Math Curriculum Framework

KDE Pilot

KDE-Pilot to develop the Math Curriculum Consumer Guide

Math Curriculum Framework
- 289 page document

Consumer Guide
- 35 pages
- Makes the process easier for districts

3 District Pilot
- Floyd County
- Erlanger-Elsmere Independent
- Powell County

Meeting #1 Information

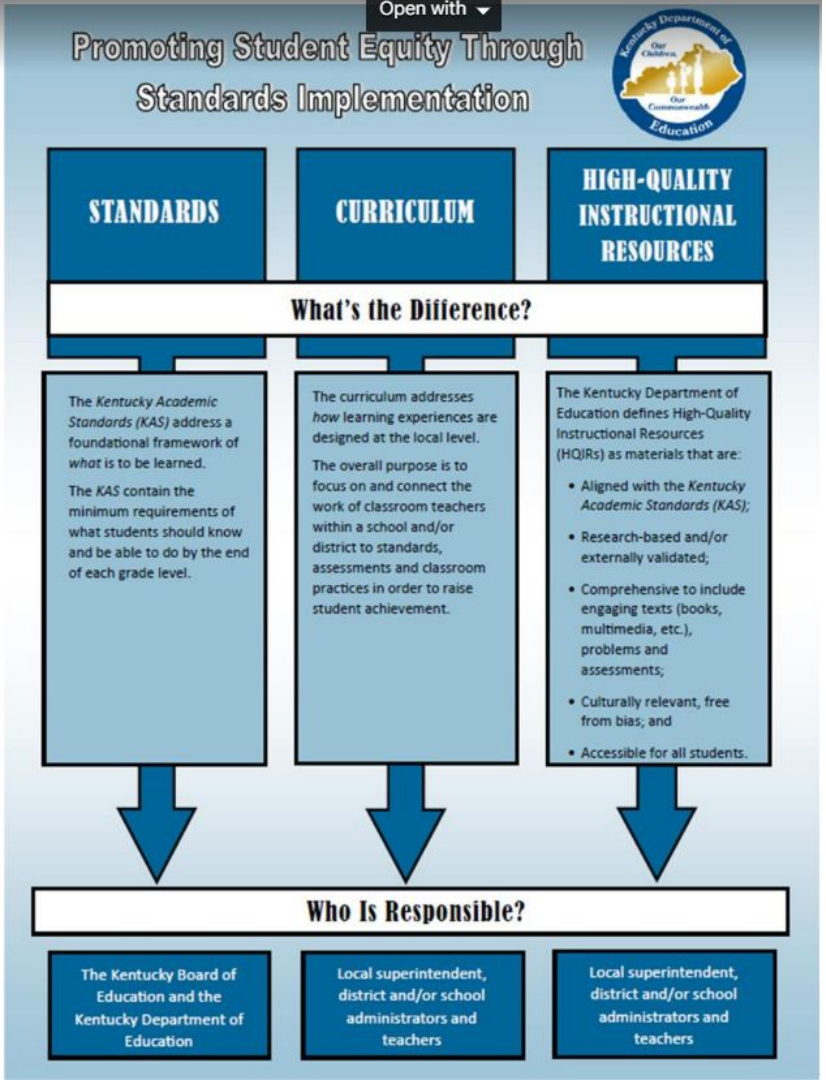
Meeting #2 Information

Meeting #3 Information

Meeting #4 Information

Why Participate?

- District Needs Assessment
- Teacher and principal conversations over the course of the last several years
- Changes in KRS that shifted curriculum decisions away from SBDM to the Superintendent
    - This created a sense of urgency on my part to make sure we have clear resources for our teachers and students
    - I wanted a clear systematic approach that I could use to lead teachers and principals through the process.
- Our teachers are spending lots of time and often their own money on resources
- Do all students K-12 have access to high quality instructional resources?



The first step in creating curricular coherence is to translate the standards into a local curriculum anchored in high-quality instructional resources (HQIRs). While the Kentucky Academic Standards (KAS) establish what students must know and be able to do, the district is responsible for developing a curriculum that addresses how learning experiences are to be designed and for selecting the instructional resources that will assist student learning.

Current research recommends districts adopt and implement a primary HQIR as the print, nonprint or electronic medium designed to assist student learning and support implementation of a high-quality curriculum.

The research shows:

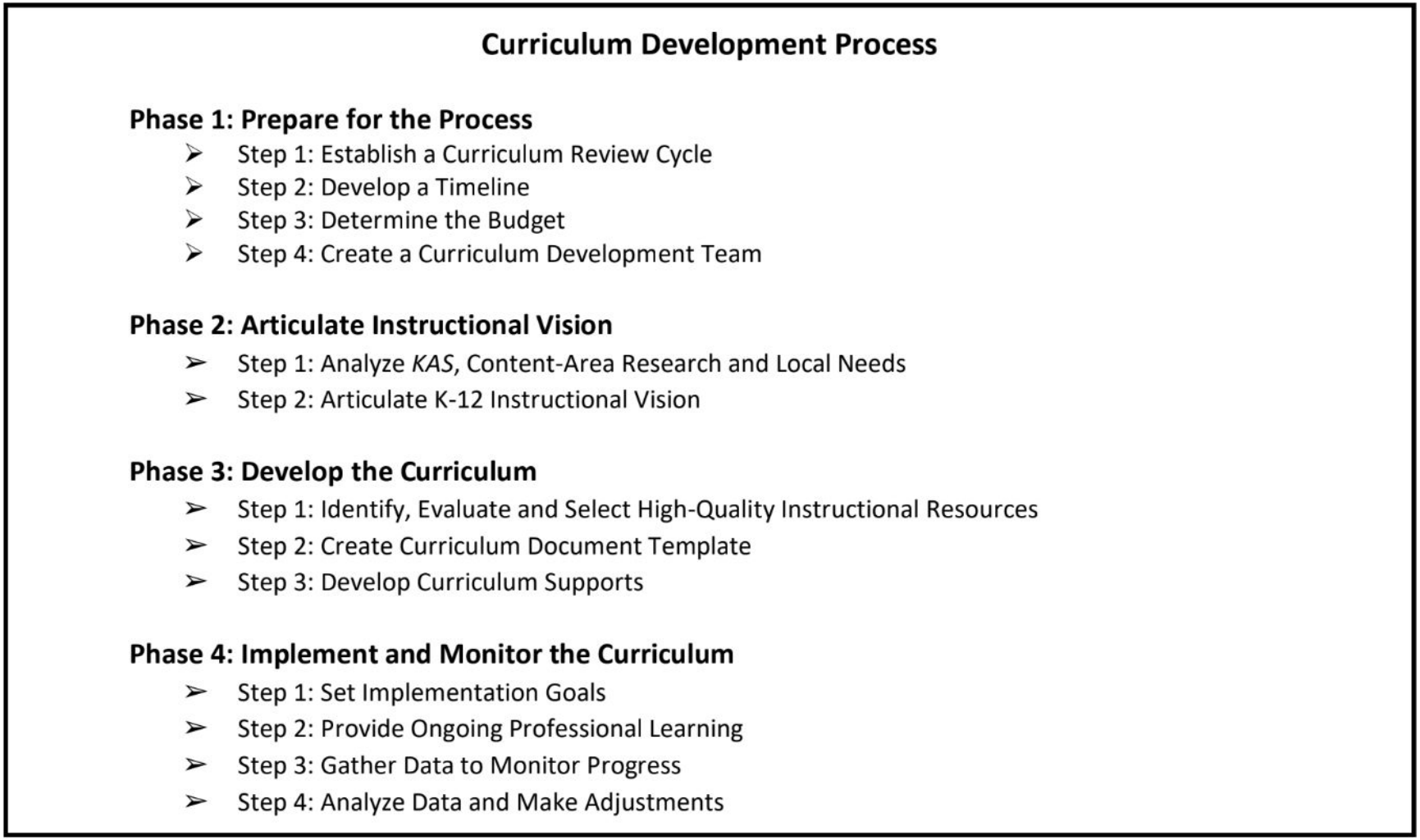
• Aligned to state standards, a HQIR can reduce variability in the quality of instruction across classrooms (SREB, 2017), and students in classrooms that used one HQIR for four consecutive years outpaced comparison students by a margin of 38 percentile points —equivalent to four additional years of learning (Steiner, 2018).

