

# Strategic Plan for Improving Mathematics Achievement in Kentucky



# Table of Contents

---

Table of Contents ..... 2

Committee for Mathematics Achievement (CMA) ..... 3

Mathematics Vision for Kentucky and Stakeholders ..... 4

Mathematics Strategic Plan Audience and Purpose ..... 6

Kentucky’s Key Priorities for Student Mathematics Achievement ..... 6

Key Priority 1: Student Empowerment ..... 8

Key Priority 2: Effective Mathematics Teaching and Learning ..... 10

Key Priority 3: Continuous Educator Development and Growth..... 12

Key Priority 4: Continuum of Learning ..... 14

Key Priority 5: Community and Family Partnerships ..... 17

Key Priority 6: Teacher Recruitment and Retention ..... 19

References ..... 21

# Committee for Mathematics Achievement (CMA)

The Committee for Mathematics Achievement (CMA) was created legislatively under [KRS 158.842](#) for the purposes of developing a multifaceted strategic plan to improve student achievement in mathematics at all levels of schooling, prekindergarten through postsecondary and adult.

## Committee for Mathematics Achievement Membership (2025)

Name	Organization	Role
Ashley Adams, Chair*	Pikeville Independent Schools	High School Mathematics Teacher
Chris Barwell*	Campbell County Public Schools	Middle School Administrator
Melissa Biggerstaff*	Allen County Public Schools	District Administrator/Math Coach
Kelly DeLong*	Kentucky Center for Mathematics	Kentucky Center for Mathematics Director
Mason Dyer	Association of Independent Kentucky Colleges and Universities	President
Amanda Ellis	Council on Postsecondary Education	Vice President of P-20 Policy and Programs
Donna Froedge	Metcalfe County Public Schools	Elementary Math Coach
Zac Gibbins*	Whitley County Adult Education	Adult Education Instructor
Funda Gonulates*	Northern Kentucky University	Professor of Mathematics
Jeanie Stumbo Jones	Carter County Public Schools	Elementary Math Teacher
Stacy Justus*	Jefferson County School District	District Mathematics Instructional Coach
Amy Leasgang*	Bullitt County Public Schools	Middle School Math Teacher
Jamie Link	Education and Workforce Development Cabinet	Secretary of Education and Workforce Development Cabinet
Alvia Littleton	Christian County Public Schools	Elementary Math Teacher
Jamie-Marie Miller*	Eastern Kentucky University	Professor of Mathematics
Anthony Mires*	AdvanceKentucky	Executive Director of AdvanceKentucky
Michael Phillips	Spencer County Public Schools	High School Principal
Natalie Rashad	Jefferson County Public Schools	Middle School Math Teacher
Chrystal Rowland*	Kentucky Department of Education	Commissioner's Designee & Director of Program Standards
Joanna Stevens	Garrard County Public Schools	High School Mathematics Teacher
Jason Taylor	Kentucky Community and Technical College	Faculty
Edward Thome*	Murray State University	Associate Professor of Mathematics
Kim Zeidler-Waters	PIMSER	Executive Director of PIMSER

\*Denotes membership of the Mathematics Strategic Plan Development Subcommittee

# Mathematics Vision for Kentucky and Shareholders

---

The Committee for Mathematics Achievement (CMA) envisions a Kentucky where all students can competently and flexibly use mathematical ideas to see the mathematics around them and to think critically and solve problems throughout their lives.

The efforts to address improved mathematics achievement should be collaborative and systematic. To achieve this goal, the committee identified six key priorities to ensure a system that:

- Empowers students to envision and realize their mathematical potential;
- Supports effective mathematics teaching to increase student learning and engagement, utilizing balanced assessments;
- Increases opportunities for math-specific professional learning for teachers and administrators to advance professional practice and student outcomes;
- Provides a continuum of learning across a student's educational journey (P-20) to ensure successful attainment of mathematical skills;
- Engages families and community partners as critical agents in supporting student achievement in mathematics; and
- Addresses the need to recruit, hire, retain and support effective mathematics teachers to build a growing and vibrant teaching community.

