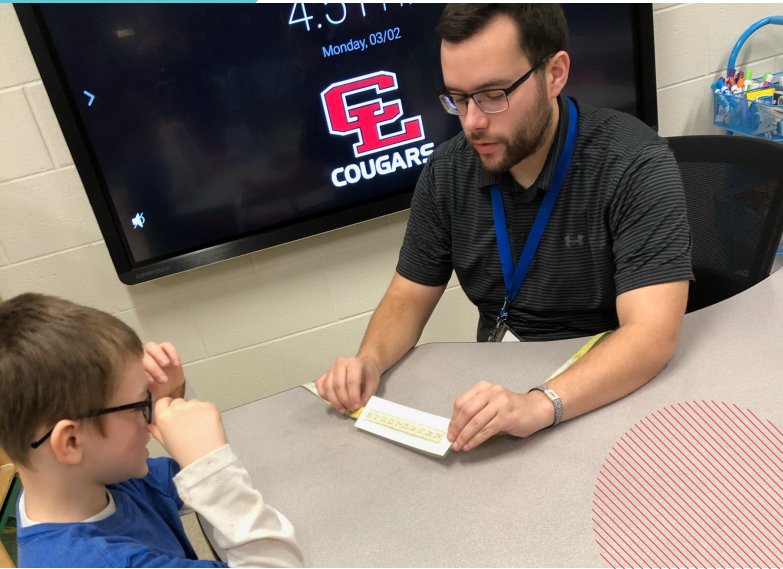




# Intervention

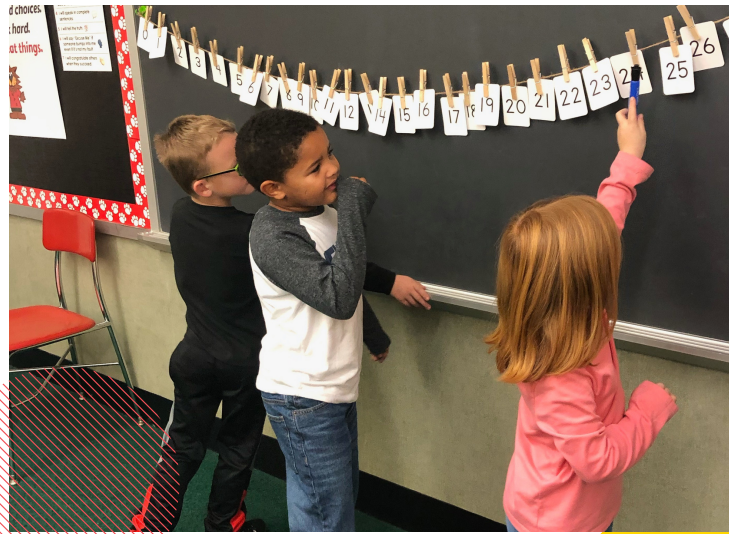
## MRIS (MATH RECOVERY INTERVENTION SPECIALIST) COURSE

MRIS is the KCM's most rigorous learning experience. This course was attended by elementary grade teachers who deliver intensive mathematics intervention and help 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 numeracy, based on the Learning Framework in Network.



## KNPI (KENTUCKY NUMERACY PROJECT INTENSIVE) COURSE

This ten-day course was built around Add+Vantage Math Recovery and was designed for elementary grade teachers to learn and practice assessments and teaching strategies for advancing students' foundational number knowledge, including addition, subtraction, multiplication and division.



## AVMR (ADD+VANTAGE MATH RECOVERY®)- DATA & INSTRUCTION (AVMR/KNPI GRADUATES)

This session focused on using AVMR data to design lessons that are appropriate, purposeful and targeted for maximum student growth. Teachers who completed AVMR or KNPI participated in this course.





