

ANNUAL REPORT 2017

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VISION, MISSION, AND GOALS

The KCM (Kentucky Center for Mathematics), established by the Kentucky General Assembly in 2006, supports diverse teacher and student populations across the commonwealth. The vision of the KCM is a world in which everyone is mathematically enlightened and empowered.

This annual report contains highlights of the KCM's statewide work from July 1, 2016 to June 30, 2017. The mission of the KCM is to advance the knowledge and practice of effective mathematics teaching and learning, encompassing early childhood through adult education. We provide and develop statewide leadership, facilitate professional learning

experiences, and cultivate innovation with the goal of improving mathematics education, practice, and policy. We promote environments which engage learners, to allow them to make sense of mathematics. We are grounded in research, centered on practice and focused on learners.

24,284



Unique Participants

129,541 webpage views



KCM 2016-2017 HIGHLIGHTS

KCM-developed activities accessed from Pinterest

30,338 participant hours

In KCM - provided PLEs



Fluency Assessments Administered



PLE Hours

www.kymath.org

LETTER FROM THE KCM EXECUTIVE DIRECTOR

Dear Kentucky Math Education Stakeholders,

The past year has been a particularly exciting one for the Kentucky Center for Mathematics. With support from many stakeholders who are invested in improving mathematics teaching and learning in Kentucky, we began laying the foundation for a new coherence model for professional learning. This model is designed to ultimately impact P-20 mathematics education throughout the commonwealth. Our experiences and research have taught us that:

- A coherent mathematics experience based on sense-making, problem solving, and student-centered pedagogy is important for all students. KCM data shows that coherent mathematical learning experiences across grade levels are particularly impactful for students that struggle in mathematics.
- Both proficiency growth rates and novice reduction rates are higher at schools where teachers exhibit • effective application of the Mathematics Teaching Practices (MTPs) which are promoted by KCM professional learning experiences.
- Schools that have multiple teachers across grade levels who have participated in professional learning experiences from the KCM demonstrate significantly greater growth in proficiency rates when compared to state averages.

As a result of our experiences and research, the KCM has developed a vision for how we can structure our professional learning experiences to have a greater impact on the coherence of the mathematics education experiences of students in a school. The KCM Coherence Model is focused on the transformation of teacher practices and beliefs across multiple grade levels. We believe Kentucky children can receive a coherent mathematics education experience where:

- All P-12 mathematics education experiences are characterized by a culture of sense-making and student engagement;
- Teachers in earlier grades use their grade level mathematics content as a platform for developing the skills that are needed for success in later grades;
- Teachers in later grades reinforce and build upon skills developed in earlier grades; and
- Students receiving extra help via intervention or extra sessions outside of class find the extra help pertinent and impactful to their understanding of content.

Our collaborations with the Kentucky Department of Education, the Council on Postsecondary Education, Kentucky postsecondary institutions, Kentucky Adult Education, other education centers and school districts throughout the commonwealth are dedicated to assuring coherence (i) when students are transitioning from lower grades to higher grades both within and across schools; (ii) when students are making connections across STEM and other fields, (iii) when students are transitioning from P-12 to postsecondary institutions or to Kentucky Adult Education offerings, and (iv) when preservice teachers are transitioning from postsecondary preparation to classroom teaching. While there are many challenges, we at the KCM believe that a collective vision for high quality mathematics education across P-20 is emerging in Kentucky. We are both humbled and proud to work with teachers, administrators, and other mathematics education stakeholders in Kentucky to help realize this vision.

Sincerely,



Passion is contagious

KCM brings educators together to share knowledge, strategies and resources in a supportive environment, growing their expertise and passion for mathematics education.



3

David Mader

Empowered teachers lead to empowered students

KCM equips teachers to become confident decision-makers who employ research-based tools and strategies to improve student achievement in mathematics.





Advance knowledge

Research provides the building blocks for knowledge and values. KCM conducts and disseminates mathematics education research to strengthen the foundation of education practice and policy.



"This program was excellent! I have been able to return to my classroom and implement all of the lessons immediately. This is by far the best professional development I have ever participated in for teacher learning/understanding and implementation within the classroom...."