Mathematics achievement is a collaborative enterprise and requires support and engagement from a variety of shareholders to ensure success. These include:

- **Students** who ask questions, set goals and engage in opportunities to develop their understanding of mathematics.
- **Teachers** who deliver tier 1 mathematics instruction, including those who support students' access to tier 1 content through tier 2 and tier 3 or multilingual support.
- **Families** who work together with teachers to support their students in building math skills and fostering a positive outlook on mathematics.
- **Preschool and early learning programs** that promote the discovery of mathematical concepts.
- **Community-based organizations** that are positioned to provide academic support to students.
- **School and district administrators** who cultivate and champion the vision for mathematics education and ensure that teachers have the necessary tools, resources and support to provide high-quality, Tier 1 mathematics instruction to all students.
- **State educational leaders and organizations** who collaborate to provide comprehensive opportunities for educator development and growth.
- **Adult Education Centers** who support adults in improving their mathematical skills and knowledge
- **Colleges and universities** who prepare future mathematics educators and build a diverse STEM workforce.
- **Governing bodies** that develop policies and statutes that govern schools and school systems.

## Kentucky Numeracy Counts Act (2024)

In 2024, the Kentucky General Assembly passed House Bill 162, the *Kentucky Numeracy Counts Act* (KNCA) to support students in grades K-3 needing to make accelerated progress toward proficiency in mathematics. As stated in [KRS 158.791\(1\)\(b\)](#), “[i]t is Kentucky’s goal that all children have the skills necessary to demonstrate procedural skill and fluency, building from conceptual understanding to application, in order to solve real-world problems.” [KRS 158.8402\(1\)](#) requires the Kentucky Board of Education (KBE) to promulgate regulations to define and establish a multi-tiered system of supports that shall include evidence-based mathematics instruction, intervention, and instructional strategies for district-wide use for students in kindergarten through grade three (3).

Per KRS 158.8402(5)(a), “by January 1, 2026, each superintendent or public charter school board of directors shall select:

1. At least one universal screener for mathematics that is determined by the department to be valid and reliable to be administered to all students in kindergarten through grade three (3); and
2. At least one (1) diagnostic assessment for mathematics that is determined by the department to be reliable and valid to be administered as part of a multitiered system of supports for students in kindergarten through grade three (3).” Statute further requires that, “[b]eginning with the 2026-2027 school year, a universal screener determined by the department to be valid and reliable shall be given in the first thirty (30) calendar days of the school year to each student in kindergarten through grade three (3) at a public school or public charter school,” (6).

If the results of the universal screener demonstrate a student’s rate of progress toward proficient performance in mathematics needs accelerated intervention, KRS 158.8402(8) requires that “[a] mathematics improvement plan shall be developed and implemented in the first sixty (60) calendar days of the school year by a mathematics improvement team for any student in kindergarten through grade three (3) identified as needing accelerated interventions to progress toward proficient performance in mathematics.”

In addition, [KRS 164.3061\(2\)](#) provides that “beginning with the 2025-2026 school year, “postsecondary institutions offering teacher preparation programs for elementary regular education shall include kindergarten through grade three (3) evidence-based instructional strategies, department-identified valid and reliable high-quality resources for mathematics instruction related to KRS 158.8402.” Statute also provides that the Education Professional Standards Board (EPSB) shall:

(a) develop and maintain a list of approved teacher preparation assessments that are determined by the board to be an effective evaluation of mathematics instruction, content and practice standards, and skills; and

(b) Develop an evaluation rubric for observing teacher candidates with focus on mathematics content and pedagogical knowledge,” (3). Furthermore, statute requires that the EPSB “report program data to an external evaluator for analysis of postsecondary teacher preparation programs with the goal of using the results to help increase the success of new teacher candidates in demonstrating mathematics instruction, content knowledge, and skills, (4).



# Mathematics Strategic Plan Audience and Purpose

---

The Committee for Mathematics Achievement's Mathematics Strategic Plan is designed to support all shareholders in the alignment of efforts to improve student achievement in mathematics for Kentucky's students, at all levels of schooling, prekindergarten through postsecondary and adult. This plan is multifaceted and represents goals, actions and considerations around six key priorities. The included goals, actions and considerations address the components of KRS 158.842 (1)(a-m) and represent achievable and measurable steps to ensure student success.

As such, the CMA will monitor the goals and periodically make adjustments to the strategic plan as deemed appropriate. Per KRS 158.842 (11), this plan serves to provide guidance to policy makers in the development of statewide policies in the identification and allocation of resources to improve mathematics achievement for Kentucky's P-20 students.