# Mathematics Achievement Fund



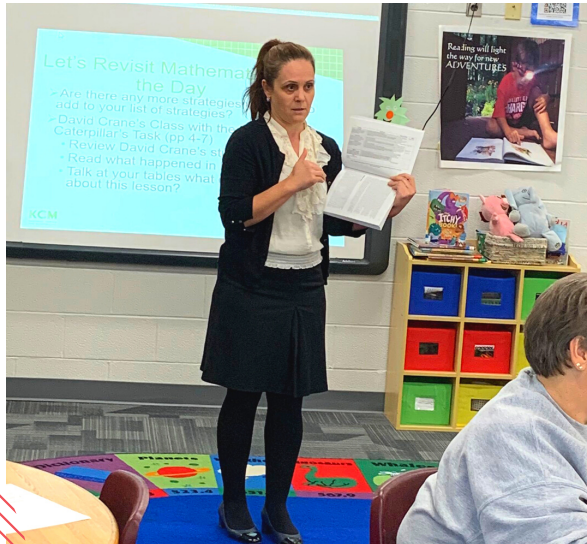
## MAF

KCM supports the work of the KDE through MAF-focused professional learning opportunities, school visits and teacher assistance. Schools have access to learning sessions and intervention services for primary students through the MAF grant.



**"Building relationships is always important but this experience also builds understanding- Directly relates to how I can coach teachers to implement problem solving tasks and skills."**

# Coaching



## Explorations in Creating School-wide Cultures of Sense-Making

This professional learning experience provided an opportunity to share thoughts, experiences and ideas with other educators while experiencing a schoolwide culture of learning. It included the opportunity to observe students as active learners in problem-centered mathematics lessons.

**"I THINK THAT IT IS IMPORTANT FOR US EDUCATORS TO LEARN FROM ONE ANOTHER AND THIS COURSE ALLOWED US TO HAVE THAT OPPORTUNITY PLUS MORE!"**

Over the course of two sessions, participants got to observe and participate in discussions of how a coach and teacher co-planned a problem-centered lesson intended to help students make sense of math concepts and then observe a class of students as active learners in that lesson live. Participants then took components of this process back to their schools in order to design a problem-centered lesson in their classrooms.





# KDE/KCM Collaboration



## STANDARDS MODULES

Under the leadership of KCM Director Dee Crescitelli, in partnership with the Kentucky Department of Education, KCM created three sets of modules for teachers with the goal of examining the Kentucky Academic Standards for Mathematics and highlighting the coherence and connections between standards and concepts.

Sixty teachers participated in a year-long series of meetings to pilot the sessions and provide valuable experience and feedback from classrooms all over the Commonwealth.

Guided by the research knowledge of Northern Kentucky University mathematics experts, Dr. Funda Gonulates, Dr. Bethany Nobblitt and Dr. Ted Hodgson, each of the finished sets of modules have 10 sessions for teacher leaders to use in providing professional development for groups of teachers:

- Explorations in Number Sense and Operations for Grades P-1
- Connections Between 5th Grade Measurement/Data & 6th Grade Proportions/Statistics
- Transition from Middle Grades Ratios & Proportions to High School Algebra & Geometry



# STRATEGIC PLAN

## *Moving Forward: A Two Year Vision*

New Executive Director Kelly DeLong brought a fresh start to the KCM, crafting a revamped strategic plan for the center. KCM internal staff, along with stakeholders from across the state, came together for three strategic planning workshops to focus the center's mission, scaling initiatives and innovation ideas. These workshops began ran from August to November of 2019.

KCM staff and stakeholders thought collaboratively to craft priorities for KCM time, effort and resource allocation. Dedication to supporting teachers with research-based strategies and designing instruction is what drives the KCM. The center seeks to provide professional learning experiences tailored to intervention and grade level specific topics. It is of high importance that the KCM provides its community of educators with free and easily accessible online resources and opportunities for math education outside of the classroom, like family math nights. The center also values being a liaison of educational centers from all across the state to strengthen the network of educational resources and collaboration.