- Foundations for Early Childhood Participant

PRESCHOOL Foundations for Early Childhood Mathematics

Foundations for Early Childhood Mathematics professional learning experience featured content developed by the Erikson Early Math Collaborative at the Erikson Institute. Participants explored developmentally appropriate discussion and activity using high-impact, evidence-based strategies and children's literature to ignite their students' mathematical learning.

A new extension course for the KCM Foundations for Early Childhood Mathematics began in the 2016-2017 academic year. This extension was offered for all graduates and current participants of the KCM Foundations for Early Childhood Mathematics course. This professional learning experience explored topics including implementing the MTPs (Math Teaching Practices) in the early childhood classroom, professional noticing, as well as other content relevant to the development of the participants' instructional decision-making.

IN 2016-2017, 111 PARTICIPANTS ATTENDED FOUNDATIONS FOR EARLY CHILDHOOD

ELEMENTARY

Mathematics Achievement Fund

Effectiveness of the 2015-2016 through 2016-2017 MAF Cohort

In 2015-2016, the fourth distinct cohort of MAF (Mathematics Achievement Fund) schools began providing services to students. MAF schools in this cohort continued to receive the high quality professional learning and support that had always been provided to MAF schools. However, in response to what we had learned through experience and research, KCM began providing the following additional support:

- at least 3 school visits per year by a KCM Regional Consultant to promote the development of high quality teaching practice and facilitate growth of teacher capacity.
- one-day orientation to the MAF program emphasizing the importance of a schoolwide culture that embraces problem solving and student engagement.
- expanded KCM professional learning offerings to include more opportunities for classroom teachers.

The performance of this fourth cohort of MAF schools can be seen by monitoring the change in proficient and novice students schoolwide when looking at K-PREP (Kentucky Performance for Educational Progress) results from the year prior to the start of MAF support for this cohort (pre-MAF) to the conclusion of the final year of MAF support for this cohort (post-MAF).

Pre-MAF to Post-MAF Change in K-PREP Proficiency

PERCENTILE POINT IMPROVEMENT



Pre-MAF to Post-MAF Novice Reduction on K-PREP

PERCENTILE POINT REDUCTION

MAF School Average



KY State Average

Highlights from MAF 2016-2017

During 2016-2017, 113 participating schools received the necessary funding to support a primary grades (K-3) MIT (Mathematics Intervention Teacher), including the costs of salary, benefits, professional learning, travel, and materials. MITs participated in intensive in-person professional learning experiences, collegial team meetings, and online meetings.

Average MAP (Measures of Academic Progress) Percentile Point Gains of Struggling* MAF Intervention Students by Grade Level



*Struggling students are defined as MAF intervention students placing in the 25th percentile or below on the 2016-2017 fall MAP assessment.



Learning Provided by MITs



Students Provided with **Intensive Intervention Services**



ELEMENTARY

Foundations for Primary Grades Mathematics

Foundations for Primary Grades Mathematics is an introductory professional learning experience for K-3 teachers, allowing participants to work in professional learning communities and build upon their understanding of early numeracy development. The course also focuses on the skills used to establish students' fluency with addition and subtraction. This professional learning experience was led by an experienced math intervention teacher using evidence-based strategies, as well as materials for early numeracy development from experts in the field.

129 participants

attended the Foundations for Primary Grades sponsored by the KDE in 2016-2017

ELEMENTARY

Foundations for Primary Grades Summer Institute

In June 2017, a summer institute was held for Foundations for Primary Grades graduates. The two-day PLE featured Dr. Jo Boaler's innovative work on mathematical mindsets. Participants engaged with content focused on how educators can reduce math anxiety by encouraging students to turn mistakes and struggles into valuable learning experiences.

67 participants

attended the Foundations for Primary Grades Summer Institute sponsored by the KDE in 2016-2017



"FOUNDATIONS FOR PRIMARY GRADES HAS BEEN A WONDERFUL EXPERIENCE THAT HAS HAD POSITIVE EFFECTS ON MY STUDENTS."

ELEMENTARY

Comprehensive Course for Primary Grades Mathematics

The Comprehensive Course for Primary Grades Mathematics was offered for classroom, special education, and mathematics intervention teachers that work with students in grades K-2. Throughout the professional learning participants engaged in varied instructional strategies and acquired tools to assess, support, and advance students' mathematical reasoning and knowledge. Aligned to research-based teaching practices and KAS (Kentucky Academic

Standards), topics included counting and cardinality, number and operations, early algebraic reasoning, conceptual place value, measurement and data, and math/literature connections. Participants received books, activities and instructional materials, along with assessment strategies to identify and target student needs and misconceptions in early numeracy.