• Teachers creating their own lessons rarely results in a fully sequenced, coherent learning experience over time and across a system (Steiner, 2018), and 75 percent of teacher-created or selected resources are found to be below grade-level (TNTP, 2018).

• Teachers without access to HQIRs spend 7-12 hours per week searching for resources online (Goldberg, 2016).

• Switching from a low to a high-quality instructional resource can boost student achievement more than other, more popular interventions (Steiner, 2018).

Figure 2.1. *The Curriculum Development Process*



K-12 Math Curriculum Team

Team Member	School	Role	Grade Level
Kim Hearne	CCE	Assistant Principal	K-5
Teresa King	CCE	Teacher	K-5
Melinda Richardson	CCE	Teacher	5
Karron Carter	SES	Math Interventionist	K-3
Savannah Creech	SES	Teacher	3
Aubrey Crawford	BES	Math Interventionist	K-3
Darcy Billings-Abney	BES	Teacher	4
Holly Adams	BES	Teacher	2
Ashley Randall	PCMS	Principal	6-8
Brian Linn	PCMS	Assistant Principal	6-8
Dusty Brown	PCMS	Teacher	6-8
Lyndsey Spencer	PCMS	Teacher	6-8
Pam Callahan	PCHS	Teacher	9-12
Cassie Rose	PCHS	Teacher	9-12

Meeting 1 - September 21st- Onboarding event

Onboarding Session Recording
Onboarding Session PPT

Meeting 2 - October 19th- Session 1

Session 1 Video Recording

Session 1 PowerPoint

Next Steps

- Complete the Curriculum Team Structure and Phase 1 of Communication Plan. Please upload those prior to the next meeting into your district's milestone folder located in the CDP Math Pilot Folder..
- Read Phase 2 from the CDP, pages 11-14 and identify the key actions and products of each step of the phase. Once again, we have created a graphic organizer if you would like to use to capture your thinking as you read.

Curriculum Cycle Template

Content Area	Year 1 2019-2020	Year 2 2020-2021 Assessing Gap Due to COVID	Year 3 2021-2022 Assessing Gap Due to COVID	Year 4 2022-2023	Year 5 2023-2024	Year 6 2024-2025
Math	Year 1: Develop	Year 2: Implement & Monitor	Year 3: Monitor & Adjust	Year 4: Curriculum Development Math Pilot	Year 5: Monitor & Adjust	Year 6: Monitor & Plan
English Language Arts	Year 1: Develop	Year 2: Implement & Monitor	Year 3: Monitor & Adjust	Year 4: K-5 Curriculum Development/ HQIR process	Year 5: Monitor & Adjust	Year 6: Monitor & Plan
Social Studies	Year 1: Develop	Year 2: Implement & Monitor	Year 3: Monitor & Adjust	Year 4: Monitor & Adjust	Year 5: Monitor & Adjust	Year 6: Monitor & Plan
Science*	Year 4: Monitor & Adjust	Year 5: Monitor & Adjust		Year 6: Monitor & Plan	Year 3: Monitor & Adjust	Year 4: Monitor & Adjust
PE/Health*	Year 4: Monitor & Adjust	Year 5: Monitor & Adjust	Year 6: Monitor & Plan	Year 1: Develop	Year 2: Implement & Monitor	Year 3: Adjust & Monitor
Visual Performing Arts*						
World Language*						
CTE*						

*These have not been edited or established yet in terms of the cycle template.

Next Steps in Powell County

- **November 8th: K-12 Math Curriculum Team** will meet to finalize the Phase 1 milestones.
- **November 9th:** Pilot school representatives and one representative from each of the other 3 schools will attend the *Vision Setting Session.*
- After this meeting additional information will be communicated to the entire district in a similar format with additional details shared and developed at each school by the school representatives.

Phase 2

Developing the Powell County Schools Math Instructional Vision

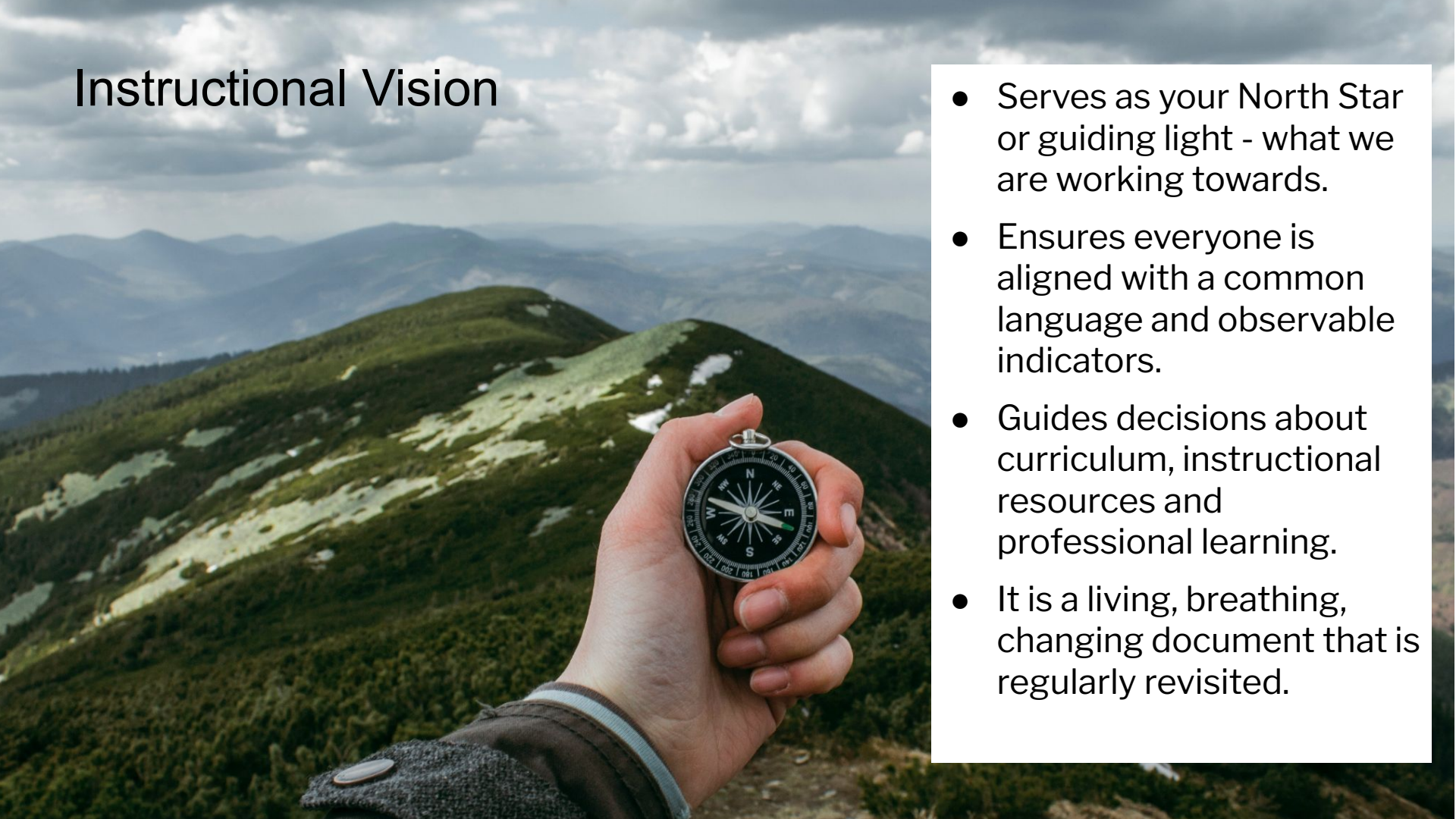
Phase 2: Articulate Instructional Vision

