KY MATH SUMMIT BRIEF
This brief is a synthesis of 89 Kentucky mathematics educators expert input gathered at the KY Math Summit.
Content

Overview
Data review
Teacher Preparation
KY Solutions for KY Students
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Actionable Next Steps
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Overview
Eighty-nine dedicated Kentucky mathematics experts gathered to analyze data and brainstorm possible trends and solutions to advance mathematics across Kentucky. This influential event provided a platform for dedicated mathematics educators to discuss, analyze, and propose research-based solutions, with the aim of enhancing student achievement in mathematics across the state.

- 40 Classroom Teachers
- 20 State-level Math Experts
- 11 University Faculty
- 18 KY Educational Cooperative Stakeholders
KY Math Summit Experts in Action

KCM facilitated Kentucky math experts as they analyzed data and looked for trends.

KAMTE lead Kentucky math experts to give input on teacher preparation in our state.

KCTM guided Kentucky stakeholders as they shared their input on success in mathematics education.

Full video of the KY Math Summit can be accessed at https://www.youtube.com/watch?v=R3LWkYNbIk8
KENTUCKY MATH
SUMMIT

ANALYSIS OF
KY NATIONAL ASSESSMENT OF
EDUCATIONAL PROGRESS (NAEP) DATA

Full Report can be found at: https://nces.ed.gov/nationsreportcard/pubs/stt2022/2023011.aspx

visit www.nationsreportcard.gov to access all NAEP data
LOOKING AT THE KY NAEP DATA

OVERALL RESULTS

• In 2022, the average score of fourth-grade students in Kentucky was 234. This was not significantly different from the average score of 235 for students in the nation.
• The average score for students in Kentucky in 2022 (234) was lower than their average score in 2019 (239) and was higher than their average score in 2000 (219).
• The percentage of students in Kentucky who performed at or above the NAEP Proficient level was 33 percent in 2022. This percentage was smaller than that in 2019 (40 percent) and was greater than that in 2000 (17 percent).
• The percentage of students in Kentucky who performed at or above the NAEP Basic level was 75 percent in 2022. This percentage was smaller than that in 2019 (81 percent) and was greater than that in 2000 (59 percent).

Average KY vs National 4th Grade math scores
LOOKING AT THE KY NAEP DATA

OVERALL RESULTS

- In 2022, the average score of eighth-grade students in Kentucky was 269. This was lower than the average score of 273 for students in the nation.
- The average score for students in Kentucky in 2022 (269) was lower than their average score in 2019 (278) and was not significantly different from their average score in 2000 (270).
- The percentage of students in Kentucky who performed at or above the NAEP Proficient level was 21 percent in 2022. This percentage was smaller than that in 2019 (28 percent) and was not significantly different from that in 2000 (20 percent).
- The percentage of students in Kentucky who performed at or above the NAEP Basic level was 67 percent in 2022. This percentage was smaller than that in 2019 (67 percent) and was not significantly different from that in 2000 (80 percent).

Average KY vs National 8th Grade math scores

* Significantly different ($p < .05$) from 2022. Significance tests were performed using unrounded numbers.
SUMMIT KENTUCKY NAEP DATA NOTICINGS

**4th Grade**
- 4th Grade started below national average, but has been near or above national average since 2009
- Grade 4 scores peaked 2011-2015
- For elementary, we are still well above where we were in 2000s.
- KY mirroring the national trend in NAEP scores (+2 from national average)

**8th Grade**
- Grade 8 consistently below the national averages
- Grade 8 peaked in 2011 and has been in decline since
- Data comparison shows that the percentage of students on or above mathematics benchmarks (same cohort) decreases as they move from 4th grade to 8th grade.
- Post-COVID, scores were at the same levels they were in the early 2000s.
- KY mirroring the national trend in NAEP scores (+4 from national average)
## KENTUCKY MATH SUMMIT

**Analysis of KY Summative Assessment (KSA) Data**

Visit [kyschoolreportcard.com](http://kyschoolreportcard.com) to access all KSA data.
### Grade 4

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<tr>
<th>Group</th>
<th>Novice</th>
<th>Apprentice</th>
<th>Proficient</th>
<th>Distinguished</th>
<th>Proficient / Distinguished</th>
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<td>32%</td>
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<tr>
<td>Two Or More Races</td>
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<td>White (Non-Hispanic)</td>
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<td>Students With Disabilities (IEP)</td>
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### Grade 8

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</table>
Trends within sub-groups
- Consistent trend of ~36-38% proficient or distinguished across grades 4-8.
- Gap between proficient and not proficient students increases as grade levels increase.
- The gaps for sub-groups, specifically African-Americans, and students with disabilities are large and need further focus.