## Defining Our Mission

# STRATEGIC PLAN

## *Moving Forward: A Two Year Vision*

In thinking about the KCM's strongest work, the strategic planning group brainstormed a plan to scale initiatives that would best benefit mathematics education in the state of Kentucky. One such area was scaling teacher leader work, to be more inclusive of all geographic areas throughout Kentucky, as well as expanding the content areas of focus. The center also seeks to enhance data collection and analysis and strengthen connections with post-secondary institutions. Expanding course offerings to include more middle and high school learning experiences is another way the center plans to scale its work.

In a step beyond scaling, the KCM is also looking at the horizon for new opportunities that will strengthen Kentucky mathematics education. The center plans to coordinate a teacher mentoring program while creating new teacher circles for peer support and collaboration. Additionally, the KCM will work with experienced teachers to help out other schools who are struggling in certain areas. To further assist struggling schools, the KCM will provide school support services and administration development. The center also finds it important to provide training to teachers who work with ELL students (students who are not native English speakers).



**Innovation**



# KyMTL

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. The first cohort of 92 teacher participants were chosen after a rigorous application and interview process and come from schools all across Kentucky, representing 50 different districts throughout the state. The program spans many grade levels, with teachers from elementary through high school classrooms.

This mathematics teacher leadership academy will feature year-long professional development for select classroom teachers throughout the Commonwealth. These mathematics teachers will "spiral up" as leaders by collaborating with like-minded educators from across the state to hone and expand their skills in educational leadership, mathematics content, pedagogy and equity.

Under the direction of the KCM, KyMTL's will become true leaders and agents of change in their schools and districts, across Kentucky and in numerous nationwide initiatives. These leaders will realize their full potential and learn more about best practices in teaching mathematics from national experts.

**"I LOOK FORWARD  
TO SHARING MY  
PASSION FOR  
MATHEMATICS AND  
LEARNING NEW  
WAYS TO INCREASE  
STUDENT  
ACHIEVEMENT!"**

-CLINTON COUNTY KYMTL  
COURTNEY NORRIS





# MIDDLE SCHOOL

## Mathematics Leadership Development for 5th & 6th Grade Teachers

The two-day summer institute and virtual follow-up sessions helped leaders establish productive group norms for ongoing teacher learning. Throughout the experience, participants built a repertoire of strategies and facilitation techniques as well as deepened their own understanding of Mathematics Knowledge for Teaching.

## Explorations in Reasoning Routines for 6th and 7th Grade

This course was designed to allow teachers to learn strategies to advance students' mathematical reasoning. Participants received repeatable designs for learning that support both teachers and students in the classroom.

## Foundations for Middle: Grade 8

This four-day experience was offered in two-day sessions where participants gained a greater understanding of how to support students in developing algebraic and functional reasoning.



"There were so many "Aha" moments! I have so many things to do with my students to get them understanding math and building number sense."

# HIGH SCHOOL

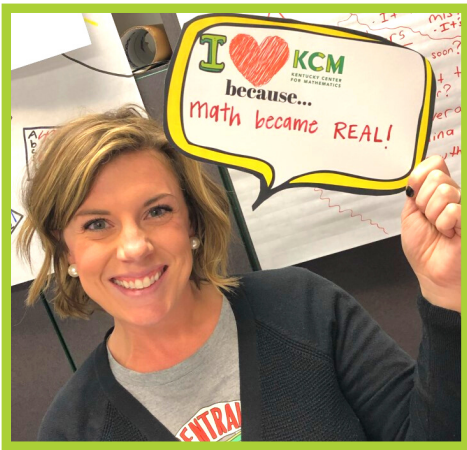


## MATHEMATICS LEADERSHIP DEVELOPMENT FOR 7TH, 8TH, 9TH & 10TH GRADE TEACHERS

The two-day summer institute and virtual follow-up sessions helped leaders establish productive group norms for ongoing teacher learning. Throughout the experience, participants built a repertoire of strategies and facilitation techniques as well as deepened their own understanding of Mathematics Knowledge for Teaching. Participating teacher leaders received support from the KCM to facilitate school-based professional learning experiences utilizing the KCM-developed Transition from Middle Grades Ratios and Proportions to Algebra and Geometry.