Comprehensive Course for Intermediate participants



ELEMENTARY Comprehensive Course for Intermediate Grades Mathematics

KCM Comprehensive Course for Intermediate Grades Mathematics provided participants who work in the classroom, special education, and intervention with students in grades 3-5 the opportunity to expand their knowledge about advancing their students' mathematical reasoning through strategies and tools. Aligned to research-based teaching practices

"This was one of the best PLEs I have participated in within the last 20 years. Every time we met I gained valuable information to help my students in learning math and with me teaching math. I feel I have a much better understanding of math and how best to teach kids. I look forward to sharing all the information and practices I have learned to anyone who will listen."

- Comprehensive Course for Primary Grades Participant

and KAS, topics included number and operations, place value, fractions and fractions operations, algebraic reasoning, and the use of KCM Fluency Assessments to identify student need. Participants received books, activities, and instructional materials in this 10-day course.

KCM ONLINE RESOURCES

Realizing the urgency to extend the KCM professional learning community and support participating teacher leaders, the KCM developed a system of online resources and websites. The KNP (Kentucky Numeracy Project) was created in 2012. The KNP features a collection of online resources including assessments and differentiated instructional activities. As of 2017, the KNPIG (Kentucky Numeracy Project Intervention Guide) featured a database of more than 500 research-informed activities that can be searched by standard, grade level, fluency benchmark, task group or setting.



FLUENCY ASSESSMENTS

145 teachers used tool 2,213 students assessed

9,266 assessments administered

FAMILY MATH

13

4,452

3,439

users

14,164

pageviews

ELEMENTARY

Foundations for Intermediate Grades

KCM Foundations for Intermediate Grades was an experimental professional learning held in Boyle County with 3rd – 5th grade teachers in the district. During this pilot session, participants explored ways to support students in developing a conceptual understanding of operations and place value through number talks and the use of manipulatives and visual models. Additionally, participants were challenged to use pattern blocks and Cuisenaire rods to develop students' understanding of fraction concepts including equivalent fractions, comparing fractions, composing and decomposing fractions, and fraction operations. Math balances were used to investigate equivalence, operations, and mathematical properties.

ELEMENTARY

Explorations in Third Grade Fractions

Third grade is a critical year in which students should develop strong foundations for understanding fractions. During the two Exploration in Third Grade Fractions sessions held in April 2017, teachers explored hands-on activities and tasks designed to support students in developing conceptual understanding of fractions as numbers. Teachers deepened their own depth of knowledge related to third grade fractions standards, seeing them as part of a progression starting in first grade and continuing into middle school. Participants received prepared materials and manipulatives sufficient for work with a small group, including fraction squares, Cuisenaire rods, and KNPIG activities.



COACHING

Mathematics Content Coaching

Partnering with the Kentucky Department of Education, the KCM once again offered Mathematics Content Coaching for elementary and middle grades instructional coaches and teacher leaders, as well as administrators. This unique professional learning experience occurred in schools using real teachers, real classrooms and, most importantly, real students. Participants observed a master coach as she publicly co-planned a lesson with a teacher. Then the participants were able to observe students in a live classroom as the master coach co-taught the mathematics lesson. The observed lessons were analyzed and critiqued by the groups. Participants in all of the cohorts engaged in deep thinking about effective teaching and learning with a lens focused strongly on student impact.

In 2016-2017, 109 total participants attended the KCM Mathematics Content Coaching professional learning. There were 78 elementary and middle grades participants and 31 administrator participants. "I LOVED THIS EXPERIENCE AS A COACH. IT HAS HELPED ME TO EXPLORE MATH AND SUPPORT TEACHERS IN ANALYZING STUDENT WORK AND REALLY FOCUS ON WHAT STUDENTS CAN DO INSTEAD OF WHAT WE CAN TEACH THEM. "

COACHING Master Coaching

With funding and support from the Kentucky Department of Education, the KCM was again able to offer a unique professional learning experience focused on the development and growth of mathematics instructional coaches. The goal of the Master Coaching program is to develop Kentucky's capacity for improving the teaching and learning of mathematics in grades K-8 through skillful instructional coaching.