Comparison between sub-groups
- Not hitting 40% proficiency OVERALL (subgroups are worse).
- Males and females have about the same proficiency.
- Students with disabilities are not making proficiency.
- No proficiency difference between students with disabilities with and without accommodations.
- Hispanic or Latino sub-group has greater than >70% scoring novice or apprentice.
- African-American students had an average score that was 27 points lower than White students.
QUESTIONS
GENERATED BY DATA

Trends within sub-groups
- Is there a lack of High Quality Instructional Resources for instruction in KY schools? What HQIRs are showing promise in KY?
- How much time are students getting in on-grade level Tier 1 instruction? Is there too much pull-out?
- Are all KY educators interpreting the Kentucky Academic Standards consistently?
- Are all KY educators implementing the Kentucky Academic Standards to their full intent?
- Are students getting grade level instruction in pullout groups? Does this account for the learning gaps by subgroups?
- Is the online assessment a factor in student scores?

Comparison between sub-groups
- Are the gaps in primary grades affecting higher grades? Is there a lack of foundational mathematics content?
- Is more mathematics specific professional development needed for primary teachers? Emphasis on KSA and SMPs.
- Is there a limited pool of mathematics certified teachers at the middle grades level?
- What Tier 2 resources and research-based strategies are used in middle school?
- Are students presented concepts with research-based pedagogy like CRA/CSA?
TEACHER PREPARATION
What are the affordances (benefits) of the current university approach to teacher preparation?

- Field experience from freshman year on allows pre-service teachers to gain valuable experience.
- There exists a community of learning within colleges of education.
- There is support of teachers in passing the Praxis for teacher certification.
- University-based teacher preparation provides connection between research and practice.
- University-based teacher preparation creates a productive tension between idealized instructional visions and the realities of our current system.

Beyond the University

- Articulation of experiences that extend into Years 1-3 of teaching in Kentucky public schools.
- Acknowledge that teaching is a profession of apprenticeship and create structures to support new teacher development with focus on mathematics, in particular.

What are the constraints (negatives) of the current university approach to teacher preparation?

- More hours of mathematics content and mathematics specific pedagogy are needed.
- There should be professional learning in MTSS.
- Ensure that supervising teachers have appropriate professional learning on how to supervise student teachers, including specific educative mentoring.
- Focus on Kentucky Academic Standards and Standards for Mathematical Practice.
- Fall student teaching experiences so as to start the school year with school, which is very important to pre-service teacher success.
KY SOLUTIONS FOR KY STUDENTS
THANK YOU TO THE EDUCATORS FROM ACROSS OUR STATE WHO SHARED THEIR EXPERTISE AT THE KY MATH SUMMIT

<table>
<thead>
<tr>
<th>Crystal Adams</th>
<th>Joy Campbell</th>
<th>Brack Herald</th>
<th>Leslie Lee</th>
<th>Kathy Price</th>
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<td>Shasta Hensley</td>
<td>Holly Lawrence</td>
<td>Jamala Pelfrey</td>
<td>Sumer Smith</td>
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KCM, KAMTE, and KCTM appreciates the input from these KY mathematics stakeholders. Each voice can be heard in the KY Solutions for KY Students summary statements in the following sections.
Videos of these amazing educators answering the three questions posed during the KY Solutions for KY Students section were shown during the KY Math Summit. Their answers launched the discussion of each question during the KY Math Summit. We appreciate their heartfelt input.
KY SOLUTIONS FOR KY STUDENTS

What are KY teachers doing **NOW** to influence student achievement?

What can KY (teachers and administrators and legislators and others) do to **SCALE** these practices across the state?

What does KY (teachers and administrators and legislators and others) need to do **NEXT** in order to improve student achievement even more?
What are KY teachers doing **NOW** to influence student achievement?