"I have learned a lot about how to create problem solvers. The materials and content we received throughout the course have impacted my practice and allowed my students to grow as excellent mathematicians."





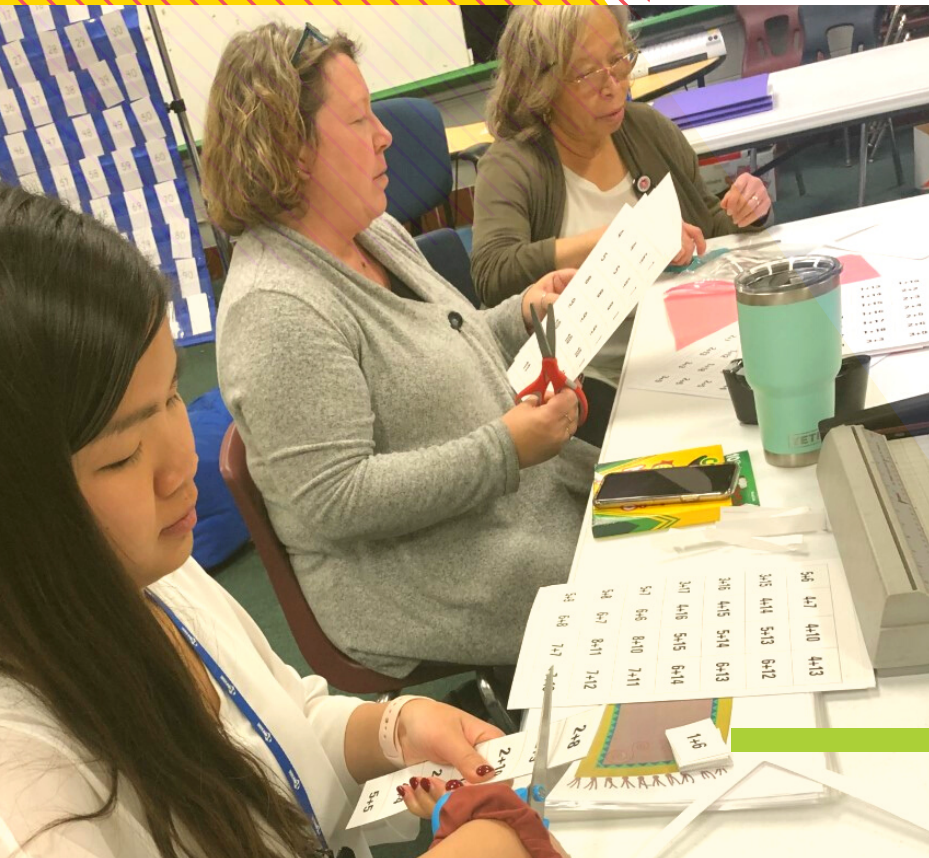
## KCM in the Community

The KCM is dedicated to working with schools and districts throughout the state to ensure that they have the tools and resources needed to provide students with innovative mathematics education.

One way we strive to reach this goal is through providing customized professional development, tailored to the specific needs of schools and districts. At Grayson County Schools, elementary teachers received custom designed fraction professional learning.

Caneyville Elementary School and Owensboro Public Schools received customized administration support with school visit planning. "I enjoyed working with PLCs reviewing KAS standards and curriculum!" -Leah Dix White, KCM Regional Consultant.

At Covington Independent Public Schools, the KCM worked to provide curriculum alignment and vertical planning in Ninth District Elementary School. "KCM provided me with tons of ready to go resources just when I needed them most!" -Paula Baldwin, 4th grade teacher.



# DISTRICT SUPPORT

# ADULT EDUCATION

KCM partnered with Kentucky Education Television (KET) in aligning their FastForward and Workforce Essential programs with the Kentucky Academic Standards for Mathematics. This collaboration enabled KET to release the modules to Kentucky educators as support for non-traditional instruction (NTI) days while highlighting connections between middle and high school mathematics and workforce development.