In 2016-2017, two cohorts of KCM Master Coaches were formed: one elementary and one middle grades. Participants for each cohort were selected based on applications. The Master Coaching participants met throughout the school year, both in person and online. Additionally,



"The opportunity to network with other coaches from around the state has improved my abilities as a coach. The experience has been a vehicle of change in my school and helped me grow as a coach." - KCM Coaching Participant participants were required to document the work they undertook during the year with a teacher partner. Each of the cohorts was then required to present a conference session during the 2017 KCM Conference detailing lessons learned during their year-long learning experience.

In 2016-2017, 15 participants attended Master Coaching (8 elementary, 7 middle school). Four of the coaches served as leaders and were awarded the designation of KCM Master Coach. Eleven other coaches participated in the program and were awarded the designation of KCM Elite Coach.

"This experience allowed me to see the power of math content coaching to influence mind shifts in teacher beliefs around mathematics teaching and learning. I also commend the KCM and KDE collaboration that is striving to bring positive change to the culture of mathematics learning and teaching in Kentucky."

- KCM Coaching Participant



MIDDLE SCHOOL

Foundations 6 & 7

Through the partnership with the Kentucky Department of Education, the KCM was able to again offer a six-day professional learning experience targeting 6th and 7th grade teachers. The program provided materials and support to assist teachers in gaining a greater understanding of middle grade mathematics content and pedagogy. Participants explored how 6th and 7th grade students learn mathematics, evidence-based intervention strategies for use with students who are struggling, and resources and professional knowledge for identifying and analyzing student misconceptions.

On the fourth day of the professional learning, administrators were invited to attend as well. The goal of the administrator involvement was to equip not only the teachers, but the principals with the skills to help them bridge the gaps in mathematics achievement. Participants of these sessions used instructional strategies to improve critical thinking, problem solving, and

classroom discourse. Participants also analyzed student responses and interpreted evidence of student understanding and skills, made evidence-based instructional decisions for advancing students' abilities to fluently and flexibly deal with rational numbers. Resources such as ready-made activities, manipulatives, books, etc. were also provided.

63 participants

attended Foundations 6 & 7 in 2016-2017

"[Foundations 6 and 7] was a great program to help teachers gain perspective in how the student learns and understands new concepts, and helps us identify misconceptions."

- Foundations 6 and 7 Participant

MIDDLE SCHOOL

Foundations 8

"This was the best PD I have attended in 21 years. I had several "A-ha" moments in understanding the standards for mathematical practice...The time to build materials and collaborate with other teachers meant I have already implemented strategies learned into my classroom. This was invaluable."

The KCM was proud to collaborate with the Kentucky Department of Education to offer a new professional learning opportunity for the 2016-2017 academic year. KCM's Foundations 8 program provided 8th grade math teachers with a rich four-day professional learning experience. This PLE allowed middle school teachers to gain a greater understanding of how to support students in developing algebraic and functional reasoning. Participants of these sessions used instructional strategies to improve critical thinking, problem solving, and classroom discourse. They also explored





evidence-based intervention strategies that could be used to help struggling students. Foundations 8 participants received resources such as ready-made activities, manipulatives, books, etc.

58 participants

attended Foundations 8 in 2016-2017

MIDDLE SCHOOL

Middle Graduates

In 2016-2017, the KCM, with funding from the Kentucky Department of Education, offered two follow-up professional learning days for teachers who had previously attended a Foundations 6 & 7 PLE. These sessions for Middle Graduates provided

opportunities for teachers to further explore strategies for supporting students who struggle with 6th and 7th grade mathematics. Participants explored instructional strategies aimed at improving critical thinking, problem solving, and classroom discourse.

Middle Graduate participants also received resources such as ready-made activities, manipulatives, books, etc.

In 2016-2017, 60 participants attended Middle Graduates.



"[The KCM PLEs] that I have attended have helped me immensely in teaching math content to the students. I feel much more confident in teaching math and the manipulatives and strategies that we received are invaluable in teaching my lessons."