- Using High Quality Instructional Resources (HQIR) to support quality instruction.
- Utilizing high-yield instructional strategies, including greater focus on vertical coherence.
- Incorporating Standards for Mathematical Practice for students and Mathematical Teaching Practices for Teachers.
- Effectively using data, both at the individual teacher level and in PLC, to make informed instructional decisions.
- Intentionally differentiating (enrichment and MTSS) to meet the needs of all students.
What can KY (teachers and administrators and legislators and others) do to **SCALE** these practices across the state?

- Provide math coaching as a support for all teachers.
- Facilitate on-going and inclusive professional learning in the Kentucky Academic Standards and the Mathematics Teaching Practices for all educators.
- Support from state and local level leaders for professional learning, math coaching, and research-backed instructional supports.
What does KY (teachers and administrators and legislators and others) need to do **NEXT** in order to improve student achievement even more?

- Provide professional learning and financially support math coaches across districts and state.
- Improve coherence of mathematics instruction across the state.
- Increase collaboration of mathematics stakeholders across the state.
- Increase funding for professional learning, both pre-service and in-service educators.
- Provide professional learning that is content based and built into the school calendar.
PRIORITIZED SUMMARY OF KY MATH SUMMIT

1. High Quality Instructional Resources and research-based instructional strategies

KY Math Summit experts highlighted the success of HQIRs and research-based instructional strategies as an indicator of success. This supports the Kentucky data that show a Tier 1 need due to high numbers of novice and apprentice student mathematics scores. Strong, high quality instruction in Tier 1 leads to student success.

2. Math Coaching

KY Math Summit experts unanimously point to emerging research on the effective use of math coaching in schools. Kentucky is a national leader in mathematics coaching. With researchers from the University of Louisville, KDE has developed an effective design for building capacity in schools through math coaching. KCM collects data on the MAF coaching. The results show great promise in increasing teacher efficacy. KY Math Summit experts highlight math coaching as a priority for funding.

3. High Quality Professional Learning

High Quality Professional Learning has proven to be effective in supporting teachers efficacy in teaching mathematics. The KY Math Summit highlighted the need for mathematics focused HQPL customized for:
- Pre-service teachers
- In-service teachers
- School administrators

4. Effectively use data at teacher and school levels to inform instruction

KY Math Summit experts provided many examples of how data was effectively used to inform instruction and increase student achievement. Data from sub-group populations in Kentucky show a need for scaling successful use of data at teacher and school levels to inform math instruction for diverse learners. There is much research on effective implementation of Multi-Tier System of Support.
DATA ANALYSIS FROM NATIONAL IES MATH SUMMIT
In September of 2023, the Institute of Educational Studies, a national leader in educational policy, hosted a math summit much like the one in Kentucky. Below you will find summary information from Dr. Peggy Carr (Commissioner of the National Center for Educational Statistics) regarding reasons for the drop in mathematics NAEP test scores.

**Student Health and Well-being**
School surveys show there is insufficient staff and inadequate funding for the needs of children’s mental health issues. This is statistically shown as a cause.

**Confidence in Mathematics Skills**
Students in most states showed significant decreases in math skill confidence from 2019. 80% of the 4th grade score decline was associated with drop in confidence. 50% of the 8th grade score decline was associated with drop in confidence.

**Community Health and Income Factors**
Schools in counties with highest health and income profile (more community resources) saw less of a decline in their NAEP scores from 2019 to 2022. This data suggests that COVID’s impact was more profound in some communities than others.

**Absenteeism**
All states reported an increase in chronic absenteeism. Absenteeism accounted for 27% of the decline at grade 4 and 16% of the decline at grade 8.

**Teacher Vacancies**
16% of schools in high-poverty neighborhoods reported having at least 1 in 10 teacher vacancies, double that of low-poverty neighborhoods.

Data synthesized by NCES from NAEP monthly surveys for mathematics
Actionable Next Steps

Facilitate another Kentucky Math Summit to increase voice for more stakeholders.

Reconvene to further analyze the Kentucky mathematics data with special emphasis on sub-groups.

Facilitate input from school superintendents, accountability experts and chief academic officers.

Updated report to Joint Interim Committee on Education.
THANK YOU

The Kentucky Center for Mathematics

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Highland Heights, KY 41099