## Collaboration with KY Education Television





# 2020 KCM ANNUAL CONFERENCE

## **Illuminate: Gathering Evidence to Assess Mathematical Thinking**

The 2020 Conference brought forth a theme of social justice within mathematics education. The KCM was thrilled to welcome six nationally recognized mathematics education experts: Francis Su, Christopher Childs, Megan Franke, Marian Dingle, Robert Kaplinsky and Thomasenia Adams. These outstanding presenters led that event as teachers from across Kentucky enjoyed two full days of professional development. A post-conference day was also offered to select participants, welcoming guest speaker Kaneka Turner.



"It has proved valuable to my growth as a mathematics educator, and I always return to school feeling empowered and ready to illuminate!"





# 2020 KCM ANNUAL CONFERENCE

21

The 2020 KCM conference was held March 9-10, with post-conference day on the 11th, just prior to the global pandemic that halted large gatherings. KCM was so thankful for the opportunity to come together as a community before social distancing became the new normal. Who knew hand sanitizer would be so important in the months to follow?



"This is the best math conference I attend!"





The KCM has developed an arrangement of online resources and websites for continued support of participating educators. These online resources, which include assessments and research-based activities are available in a database that can be search by standard, grade level, fluency benchmark, task group or setting.

## ONLINE RESOURCES



@KyCenterforMath



@kycenterformath



@KyMath



### ***KY Family Math***

Family Math, the newest addition to KNP, contains activities for families based on popular exercises from the Intervention Guide. The Family Math website features online games for students and resources for parents.



### ***Resources for Virtual Instruction***

Materials that go beyond a virtual tool, featuring specific tasks for teachers to use.



### ***KCM Virtual Professional Development***

Online mini-courses, designed for classroom teachers. Educators can join live Zoom sessions or catch a recorded session later.



### ***Kentucky Numeracy Project Intervention Guide***

KCM developed repository housing activities designed for mathematics intervention teachers, but useable by any teacher, to support math instruction.  
(UN: bluegrass PW: math)



### ***KCM Fluency Assessments***

Upon receiving the appropriate training, teachers can utilize fluency assessments. These tests assess student learning of addition, subtraction, multiplication, division and fractions. Graphs and tables are created to chart the student's learning progression.



### ***Math Fact Fluency***

A companion website for the book *Math Fact Fluency*, created under the direction of co-author Dr. Jennifer Bay-Williams. Contents of the book are used to create vibrant, ready-to-use games that have teacher and student friendly instructions.

# VIRTUAL PROFESSIONAL DEVELOPMENT

KCM VIRTUAL COURSE PARTICIPANTS:

61

Different KY Counties

25

US States and Scotland

1,083

Educators Participated

49

Online Courses

## Responding to the Needs of Our Community

The KCM worked diligently to provide teachers with free, quality professional development and resources that they could access from home. Daily virtual math sessions were a respite for Kentucky teachers, the nation and the world. The cohort of teachers grew in their professional learning and found a community to bond with during the early stages of an ensuing global pandemic.

Elementary: Make 'n Take Supporting Number Sense and Fluency

Middle: Fractions, Decimals & Percents

High: Algebra, Geometry & Statistics

Math Intervention Expert Talks

Focus on Place Value

KCM Favorites: Books We Know and Love

Developing Multiplicative Thinking

Focus on Fractions

Focus on Geometry

More Multiplicative Thinking



## KCM Virtual Book Studies with Author Visits

Three virtual book studies were held with guest appearances by authors. Participants were able to ask questions and engage with experts in the field of math education.