# Kentucky's Key Priorities for Student Mathematics Achievement

---

## Key Priority 1 Student Empowerment



*Empower students to envision and realize their mathematical potential.*

## Key Priority 2 Effective Mathematics Teaching and Learning



*Support effective mathematics teaching to increase student learning and utilize balanced assessments.*

## Key Priority 3 Continuous Educator Development and Growth



*Increase math-specific professional learning for teachers and administrators to advance professional practice and student outcomes.*

## Key Priority 4 Continuum of Learning



*Provide a continuum of learning across a student's education journey (P-20) to ensure successful attainment of mathematical skills*

## Key Priority 5 Community and Family Partnerships



*Engage families and community partners as critical agents in supporting student achievement in mathematics.*

## Key Priority 6 Teacher Recruitment and Retention



*Recruit, hire, retain and support effective mathematics teachers to build a growing and vibrant teaching community.*

# Key Priority 1: Student Empowerment



Empowering students as agents of their own learning cultivates interest, motivation, self-agency and self-efficacy. Research indicates that there is a strong connection between self-efficacy, mathematics self-concept, interest and perceived usefulness of mathematics (Pajares & Miller, 1994). Additionally, motivation impacts self-efficacy, affecting metacognitive experiences after solving tasks (Özcan & Eren Gümüş, 2019). Providing students with the opportunity to be active participants and shared decision-makers in their educational journey can increase their investment in a subject, support a sense of identity as a learner and foster motivation for success. Acknowledging that students learn differently, a classroom that promotes high self-efficacy allows for exploration through various methods, such as inquiry, unstructured play, problem-based learning and hands-on activities, resulting in deeper learning (Zakariya et al., 2021). By providing a safe learning environment and empowering students to be partners in learning, educators can nurture both mathematical achievement and a lifelong love of learning.

Goals	Recommended Actions
<p><i>Create safe and respectful learning environments to encourage mathematical exploration and promote student confidence as a partner in learning.</i></p>	<p><i>Set clear classroom expectations, goals and norms.</i></p> <p><i>Employ activities that promote teamwork and help students develop social skills and foster a sense of belonging.</i></p> <p><i>Implement social, emotional and academic development activities in mathematics classrooms.</i></p>
<p><i>Shift student mindsets from fixed to growth.</i></p>	<p><i>Normalize mistake making by providing opportunities to help students understand that sharing their mathematical intuition, making mistakes and reflecting on those thoughts and mistakes are a natural catalyst for learning.</i></p> <p><i>Develop a toolkit of mathematical growth mindset activities and resources for educators and families.</i></p> <p><i>Provide activities and resources that encourage student sharing of their questions and conceptual understanding as a means to provide real time formative guidance.</i></p>
<p><i>Cultivate a strong sense of math efficacy and self-agency.</i></p>	<p><i>Provide student choice opportunities in the mathematics classroom.</i></p> <p><i>Provide students time for self-reflection activities.</i></p> <p><i>Provide students and families activities that promote experiences with expanded independent and collaborative problem solving.</i></p>



# Key Priority 1: Student Empowerment (cont.)



## Considerations and Resources

- *How might a school develop, support and sustain structures and strategies that meet the needs and aspirations of all students for a more equitable and engaging learning experience?*
- *What steps can be taken to explicitly provide students with opportunities and experiences that support student empowerment and foster the skills students need to develop to be proficient self-directed learners?*
- *Promoting trustful and respectful relationships between students and teachers and students and their schools will take time, effort and consistency. How can school leaders support these relationships and growth mindset attitudes between students and teachers to not only empower students to be confident and engaged learners, but also positive and proactive community members?*

[Creating Classroom Norms](#)

[Integrating Social, Emotional and Academic Development \(SEAD\) within the KAS for Mathematics](#)

[Mathematical Mindset Practices](#)

[The Power of a Good Mistake](#)

[Developing Independent Learners](#)

[Building independence in Preschoolers](#)



## Key Priority 2: Effective Mathematics Teaching and Learning



Effective mathematics teaching and learning is multidimensional. A local curriculum anchored in high quality instructional resources (HQIR) supports the learning goals, outcomes and core competencies that students must demonstrate to make continuous progress in mathematics. It also provides teachers with an array of pedagogical supports to help meet the needs of all learners (KY Instructional Resources Consumer Guide for Mathematics, 2023). Research indicates that an HQIR can reduce variability in the quality of instruction across classrooms (SREB, 2017), and students in classrooms that used one HQIR for four consecutive years outpaced comparison students by a margin of 38 percentile points — equivalent to four additional years of learning (Steiner, 2018).