Learning Goal: We are learning about the importance of establishing the shared understandings needed to inform a local instructional vision that guides the curriculum development process.

Success Criteria:

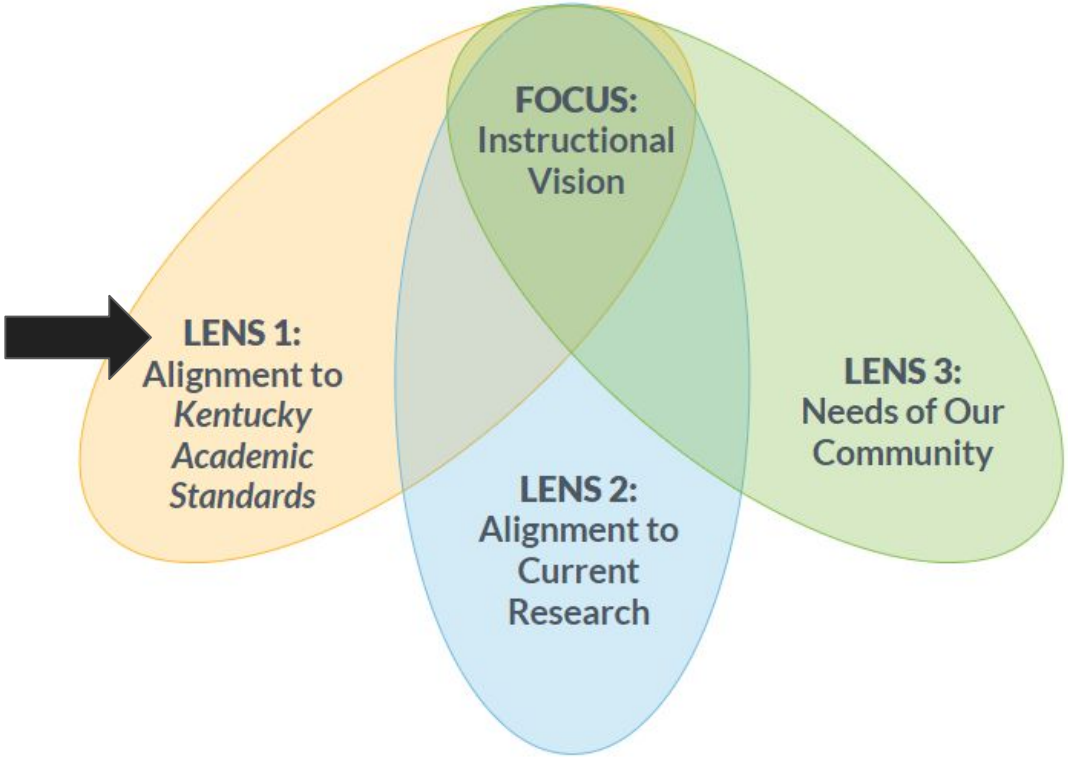
- Identify key actions and products of Phase 2 of the Curriculum Development Process.
- Explain the three lenses of an instructional vision and how to effectively engage them.
- Brainstorm how best to address characteristics of a local instructional vision.
- Begin work on key actions for implementing Phase 2 at the local level.

Instructional Vision



- Serves as your North Star or guiding light - what we are working towards.
- Ensures everyone is aligned with a common language and observable indicators.
- Guides decisions about curriculum, instructional resources and professional learning.
- It is a living, breathing, changing document that is regularly revisited.

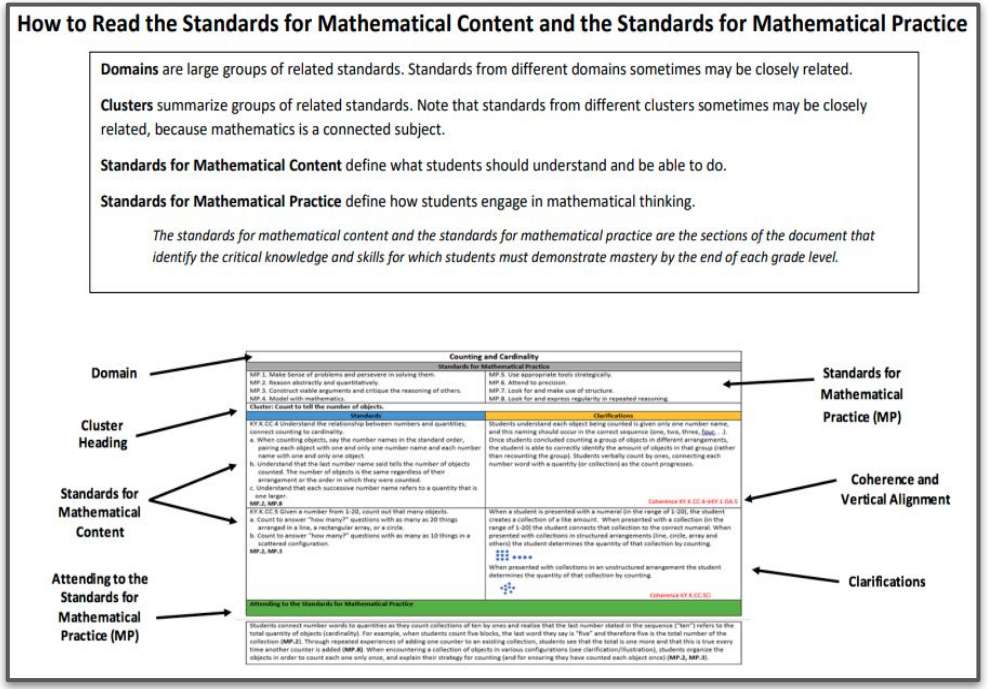
Three Lenses, One Focus



Kentucky Department of EDUCATION

Kentucky Academic Standards for Mathematics

Examining the components of the standards document, what might be some foundational beliefs that led to these components being incorporated in the overall design?