MIDDLE SCHOOL

Summer Institutes

In June 2017, the KCM, with support from the Kentucky Department of Education, offered two professional learning opportunities for middle school (6-8) educators. Both of these PLEs were designed to provide cross-district collaboration and professional growth among middle school math teachers.

Thinking Routines, Models and Discourse for Middle School Mathematics (6-8) was a one-day offering. During this PLE, participants explored how to orient instruction to develop a mathematics pedagogy which focuses on student understanding and explored instructional routines that support the development of critical thinking skills and reasoning.

Purposefully Designing a Thinking Culture in Middle School Math Classrooms was a two-day session that focused on helping teachers start the next school year with a specific plan for cultivating a classroom/school culture focused on mathematical habits of mind and the big ideas of middle school mathematics. Participants explored how to intentionally create learning environments where students can be pattern sniffers, experimenters, describers, tinkerers, inventors, visualizers, conjecturers, and guessers.

- Middle Graduates Participant

"THIS PLE HAS HELPED TO TRANSFORM MY PHILOSOPHY OF TEACHING AND WILL DEFINITELY AFFECT MY PEDAGOGICAL PRACTICE."

In 2016-2017, 95 participants attended the Middle School Summer Institutes.



HIGH SCHOOL Algebra 1 Lesson Study

Algebra is more than a collection of rules to memorize and steps to follow! With support from the Kentucky Department of Education, Northern Kentucky University and the Council on Postsecondary Education, the KCM provided a unique four-day, hands-on and minds-on professional learning experience that explored productive and exciting ways to address the teaching and learning of Algebra I. Participants, who were a combination of in-service and preservice teachers, met for two days in the fall and two days in the winter. The teachers collectively discussed enriching Algebra I tasks that would engage students in meaningful explorations of the content for a specific classroom. Then a master teacher taught lessons in those classrooms as other group members observed. Following the lessons, the group came back together to discuss their observations of the impact on student learning and ideas for

improvement. The focus was on developing lessons that allow students to engage in algebraic reasoning by recognizing and analyzing patterns, studying and representing relationships, making generalizations, and analyzing change.

AFTER 11 YEARS OF TEACHING, WHILE I KNOW AND ATTEMPT TO CONTINUALLY IMPROVE - I HAVE A CLEAR FOCUS ON "HOW" TO IMPROVE!



HIGH SCHOOL FLIP-EKY Project

The FLIP-EKY Project is a two-year IEQ (Improving Educator Quality) project, funded by the KY Council on Postsecondary Education and directed by a KCM Faculty Associate. In the project, participating teachers commit to using video podcasts to "flip" at least one unit in at least one mathematics classroom or science classroom. In a flipped classroom, video podcasts address course content and are viewed as homework, whereas classroom time is used to for discussion, enrichment, exploration, and activities that address the

ADULT EDUCATION

Math For Adult Educators

In 2016-2017, KCM partnered with KYAE (Kentucky Adult Education) to offer five one-day professional learning events targeting adult educators. M4AE (Mathematics for Adult Educators) provided Kentucky adult education teachers with opportunities to develop a greater understanding of mathematical teaching and learning strategies related to College and Career Ready Standards based on the Kentucky Academic Standards. Each one-day workshop revolved around a mathematical topic or idea with an emphasis on building conceptual learning. The sessions provided opportunities for adult Kentucky Academic Standards for Mathematics and Next Generation Science Standards.

In total, 44 mathematics and science teachers from eight eastern Kentucky school districts participated in the project.

44 participants

from eight eastern Kentucky school districts participated in the FLIP-EKY Project

educators to explore ways to address gaps in the mathematical understandings of their adult students. Participants experienced hands-on activities and explored ways to help their adult students make sense of mathematics through the use of multiple representations: symbols, drawings, situations (contexts), and manipulatives.

"Having only been in teaching for less than two years, this seminar gave me tools that will increase my confidence level."

- Math For Adult Educators Participant

POSTSECONDARY

Mathematical Teaching Clinical Horizons

In 2016-2017, KCM participated in year two of a pilot project exploring how to build and support clinical sites for preservice teachers. MaTCH (Mathematical Teaching Clinical Horizons) was a collaborative effort between KCM, the Council on Postsecondary Education, Northern Kentucky University and the Kentucky Department of Education. Two school districts were selected to serve as hosts for the clinical sites: Bellevue Independent and Ludlow Independent school districts.