Teachers also benefit from curriculum-based professional learning that is ongoing, job-embedded and rooted in active experiences that allow teachers to evolve their practices, expand their content knowledge and challenge their beliefs (Curriculum-Based Professional Learning Guidance Document, 2023). This approach to professional learning centers on supporting teachers as they implement the local curriculum, using their HQIR, to ensure all students have access to high-quality standards-aligned tier 1 instruction with appropriate scaffolds and supports.

District and school leaders are responsible for creating systems and structures to support educators in implementing a balanced system of assessment that includes screener, diagnostics and curriculum-based measures and leverage the data to support teachers in noticing, recognizing and responding to evidence of student learning.

Goals	Recommended Actions
<p><i>Design and implement a comprehensive local curriculum that is aligned to the Kentucky Academic Standards for Mathematics and anchored in HQIR.</i></p>	<p><i>Provide ongoing, job embedded curriculum-based professional learning to support teachers in deepening their mathematical content knowledge, understanding of effective evidenced-based practices for mathematics and facility in utilizing their HQIR to meet the unique needs of their students.</i></p> <p><i>Math teachers ensure students engage with Kentucky Academic Standards for Mathematics and the Standards for Mathematical Practice (SMPs) and teachers utilize the Effective Mathematics Teaching Practices (EMTPs)</i></p> <p><i>Schools and districts adopt HQIRs for mathematics and ensure professional learning systems support ongoing training in the use of those HQIRs.</i></p> <p><i>Classroom teachers have a role in their school/district for reviewing and choosing HQIRs.</i></p> <p><i>Create safe learning environments that build student confidence in mathematics and connect content clearly to all students' lives and real-world applications.</i></p>

## Key Priority 2: Effective Mathematics Teaching and Learning (cont.)



Goals	Recommended Actions
<p><i>Support all students, including students with exceptionalities and multilingual learners, with access to grade-level, standards-aligned Tier 1 instruction through the appropriate use of scaffolds and support.</i></p>	<p><i>Educators leverage the data from all assessments to identify student knowledge and understanding, diagnose student needs and unfinished learning.</i></p> <p><i>Provide the necessary scaffolds to ensure all students have access to grade-level mathematics instruction.</i></p> <p><i>Intentionally utilize supports within the instructional resource within tier 1 to ensure students master grade-level content and coordinate tier 2 and tier 3 supports to drive success in tier 1 learning.</i></p>
<p><i>Implement a balanced assessment system that includes diagnostics, screeners and curriculum-based measures and support educators in leveraging the data to identify and address student learning needs.</i></p>	<p><i>District and school leaders develop a comprehensive assessment plan that includes valid and reliable diagnostics, screeners and curriculum-based measures.</i></p> <p><i>School leaders support teachers in using formal and informal assessment measures, strategies, tools and data (including student work) to make instructional decisions and interpret information from each source in valid and equitable ways.</i></p>

### Considerations and Resources

- *What supports are in place to ensure that district mathematics curricula is high quality and that all teachers are effectively prepared to utilize it in their classrooms?*
- *How does district leadership ensure mathematics professional learning opportunities are ongoing, job-embedded and highly effective for teachers and administrators?*
- *How is data used to effectively meet the needs of ALL students with mathematical growth?*

[Kentucky Academic Standards for Mathematics](#)  
[Effective Mathematics Teaching Practices](#)  
[High Quality Instructional Resources](#)  
[Multi-tiered Support Systems \(MTSS\)](#)  
[The Kentucky Numeracy Counts Website](#)  
[Math Fact Fluency Companion Website](#)  
[Kentucky Numeracy Project](#)

# Key Priority 3: Continuous Educator Development Growth



Ongoing professional development—through professional learning communities (PLCs), workshops, coaching and classroom observations—is essential for teachers and leaders to deepen their understanding of curriculum and high-quality instructional practices (Instruction Partners, 2019). Math-specific learning is crucial for refining teaching methods, aligning assessments and improving student outcomes in problem-solving, critical thinking and real-world application, ensuring alignment with *Kentucky Academic Standards for Mathematics*. Educators need professional learning that deepens understanding of what to teach, improves content knowledge and pedagogy through exploring how best to teach it and facilitates transfer by being connected to the curriculum used in classrooms (Rivet, 2020). By offering content-specific support and fostering collaboration, educators can cultivate a positive classroom culture focused on improved outcomes and growth, ultimately driving continuous improvement in math instruction and student success.