Kentucky Department of EDUCATION

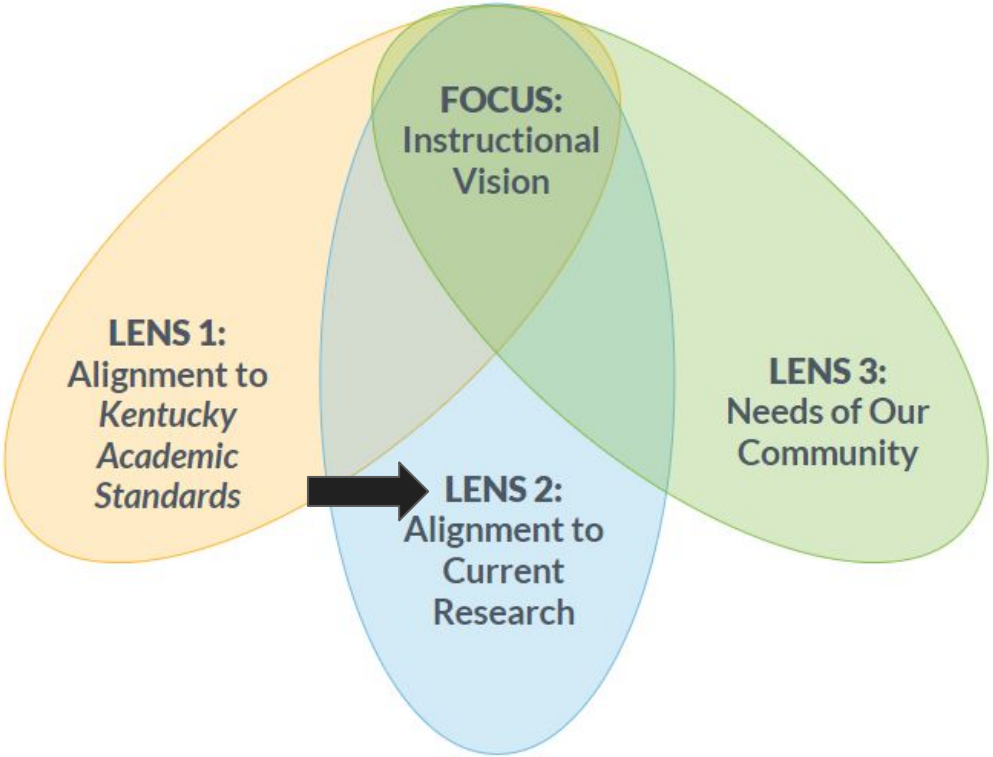
Lens 1: Alignment to Kentucky Academic Standards

Determine 3-5 foundational beliefs built within the KAS for Mathematics.

- Early numeracy skills: if this is not developed early on it will affect their entire education
- Conceptual understanding
- Making connections between conceptual, procedural, and application
- Math practices are HOW we teach the Math Content

Still in progress here…not enough time to fully develop.

Our Approach: Three Lenses, One Focus



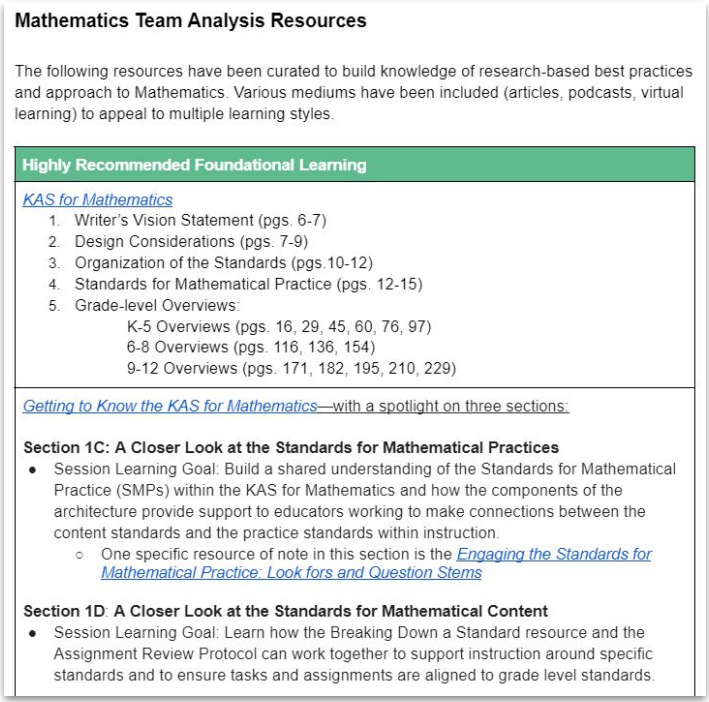
Kentucky Department of EDUCATION

Alignment to Current Research

Explore the resources to get a sense of what is there

Make note of any that you may want to potentially use back in your district

Brainstorm other possible sources of current evidence-based research focused on teaching and learning in math



Mathematics Team Analysis Resources

The following resources have been curated to build knowledge of research-based best practices and approach to Mathematics. Various mediums have been included (articles, podcasts, virtual learning) to appeal to multiple learning styles.

Highly Recommended Foundational Learning

KAS for Mathematics

1. Writer's Vision Statement (pgs. 6-7)
2. Design Considerations (pgs. 7-9)
3. Organization of the Standards (pgs.10-12)
4. Standards for Mathematical Practice (pgs. 12-15)
5. Grade-level Overviews:
   - K-5 Overviews (pgs. 16, 29, 45, 60, 76, 97)
   - 6-8 Overviews (pgs. 116, 136, 154)
   - 9-12 Overviews (pgs. 171, 182, 195, 210, 229)

Getting to Know the KAS for Mathematics—with a spotlight on three sections:

Section 1C: A Closer Look at the Standards for Mathematical Practices

- Session Learning Goal: Build a shared understanding of the Standards for Mathematical Practice (SMPs) within the KAS for Mathematics and how the components of the architecture provide support to educators working to make connections between the content standards and the practice standards within instruction.
  - One specific resource of note in this section is the *Engaging the Standards for Mathematical Practice: Look fors and Question Stems*