For the second year, KCM provided unique professional learning experiences for in-service and preservice teachers which focused on how to approach grade-level standards in rigorous and engaging ways. During the professional learning events, KCM encouraged both the in-service and preservice teachers to explore the mathematical understandings of their students and to build upon those understandings through rich engaging lessons. Participants were provided with multiple professional learning opportunities, as well as, materials, printed resources, and collaborative time to plan how to use those materials within their classrooms.



"I am just starting in my teaching career and this was my first experience seeing an algebra class from the perspective of a teacher. The relationship between the amount of work the students do in the lesson compared to what the teacher should do is very different than I ever thought about before. We were seeing the students thinking and reasoning, instead of just having the teacher giving them the info."

- Preservice Teacher Participant

POSTSECONDARY **Project TECHNO**

Project TECHNO (Technology-Centered Mathematical Noticing) is developing technologically-centered learning modules for use in online teacher preparation contexts that will positively affect preservice teachers' capacity to attend to, interpret, and respond appropriately to children's mathematical thinking along learning trajectories in numeracy and early algebra. This type of responsive teaching, referred to as professional noticing, is considered a highly productive framework for guiding the work of mathematics teachers. This project was awarded nearly \$500,000 by the National Science Foundation in the summer of 2014 and in 2016-2017 the project entered its fourth year of operation.

PROJECT TECHNO AIMS TO ENHANCE PROFESSIONAL NOTICING CAPACITIES OF PRESERVICE ELEMENTARY TEACHERS TO EARLY ALGEBRAIC LEARNING AMONG LARGER GROUPS **OF STUDENTS.**

As part of the development of rich learning materials, project leaders throughout Kentucky coordinated with practicing classroom teachers to co-teach a series of innovative algebraic lessons which were video-recorded. These video recordings served as the basis for a second instructional module, E3A (Examining Essential Elements of Algebra). This module, along with the N3 module, is being implemented in traditional and online teacher preparation



\$500,000

awarded by the National Science Foundation in the summer of 2014

environments at public postsecondary institutions across the commonwealth. The research team is presently concluding data analysis. However, preliminary analyses suggest that these professional noticing modules will have a strong, positive impact on preservice teachers' capacity to teach responsively.

Results from this project have been presented at nine different sessions across multiple conferences, locally and internationally. One research article has been published with another recently accepted for publication. Additionally, members of this team published a book on the topic of noticing.

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KCM CONFERENCE

The KCM hosted its ninth annual conference on March 6 & 7, 2017 in Lexington, Kentucky. The theme of the conference, "Intentionality: Making Math Meaningful," encouraged attendees to interact with passionate and knowledgeable colleagues while also exploring tools and strategies for intentional mathematics teaching and learning. The conference theme was chosen based on the NCTM's (National Council of Teachers of Mathematics) landmark publication, *Principles to Actions: Ensuring Success for All.*

A record number of 603 educators attended the conference, preschool through postsecondary, representing 93 Kentucky school districts and six Kentucky postsecondary institutions. In addition, 92 breakout sessions were offered throughout the two-day event.

Teachers engaged in hands-on activities and shared ideas with standout mathematics educators from throughout the country. Featured speakers included Cynthia Bell (Literacy Assistance Center), Douglas Clements (University of Denver), Sherry Parrish (author), Kathy Richardson (Math Perspectives Teacher Development Center), Greg Tang (GregTangMath.com), and Pamela Weber Harris (The University of Texas at Austin). "The KCM conference is always motivating this time of year and inspires me to keep teaching better and stronger. I always gain knowledge... and resources to improve my math instruction."

- KCM Conference Attendee

603 educators

attended the 2017 KCM Conference



KCM LONGITUDINAL RESEARCH

Impact of the KCM Coherence Model on Struggling Students

Our innovative KCM Coherence Model, being implemented with MAF schools in 2017-2018, recognizes that coherence is particularly important with students that have fragile foundations in numeracy and less home support in mathematics. Our model promotes long-term coherence across grade levels and between classroom and pull-out intervention instruction. Part of this model's development was aided by the results of a research study on students from 2011-2012 through 2014-2015 at MAF schools. Our study first looked for indicators of coherence at these schools and then looked for the long-term impact of the MAF model on GAP students that, through a novice classification on K-PREP, were identified as struggling in mathematics.