Goals	Recommended Actions
<p><i>Provide opportunities for teachers (P-20) to engage in math-specific personalized professional learning that includes opportunities to collaborate with peers, develop an aligned math curriculum, build their capacity to use HQIRs through high quality professional learning (HQPL), engage in math coaching and deliver effective mathematics instruction that advances learning outcomes for all students.</i></p>	<p><i>District and schools will <u>collaborate</u> within and across different grade levels - vertical and horizontal alignment.</i></p> <p><i>Districts and schools <u>develop</u> a Professional Learning Plan in collaboration with math teachers that identifies math-specific personalized professional learning needs of teachers, school and district with cohesive and viable strategies that align to those needs.</i></p> <p><i>The district/school professional learning plan is <u>implemented</u> by each teacher to include math-specific personalized professional learning, curriculum development and use of HQIR.</i></p> <p><i>Districts and schools <u>engage</u> in innovative teacher academies or coaching models related to evidence-based practices in instruction, instructional materials, and assessment in mathematics.</i></p> <p><i>Teachers engage in HQPL in foundational math topics (e.g., numeracy content knowledge, fluency, interconnectedness of topics).</i></p> <p><i>District and elementary schools within the district identify a core team (teachers and administrators) that will participate in Kentucky Numeracy Counts Academies.</i></p> <p><i>Expand network of teachers by staying connected to local and nationwide mathematics teacher organizations such as the National Council of Teachers of Mathematics (NCTM).</i></p> <p><i>Provide pathways for mathematics teachers to take on leadership roles within their schools, such as leading professional development sessions or mentoring new teachers.</i></p>

## Key Priority 3: Continuous Educator Development and Growth (cont.)



Goals	Recommended Actions
<p><i>Promote HQPL for district and school leaders to implement systems and structures to ensure effective mathematics teaching and learning.</i></p>	<p><i>District and school leaders create/use/adapt detailed frameworks for selecting and implementing the Kentucky Academic Standards (KAS) aligned high quality mathematics materials and will make sure it is consistently used across all schools in the district.</i></p> <p><i>District and school leaders, in collaboration with mathematics teachers, create a vision for effective teaching and learning expectations for all students</i></p> <p><i>State mathematics education partners create professional learning networks and learning opportunities for leaders to effectively:</i></p> <ul style="list-style-type: none"> <li><i>-Deeper their understanding of mathematical concepts</i></li> <li><i>-Create systems and structures for high-quality, standards aligned mathematics materials and the design and implementation of a multi-tiered system of supports (MTSS)</i></li> </ul>
<p><i>Collaborate with postsecondary institutions to cultivate the successful onboarding, growth and retention of all math teachers.</i></p>	<p><i>Postsecondary institutions should include in their educator preparation programs: evidence-based instructional strategies, HQIR for mathematics instruction, the use of a range of assessment data for designing instruction and intervention, progress monitoring of student performance and field experiences, and student teaching placements with teachers that model effective mathematics instruction.</i></p>

### Considerations and Resources

- *How might a district provide dedicated time and space for teachers and administrators to reflect on current mathematics instruction, highlighting and continuing effective teaching practices and modifying or eliminating ineffective strategies?*
- *What can a district do to create opportunities for regular and ongoing collaboration, providing teachers with opportunities to engage with colleagues to share and learn new instructional practices?*
- *What opportunities are available for teachers to participate in math-specific high-quality professional learning to support mathematical content knowledge and pedagogy?*

[Characteristics of High-Quality Professional Learning \(Kentucky Department of Education \(KDE\)\)](#)

[Roadmap to Implementing High-Quality Mathematics Instruction](#)

[KDE Professional Learning Resources](#)

[Kentucky Numeracy Counts Act Web Page](#)

[Assisting Students Struggling with Mathematics: Intervention in the Elementary Grades](#)

[Model Curriculum Framework – KYStandards](#)

[Kentucky Curriculum-Based Professional Learning Guidance Document](#)

[Kentucky Center for Mathematics](#)

## Key Priority 4: Continuum of Learning



Mathematical learning persists throughout a person’s lifetime. A continuum of learning recognizes that the development of mathematical understanding begins early in life and continues through adulthood. Likewise, mathematical growth and skill refinement develop across successive levels of education (Kaiser, 2020), supporting the connection between classroom learning of mathematics and real-world applications. As mathematics education continues into post-secondary education, adult education and/or the workforce, intentional, ongoing collaboration and communication across all levels can support transitions from P-12 to adult education and beyond.