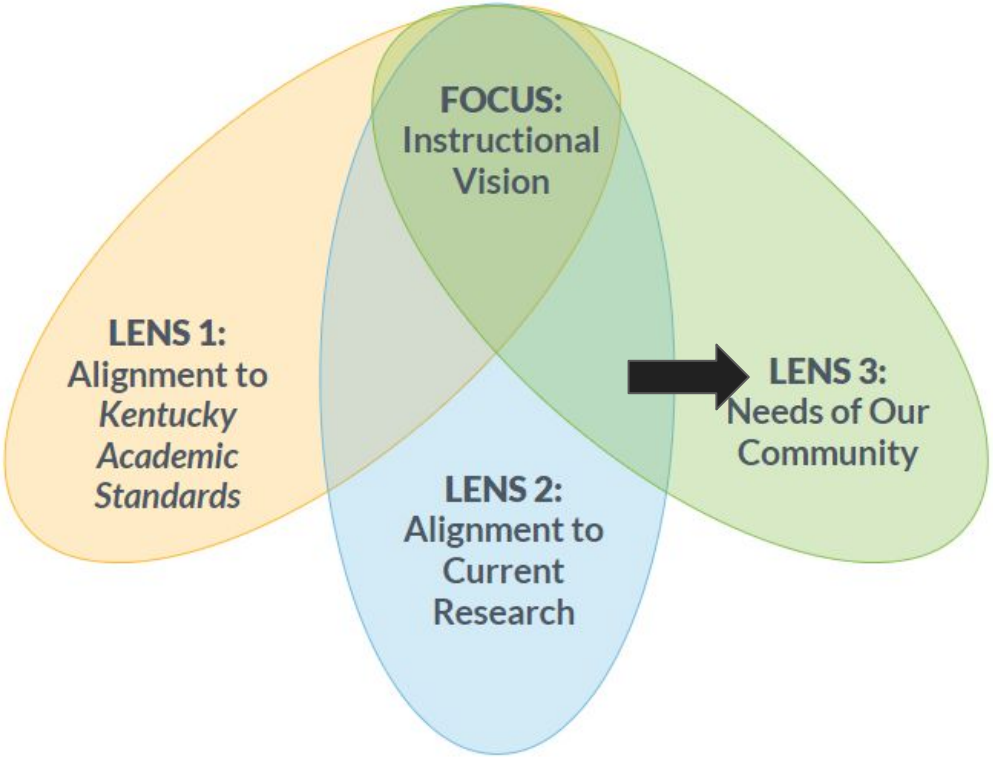
Section 1D: A Closer Look at the Standards for Mathematical Content

- Session Learning Goal: Learn how the Breaking Down a Standard resource and the Assignment Review Protocol can work together to support instruction around specific standards and to ensure tasks and assignments are aligned to grade level standards.

Lens 2: Alignments to Current Research

KDE provided resources of research to utilize in our process.

Our Approach: Three Lenses, One Focus



Kentucky Department of EDUCATION

Lens 3: Needs of our Community

What might be some possible sources of data to help establish the local context?

- School Report Card - demographics, KSA data, Free/Reduced Lunch, IEP
- 22-23 Needs Assessment
- NWEA MAP Growth - Universal Screener Reading & Math
- KYSTATS- understand community statistics
- MTSS Data-sheets
- Learner Profile
- Tier 1 Instructional Model

Reviewing Math Vision Samples

TNTP Math Instructional Vision

KIPP Math Instructional Vision

Carlsbad Vision for Math Instruction

Bossier Final Math Vision

Blackstone Math Instructional Vision

Patterns & Takeaways:

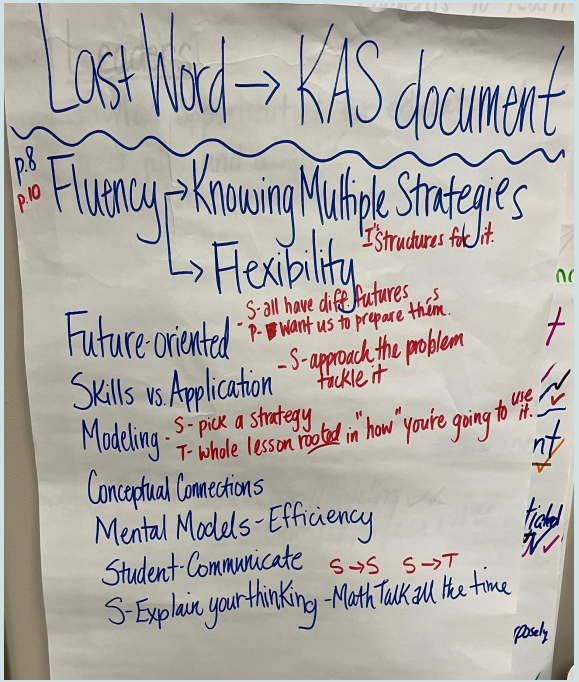
- Defines the actions of each party (Students are…Teachers are…School & District Admin are…Families are…
- Bulleted- Needs to be easy to read-Family friendly language
- Our Learner Profile is throughout these visions- our vision for math must connect (Collaborator, Communicator, Contributor, Critical Thinker)

Next Steps in Powell County

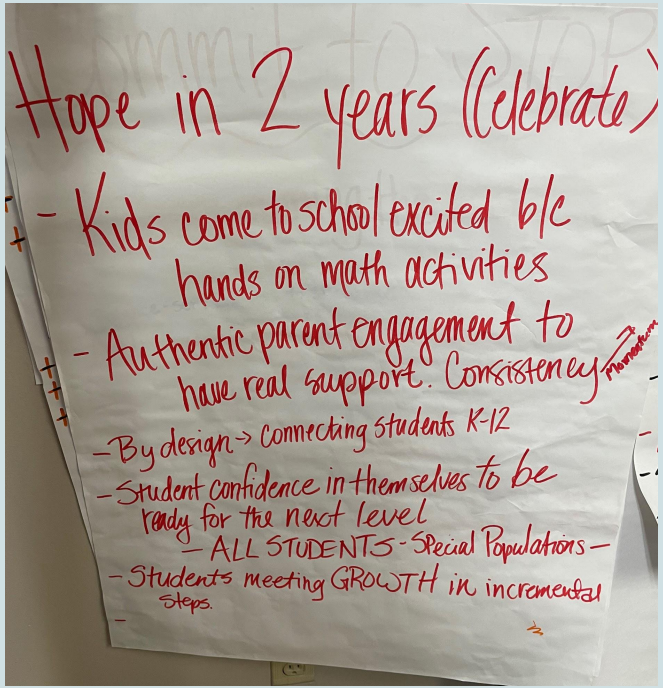
- **December 6th:** District Vision Team Meets to combine our homework and research to start drafting a math instructional vision.
- **December 12th - 16th:** Communicate a *draft math instructional vision* with teachers and parents for feedback.
- **January 2nd:** District Vision Team meets again to review stakeholder feedback and talk about edits.
- Share the updated draft with stakeholders
- **January 19th:** District Vision Team meets with KDE representatives 9:00 - 11:00 (virtual)

District Level Meeting- December 6th

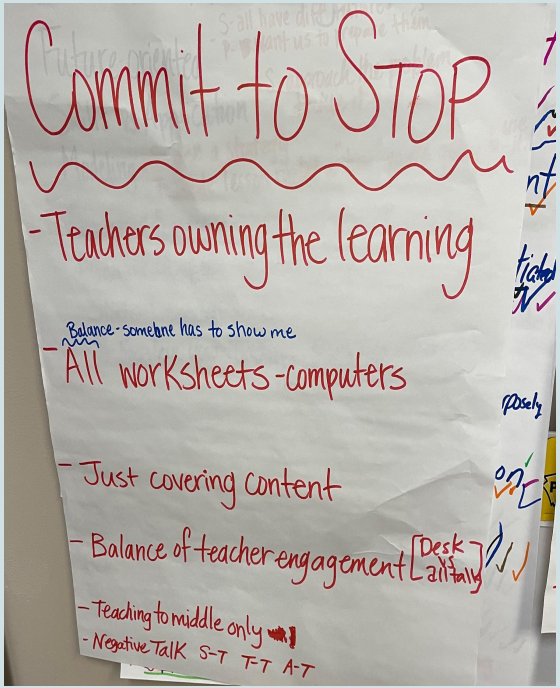
Agenda



Revisit KAS (pp.7-14)