Percent Reduction in Novices from 2011-2012 to 2014-2015 at MAF Schools



Coherence: In 2011-2012, MITs, administrators, and classroom teachers in MAF schools were asked to complete a survey reflecting on instructional practices in their building. Items on the survey included teachers' willingness to share and discuss student work with each other, the exchange of ideas on instructional methods, and collaborative teamwork. Participants reported strong agreement (89.4% average) across all of these indicators of coherence.

Effectiveness: The figure above shows the percent of 2011-2012 3rd grade novices in Kentucky that ceased to be novices by the time they completed 6th grade; organized by hours of MAF intervention and race. Among non-white 3rd grade novices in 2011-2012, the probability of ceasing to be a novice by 6th grade was two to four times greater among those that received MAF intervention services. For white novices in 2011-2012, the probability of ceasing to be a novice by the 6th grade was 33% to 66% greater among those that received MAF intervention services than those who did not receive MAF intervention services.

BUDGET FY 2017

	Expenditures
KCM Personnel Salary (Full-Time and Part-Time Staff)	\$351,411
KCM Personnel Fringe Benefits	\$294,570
Faculty (Executive Director, Faculty Associates, Faculty Support for Projects)	\$142,225
TOTAL STAFF & FACULTY	\$788,206
NKU Student Workers	\$71,356
Regional Consultants across the State of Kentucky	\$488,451
Other Contracted Personnel (Evaluators, Facilitators)	\$106,075
TOTAL OTHER PERSONNEL	\$665,882
SUBTOTAL PERSONNEL	\$1,454,088
Operating	\$204,815
TOTAL EXPENDITURES FY 2017	\$1,658,903
In addition to the above expenditures, the following external projects	Grant Funding
In addition to the above expenditures, the following external projects were entrusted to KCM:	Grant Funding Received
<i>In addition to the above expenditures, the following external projects were entrusted to KCM:</i> Kentucky Department of Education - Mathematics Content Coaching	Grant Funding Received \$64,752
In addition to the above expenditures, the following external projects were entrusted to KCM: Kentucky Department of Education - Mathematics Content Coaching Kentucky Department of Education - Mathematics Master Coaching	Grant Funding Received \$64,752 \$47,639
In addition to the above expenditures, the following external projects were entrusted to KCM: Kentucky Department of Education - Mathematics Content Coaching Kentucky Department of Education - Mathematics Master Coaching Kentucky Department of Education - Foundations for Early Childhood	Grant Funding Received \$64,752 \$47,639 \$57,896
In addition to the above expenditures, the following external projects were entrusted to KCM: Kentucky Department of Education - Mathematics Content Coaching Kentucky Department of Education - Mathematics Master Coaching Kentucky Department of Education - Foundations for Early Childhood Kentucky Department of Education - Foundations for Primary Grades	Grant Funding Received \$64,752 \$47,639 \$57,896 \$79,783
In addition to the above expenditures, the following external projects were entrusted to KCM: Kentucky Department of Education - Mathematics Content Coaching Kentucky Department of Education - Mathematics Master Coaching Kentucky Department of Education - Foundations for Early Childhood Kentucky Department of Education - Foundations for Primary Grades Kentucky Department of Education - Foundations for Middle Grades	Grant Funding Received \$64,752 \$47,639 \$57,896 \$79,783 \$152,245
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In addition to the above expenditures, the following external projects were entrusted to KCM: Kentucky Department of Education - Mathematics Content Coaching Kentucky Department of Education - Mathematics Master Coaching Kentucky Department of Education - Foundations for Early Childhood Kentucky Department of Education - Foundations for Primary Grades Kentucky Department of Education - Foundations for Middle Grades Kentucky Department of Education - Comprehensive Primary Kentucky Department of Education - Comprehensive Intermediate Kentucky Department of Education - Algebra Lesson Study Kentucky Department of Education - Math and Science Partnership Kentucky Numeracy Project Intensive Plus Grant*	Grant Funding Received \$64,752 \$47,639 \$57,896 \$79,783 \$152,245 \$41,567 \$41,567 \$41,567 \$41,567 \$38,829
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* Previously received awards - funds spent in this fiscal year

KENTUCKY CENTER FOR MATHEMATICS

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