Goals	Recommended Actions
<p><i>Prepare and implement plans for smooth mathematical transitions throughout and beyond P-12 education.</i></p>	<p><i>Implement intentional structures, routines and practices for all students that promote smooth transitions from one mathematics course to another.</i></p> <p><i>Create and review transitional courses for high school students that focus on reinforcing key mathematical skills as needed to prepare for success in post-secondary education, whether they are entering a college, technical, or adult education environment</i></p> <p><i>Develop clear and accessible pathways that outline mathematics progression from P-12 to post-secondary education and workforce readiness, ensuring students and families understand the options available.</i></p>
<p><i>Collaborate to involve relevant stakeholders among P-20 educators.</i></p>	<p><i>Collaborate to develop a communication plan that defines vertical expectations across grade levels P-20, supporting student growth in mathematics through consistent instructional models, manipulatives and strategies.</i></p> <p><i>Develop and distribute local curriculum guides that outline the upcoming mathematical concepts and skills for each grade level.</i></p>
<p><i>Implement high-leverage strategies that support the retention of foundational skills from year to year and beyond.</i></p>	<p><i>Adopt a district-wide standard for systematic revisiting of core skills as a fundamental part of the learning process, supporting long-term mastery and retention.</i></p> <p><i>Ensure the use consistent mathematical language and discourse across grade levels to support students’ retention and understanding of key concepts.</i></p> <p><i>Use problem-solving challenges and real-world applications in early mathematics education, providing students with meaningful, enjoyable experiences that motivate them to persist in their studies and consider advanced math-related careers.</i></p>



## Key Priority 4: Continuum of Learning (cont.)

### Considerations and Resources

- *How might school structure and progression through mathematics courses support students' access to post-secondary education or workforce readiness?*
- *In what ways are parents, guardians and other community members receiving information about the learning progressions? Does the communication include support for understanding the transitions clearly?*
- *Districts should have open lines of communication with their local adult education centers. Adult education programs offer “on-ramping” services to all people aged 18 and up to prepare them for college and careers, including recent high school or GED® graduates as well as those seeking GED® services prior to enrolling in college. A Test of Adult Basic Education (TABE) will provide adult education instructors with information about individual student needs and how to most effectively improve their likelihood of success with college and career level mathematics. All adult education services in Kentucky are free.*
- *What might be some manipulatives, strategies or concepts that might be useful to share with other educators?*

[Considerations for Retention of Math Learning](#)

[Retention Support by utilizing Summer Bridge Programs](#)

[PIAAC – What PIAAC Measures](#)

[Kentucky Early Mathematics Testing Program \(KEMTP\) Information](#)





# Key Priority 5: Community and Family Partnerships

The responsibility for Kentucky’s students’ mathematical development is a collaborative enterprise among parents, school staff and community members. Research shows that programs and interventions that engage families in supporting their student’s learning at home produce higher student achievement (Henderson, A. T., & Mapp, K. L., 2002). Students of all ages perform better when they make a solid adjustment to school, meaning they feel comfortable and respected, feel they belong at school and feel supported by the teacher (Henderson, A. T., & Mapp, K. L., 2002). Family involvement strategies for mathematics should be continuous, across all levels of their student’s education, and evolve to meet the changing role that parents play as their student develops into young adulthood (*National Association for Family, School and Community Engagement, 2024*). Schools should establish community partnerships with local agencies and organizations that offer resources (e.g., afterschool programs, health, mental health, mentors, etc.) to help engage students and support academic proficiency, behavior and social-emotional development (KyMTSS, 2021).