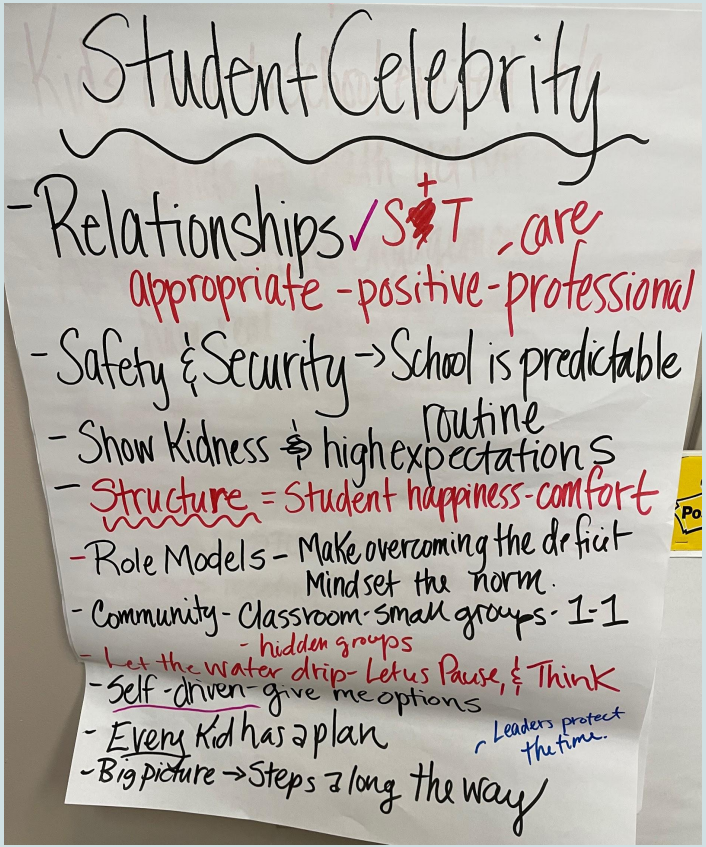


Hope to Celebrate in 2 years



Things we committed to stopping

District Level Meeting- December 6th



We had a Senior participate in an interview and then captured some big takeaways from what he told us was important to students.

We also had a parent that joined us during the interview and contributed to the brainstorming session.

Teacher

* provide a safe and motivating learning environment
* take students from where they are to where they need to be (academically, socially, emotionally)
* actively involved in classroom learning (model, communicate)
* PLC for teachers (curriculum, data, real-world planning)

Student

* Student led (conferences, ownership, pride)
* Active participation in group/individual learning w/ problem-solving
* self-awareness, goal setting

Leaders

* provide instructional coaching
* provide resources for staff
* be actively involved in PLCs w/ teachers

Parents

* are involved in their child's education
* take interests in what their child is learning and how they are learning

Leaders

- provide opportunities for educators to meet, plan, and align
- provide the necessary resources for student success
- be present and provide instructional coaching
- maintain a positive work environment

Students are: (4Cs)

- Collaborating w/ teachers & peers to complete tasks.
- Contributing to the whole class by listening & teaching each other.
- Critical Thinkers that chose appropriate strategies to tackle problems
- Communicating to explain reasoning, ask/guest. to clarify understanding.

Teachers are:

- Create lessons daily w/ structure & purpose.
- Facilitate & model thinking
- Ask questions to promote thinking + flexibility
- Give students time to think + wonder.
- Provide space for positive communication.

Leaders are:

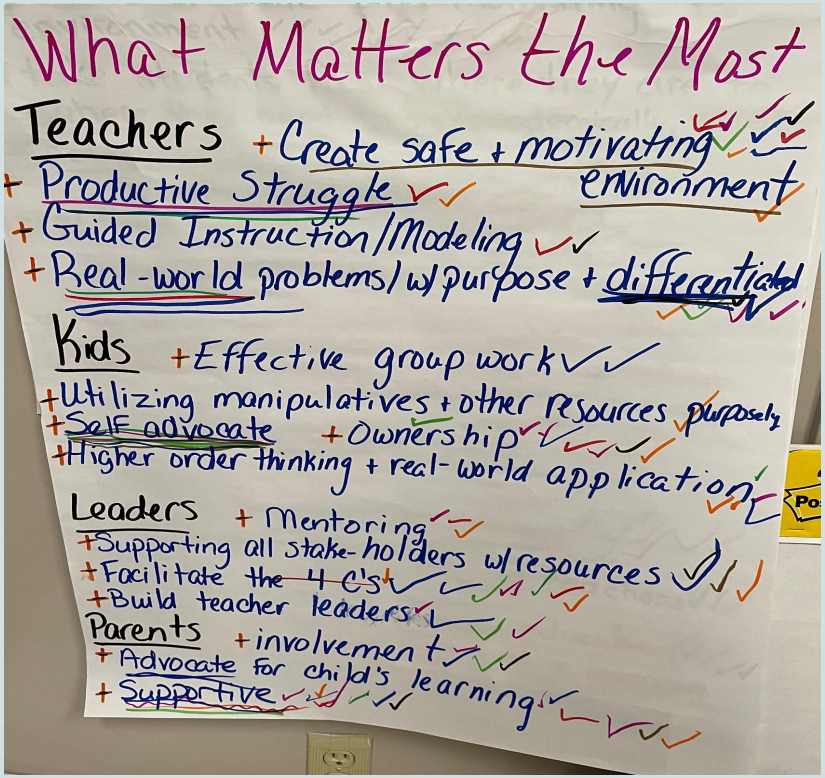
- Supportive and engaged in the classroom!
- Protecting planning time.
- Providing consistency
- Collaborating in PLCs in the planning process

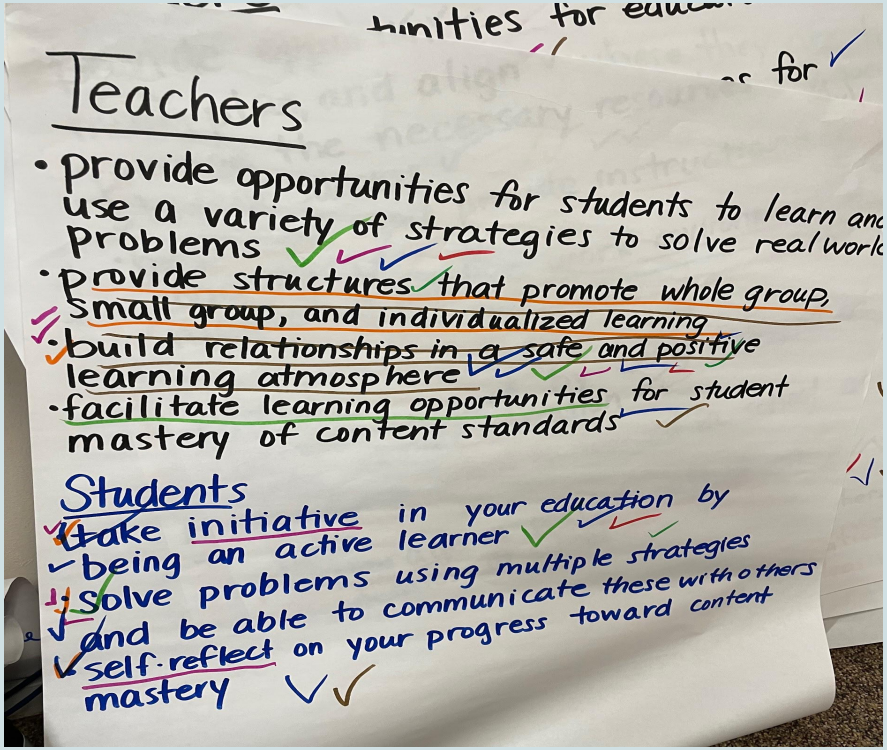
Parents are:

- Active participants in education process
- Encourage positive student Math identity.
- ~~Seek teacher info~~
- Contacting school personnel when questions or concerns come up

Parents

- provide support by being engaged in your child's education
- reinforce what is learned in school at home.
- encourage a positive outlook on academics at school


What Matters the Most
Teachers
+Create safe + motivating environment
+ Productive Struggle
+Guided Instruction/Modeling
+Real-world problems/w/purpose + differentiated
Kids
+Effective group work
+Utilizing manipulatives + other resources purposely
+Self advocate +Ownership
+Higher order thinking + real-world application
Leaders
+ Mentoring
+Supporting all stake-holders w/resources
+Facilitate the 4 C's
+Build teacher leaders
Parents
+involvement
+Advocate for child's learning
+Supportive


Teachers
• provide opportunities for students to learn and use a variety of strategies to solve real world problems
• provide structures that promote whole group, small group, and individualized learning
• build relationships in a safe and positive learning atmosphere
• facilitate learning opportunities for student mastery of content standards
Students
take initiative in your education by being an active learner
solve problems using multiple strategies and be able to communicate these with others
self-reflect on your progress toward content mastery

Still to come

- Our Achievement Network Coach is compiling our Vision Statements to create a one-page math vision.
- We will share with the team for additional feedback and edits.
- We hope to have it to the rest of the district after Christmas Break.

1. Our local Vision for Math

January 19th KDE Meeting
Phase 3 Part 1

Identify, Evaluate and Select High-Quality Instructional Resources

Session 3 PowerPoint
Session 3 Recording (Coming Soon)

Supports for identifying a primary High-Quality Instructional Resource

1. KDE’s General Definition of High-Quality Instructional Resources
2. KDE’s Markers of High-Quality Mathematics Instructional Resources
3. Equity Lenses for High-Quality Mathematics Instructional Resources

KDE's General Definition of HQIRs

- Aligned with the Kentucky Academic Standards (*KAS*);
- Research-based and/or externally validated;
- Comprehensive to include engaging texts (books, multimedia, etc.), problems and assessments;
- Culturally relevant, free from bias; and
- Accessible for all students.

Math Consumer Guide: Markers

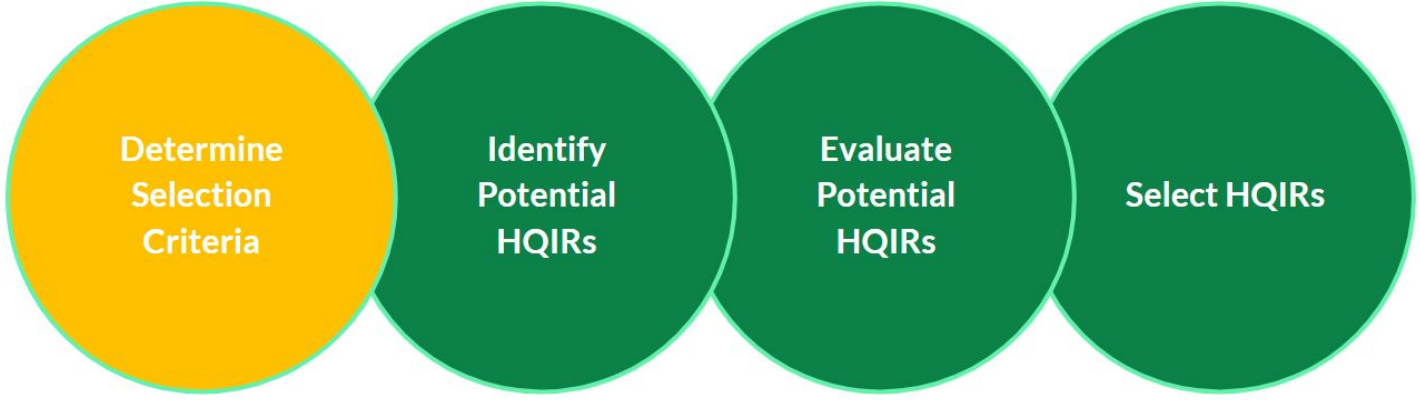
KDE Markers of High-Quality Math Instructional Resources:

- Focus on Grade-Level Content
- Target of the Standard and Cognitive Complexity
- Standards for Mathematical Practice
- Access to Standards for All Learners

Equity Lenses for High-Quality Mathematics Instructional Resources

Lens	**What does this mean?** What does this look like? What is the classroom experience students have when resources fulfill this lens?	**What do we look for in mathematics resources?** *Note: Teacher-facing resources (ex. teacher guides, worked examples, recommended models, and strategies) and student-facing resources (ex. tasks and assessments) are key points of examination in resource selection*
Resources meet the ***high-quality instructional markers*** *laid out in the KDE definition of High-Quality Instructional Resources.*	The KDE has developed a set of criteria for what is considered high-quality as districts examine resources. These provide a strong foundation for resources used in schools and districts throughout the state.	• Aligned with the *Kentucky Academic Standards (KAS)*; • Research-based and/or externally validated; • Comprehensive to include engaging texts (books, multimedia, etc.), problems and assessments; • Culturally relevant, free from bias; and • Accessible for all students.
Resources ***recognize, celebrate and leverage students' cultures and identities and*** *provide opportunities to* ***broaden perspectives by learning about other cultures****.*	Students' cultures are affirmed and included as scaffolds for learning; students' unique strengths (language, culture, neurodiversity, passions) are recognized and celebrated and leveraged. Resources nurture, reinforce, and celebrate students' identities as competent mathematics learners with interesting and worthy ideas to share. Students broaden their perspectives by learning about other cultures; they have opportunities to explore multiple	• Tasks and questions provide opportunities to build from students' cultural experiences to make sense of mathematics • Opportunities to connect vocabulary to students' home languages • Diversity of people featured in mathematical contexts and tasks: Visually diverse, different family structures, different ethnicities and nationalities, neurodiversity, gender, religion • Resources encourage the development of students' identities as competent learners of mathematics ○ Communicate the belief that students' understanding will grow and evolve over time

Local Selection Process



Determine Selection Criteria

Informed by:

- District's Math Instructional Vision
- KDE's Characteristics of High-Quality Mathematics Instructional Resources (Markers/Equity "Look-Fors")
- Stakeholder Input

Next Steps

- **January 24th - 31st:** Parent/Community Survey shared via one-call, text, Facebook

- **January 30th - February 10th:** Student interviews/focus groups and Teacher feedback via PLCs at each school. *Stacy will send questions and information to K-12 Math team/Principals*

- **Monday, February 13th:** K-12 math team will meet for the day to work on compiling the information to determine selection criteria and identify potential HQIRs

Where we are in the process

Curriculum Development Process

Phase 1: Prepare for the Process

- Step 1: Establish a Curriculum Review Cycle
- Step 2: Develop a Timeline
- Step 3: Determine the Budget
- Step 4: Create a Curriculum Development Team