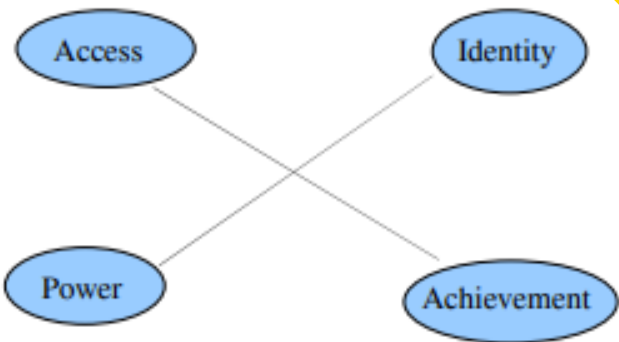
- o *Making Number Talks Matter* with authors Cathy Humphreys and Ruth E. Parker
- o *Developing Number Knowledge* with author Pamela Tabor
- o *Math Fact Fluency* with author Jennifer Bay-Williams





# EQUITY

## Dimensions of Equity



## PROJECT TEN MATH – Teachers Equitable Noticing (TEN) in Mathematics

Project TEN Math was developed by University of Kentucky Associate Professor and KCM Faculty Associate, Dr. Jonathan Thomas. This project is aimed at developing in-service teachers' capacity to enact equitable and responsive instruction in the mathematics classroom. Via a series of microlearning modules and created in conjunction with a project funded by the National Science Foundation, Project TEN Math will provide contexts and activities for the teachers as they integrate the dimensions of equity into their classroom practice. The result is classrooms where the diverse experiences of K-5 students may be explored more thoughtfully to create enriching and inclusive mathematical opportunities.

# KY FAMILY MATH NIGHT



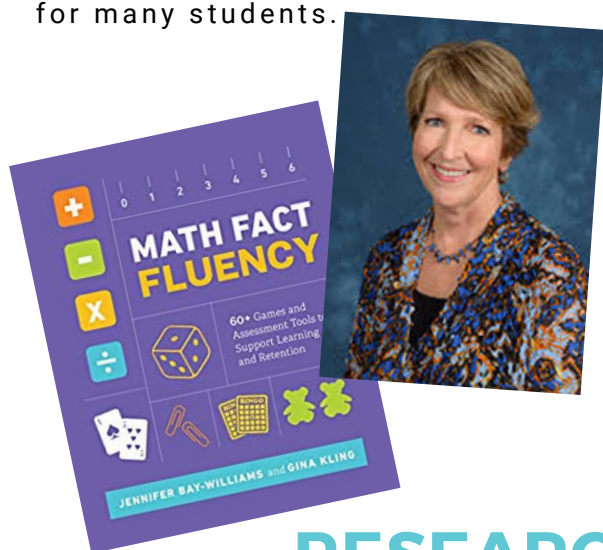
During the 2019-2020 school year, the Kentucky Center for Mathematics partnered with the Kentucky Department of Education, Regional Educational Laboratory Appalachia and Prichard Committee to support these efforts. Mathematics Achievement Fund (MAF) schools were selected by the Kentucky Center for Mathematics for the KY Family Math Night Initiative. The awarded schools received funding for the Mathematics Intervention Teacher (MIT) attendance at professional learning, school access to materials aligned to the newly revised Kentucky Academic Standards for Mathematics and stipends were provided to teachers who implemented KY Family Math Night.



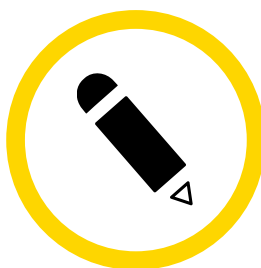
# MATH EDUCATION RESEARCH

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. This work was in direct response to many teachers from the KCM community indicating that fluency was an area of need for many students.

"Of one thing I am sure – the traditional approach to basic facts (rote drill and memorization) doesn't work," says Dr. Jennifer Bay-Williams. "Students don't remember their facts in the long run, and they then decide (1) they aren't good at math, (2) they don't like math or (3) both. I wrote *Math Fact Fluency* to offer teachers better options. So, to KCM, I am grateful for getting the book and the ideas disseminated throughout Kentucky."