Goals	Recommended Actions
<i>Empower families to be actively involved in their student’s mathematical development through sharing student performance data, providing information regarding academic standards and the mathematical content being studied and involving them in shared decision-making regarding academic improvement and interventions.</i>	<i>Support families in early grades in the math improvement plan under the Kentucky Numeracy Counts Act by involving them in creating and implementing strategies for student growth and proficiency.</i>  <i>Provide resources to empower caregivers to support students mathematical learning at home.</i>  <i>Develop a family engagement toolkit.</i>  <i>Provide information and resources around mathematics content for community partners to utilize with students.</i>





## Key Priority 5: Community and Family Partnerships (cont.)

Goals	Recommended Actions
<i>Support students and their families for transitions from elementary to middle school, middle school to high school and high school to post secondary.</i>	<p><i>Schools provide information for students and families about what to expect at the next level of schooling.</i></p> <p><i>Schools provide tours, question and answer sessions and other low-stakes opportunities for students and families to become more familiar with the school and the expectations for success.</i></p> <p><i>School leaders and teachers collaborate across school levels to design comprehensive and targeted transition activities that foster a sense of community and communicate the important basics that students and families need to know for a great start.</i></p>
<i>Establish local community partnerships to provide additional support to students within mathematics.</i>	<p><i>Schools collaborate with local community partners such as tutoring programs, childcare centers and public libraries to share information and resources about the mathematics that students are studying and find ways they can partner to further student learning.</i></p>

### Considerations and Resources

- *What activities can be implemented that connect families and community partners with school wide initiatives? What is already in place? How could these activities be implemented at the district level?*
- *How can transitions between elementary and middle school, and middle and high school be supported for both students and parents to ensure success? What information is available for families? What measures are in place to ensure that all students and families have opportunities for asking questions and sharing concerns?*
- *What community partnerships could be established to support students throughout their educational journey?*

[Family Partnership Council \(FPC\) - Kentucky Department of Education](#)  
[Standards Family Guides & Resources – KYstandards](#)  
[Family Mathematics Resources – KYstandards](#)  
[The impact of parental involvement \(research summary\)](#)  
[Kentucky Family Math Resources](#)

## Key Priority 6: Teacher Recruitment and Retention



The ability to recruit and retain highly effective mathematics teachers plays a crucial role in supporting student achievement and growth. Because many teachers often leave the field within their first three to five years due to “lack of support and professional development” and other factors (Cells. et al, 2023), it is imperative that new and developing teachers are intentionally supported through high-quality professional learning. Additionally, there is a national shortage of qualified STEM teachers, due to inadequate preparation and lower enrollments in Teacher Preparation Programs (Fuentes & Bloom, 2023), further exacerbating the current challenges in teacher recruitment.

Goals	Recommended Actions
<i>Increase the number of highly effective mathematics teachers by actively recruiting teacher candidates using a multilayered approach.</i>	<p><i>Develop and implement an active recruiting model.</i></p> <p><i>Work with other professions to find mathematics teacher candidates.</i></p> <p><i>Attract and recruit job seekers who can fill vacancies through job fairs and social media.</i></p>
<i>Collaborate within the P-20 community regarding mathematics preparation to ensure consistency in highly effective pre-service experiences.</i>	<p><i>Strengthen educator preparation programs to include mathematics pedagogy for interdisciplinary early childhood education (IECE) and K-5 certifications.</i></p> <p><i>Communicate with post-secondary institutions and alternative certification partners to ensure high quality and similar mathematical pedagogy.</i></p> <p><i>Incorporate mathematics HQIRs, evidence-based practices, including those that are specific to mathematics, and KAS for Mathematics-aligned grade level rigor within pre-service programs and clinical experiences.</i></p> <p><i>Establish ongoing and focused collaboration between the KDE and with the Educational Professional Standards Board (EPSB)/educator preparation programs to strengthen mathematical content knowledge in elementary school educators within and across grade levels.</i></p>
<i>Develop onboarding plans and support structures to ensure long-term retention of mathematics teachers.</i>	<p><i>Assign new and developing teachers mathematics mentors and coaches.</i></p> <p><i>Provide intentional, grade level-specific mathematics professional learning opportunities.</i></p>

# Key Priority 6: Teacher Recruitment and Retention (cont.)



## Considerations and Resources

- *What programs are currently in place to attract and retain effective mathematics teachers? What evidence do we have of their effectiveness? What might be opportunities for improvement?*
- *Are there paraeducators in the district who are considering becoming certified? What measures could be put in place to support the transition to becoming a classroom teacher?*
- *How are new/new to the district teachers currently supported? Are these staff members supported beyond the first year? Could additional initiatives be provided to ensure new staff members have the resources and collaborative relationships needed to be successful in the classroom?*
- *What measures are in place to encourage effective certified teachers to remain in the profession? How are experienced teachers supported beyond professional learning experiences?*

[Grow Your Own Programs](#)

[Educators Rising Kentucky](#)

[Teaching and Learning Career Pathway](#)

[Inspiring the Next Generation of Kentucky's Teachers - GoTeachKY](#)

[Kentucky Educator Mentorship Program \(KEMP\) Guidance](#)



# References

---

Cells, P., Sabina, L., Touchton, D., Shankar-Brown, R. & Sabina, K. (2023). Addressing Teacher Retention within the First Three to Five Years of Employment. *Athens Journal of Education*, 10(2), 345-364.

Fuentes, S. & Bloom, M. (2023). The Intricacies of the STEM Teacher Shortage. *The Electronic Journal for Research in Science and Mathematics Education*. 27(2), i-vii.  
<https://ejrsme.icrsme.com/article/view/23733/14924>

Henderson, A. T., & Mapp, K. L. (2002). A new wave of evidence: The impact of school, family and community connections on student achievement. Southwest Educational Development Laboratory.  
<https://sedl.org/connections/resources/evidence.pdf>

Instruction Partners. (2019). Conditions and practices for Effective Teacher Support Models. Retrieved from <https://instructionpartners.org/2019/12/12/conditions-practices-for-effective-teacher-support-models/>

Kaiser, G. (2020). Mathematical Modeling and Applications in Education. *Encyclopedia of Mathematics Education*. 553-561.

Kentucky Department of Education. (2023) Curriculum-Based Professional Learning Guidance Document. [https://www.education.ky.gov/curriculum/standards/kyacadstand/Documents/Curriculum\\_Based\\_Professional\\_Learning\\_Guidance\\_Document.pdf](https://www.education.ky.gov/curriculum/standards/kyacadstand/Documents/Curriculum_Based_Professional_Learning_Guidance_Document.pdf)

Kentucky Department of Education. (2023) Kentucky Mathematics Instructional Resources Consumer Guide. [https://www.education.ky.gov/curriculum/standards/kyacadstand/Documents/Mathematics\\_Instructional\\_Resources\\_Consumer\\_Guide.Pdf](https://www.education.ky.gov/curriculum/standards/kyacadstand/Documents/Mathematics_Instructional_Resources_Consumer_Guide.Pdf).

KyMTSS.org. *Family, School and Community Partnerships*. 29 March 2021, [kymtss.org/essential-elements/family-school-and-community-partnerships/Family, School and Community Partnerships – KyMTSS](https://kymtss.org/essential-elements/family-school-and-community-partnerships/Family_School_and_Community_Partnerships_-_KyMTSS).

National Association for Family, School and Community Engagement. *Family Engagement Defined*. [nafsce.org/page/definition](https://nafsce.org/page/definition). Accessed 19 Sept. 2024.

Özcan, Z. Ç., and Eren Gümüş, A. (2019). A modeling study to explain mathematical problem-solving performance through metacognition, self-efficacy, motivation and anxiety. *Aust. J. Educ.* 63, 116–134. doi: 10.1177/0004944119840073

Pajares, F., and Miller, M. D. (1994). Role of self-efficacy and self-concept beliefs in mathematical problem solving: a path analysis. *J. Educ. Psychol.* 86, 193–203. doi: 10.1037/0022-0663.86.2.193

Project Tomorrow. (2021). Findings From the 2020-21 Speak Up Research Project. Retrieved from <https://files.eric.ed.gov/fulltext/ED615843.pdf>

Rivet Education. (2020). What exactly is “high-quality professional learning”? Retrieved from <https://riveteducation.org/what-exactly-is-high-quality-professional-learning/>

## References (cont.)

---

SREB. (2017). Alignment of instructional materials: Trends in state efforts. Southern Regional Education Board. Retrieved from <https://insights.sreb.org/reports/instructionalmaterials.pdf>

Steiner, D., Magee, J., & Jensen, B. (with Button, J.). (2018). What we teach matters: How quality curriculum improves student outcomes. Learning First. <http://learningfirst.com/wp-content/uploads/2020/07/1.-What-we-teach-matters.pdf>

Zakariya, Y. F. (2021). Self-efficacy between previous and current mathematics performance of undergraduate students: an instrumental variable approach to exposing a causal relationship. *Front. Psychol.* 11, 1–11. doi: 10.3389/fpsyg.2020.556607