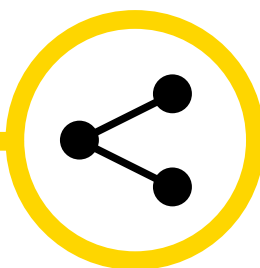


## RESEARCH TO ACTION



### RESEARCH

Cutting edge mathematics education research



### SHARE

Disseminated to KY teachers through KCM courses and resources

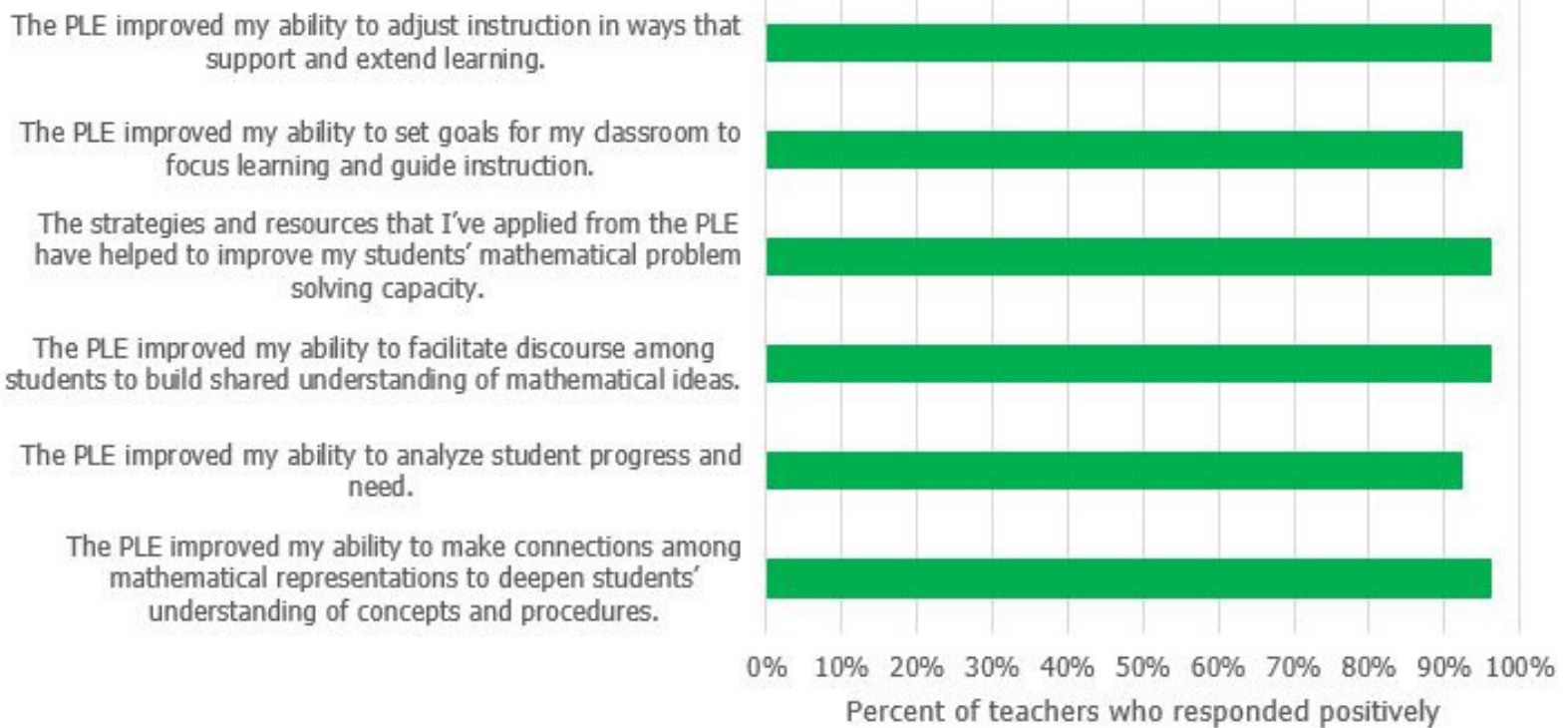


### SCALE

Research is scaled across the state of Kentucky

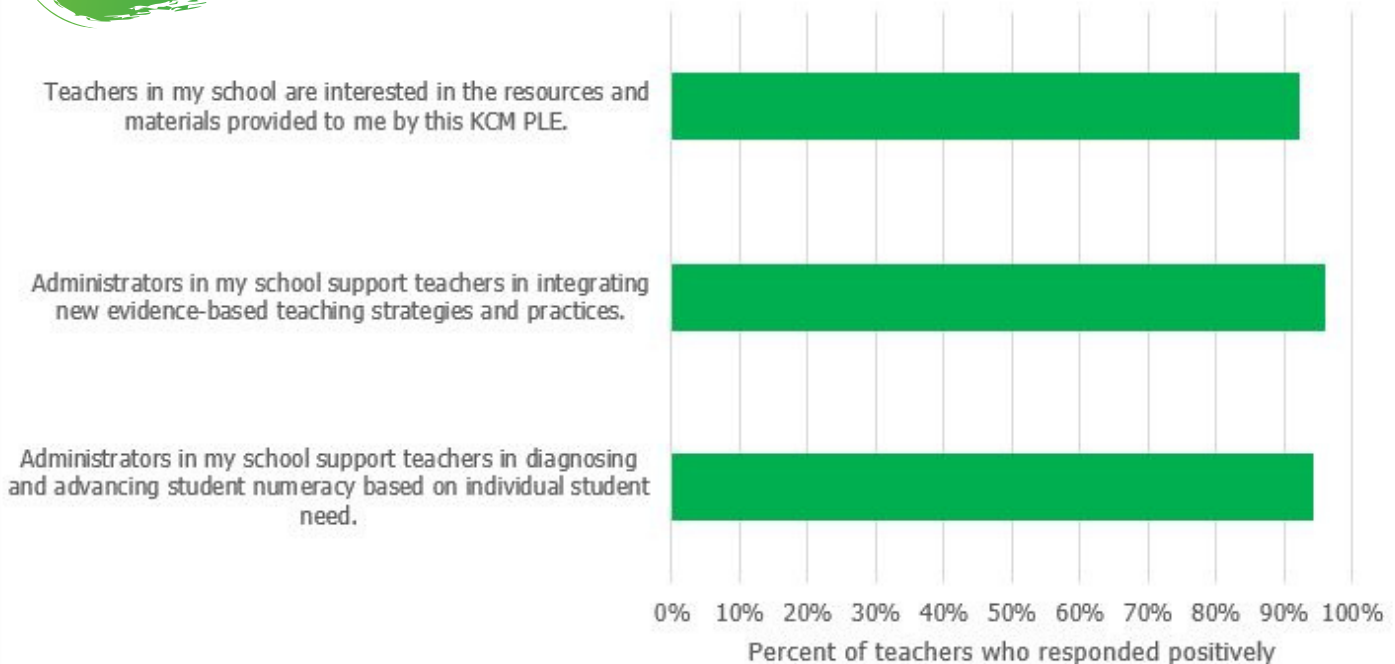
# RESEARCH

## Teacher-Level Influence of PLE



**“This has been one of the most beneficial professional developments I have ever completed. It has reshaped the way I think about and teach math.”**

## School-Level Influence of PLE





# BUDGET

## FY 2020

### Category

### Budget Used

#### *Source of Funds*

State General Funds	\$1,376,000
Generated Revenue	\$315,000
Total Sources of Funds	\$1,691,000

#### *Use of Funds*

Teacher PD- State	\$832,000
Professional Development Services	\$632,000
Teacher Resources	\$200,000
Salaries/Wages	\$242,000
Benefits	\$218,000
Operating Expenses	\$183,000
KCM Conference (avg 600 teachers/yr)	\$103,000
Office Expenses	\$80,000

#### *Total Use of Funds*

**\$1,475,000**







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