Phase 2: Articulate Instructional Vision

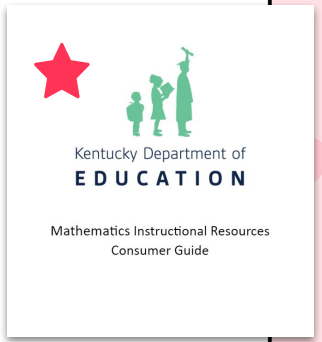
- Step 1: Analyze *KAS*, Content-Area Research and Local Needs
- Step 2: Articulate K-12 Instructional Vision

Phase 3: Develop the Curriculum

- Step 1: Identify, Evaluate and Select High-Quality Instructional Resources
- Step 2: Create Curriculum Document Template
- Step 3: Develop Curriculum Supports

Phase 4: Implement and Monitor the Curriculum

- Step 1: Set Implementation Goals
- Step 2: Provide Ongoing Professional Learning
- Step 3: Gather Data to Monitor Progress
- Step 4: Analyze Data and Make Adjustments



Phase 3-Part 1

Today's Agenda

Purpose
Why do we need HQIR?

The Vision is Set
How does this help us prioritize resource needs?

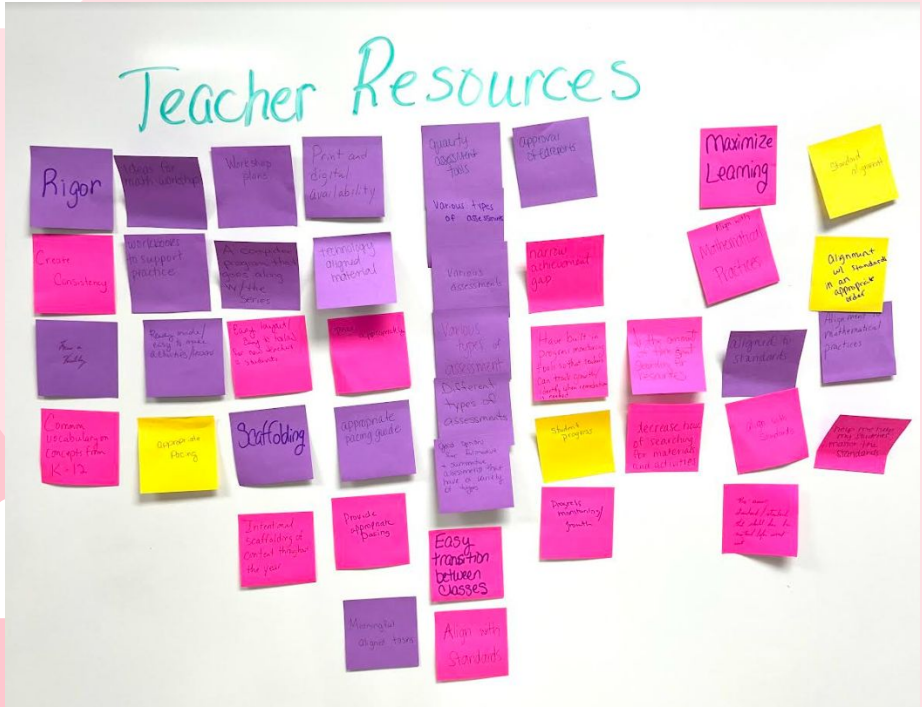
Special Populations
How can we use data to set criteria?

Synthesize
How can we use all of this information to set local criteria?

Stakeholder Voices
What do students, teachers, and parents need?

KDE-EdReports
How do local and state priorities impact our decisions?

Narrow Ideas: Teacher Resources



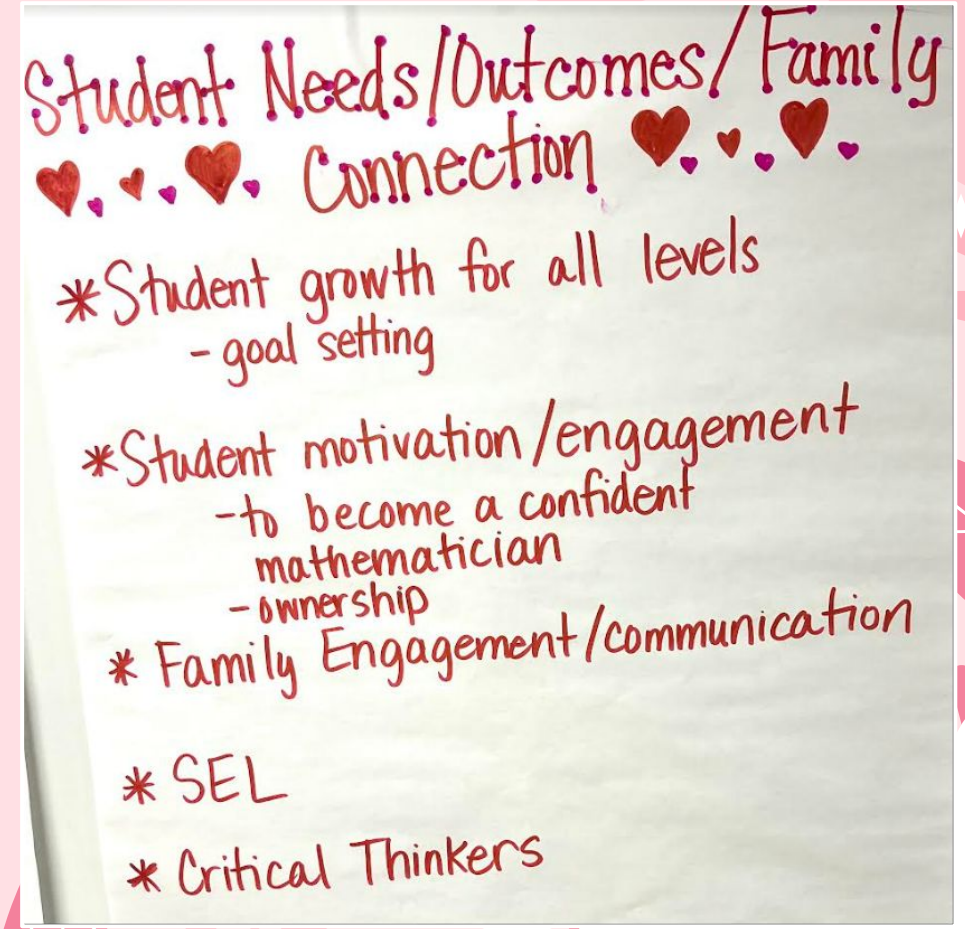
Teacher Resources

- Varied quality assessments and tasks
- aligned With Standards and Mathematical practices
- appropriate Pacing
- easy to use and follow

Narrow Ideas:
Instructional Practices

Narrow Ideas:

Student Needs & Family Connection



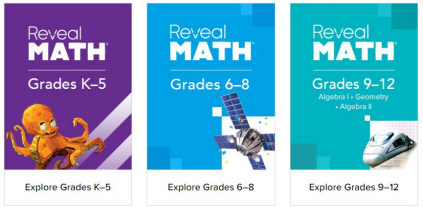
High Quality Instructional Resources Selected for review

Elementary Resources

iReady

Curriculum Associates | i-Ready

Reveal



enVision

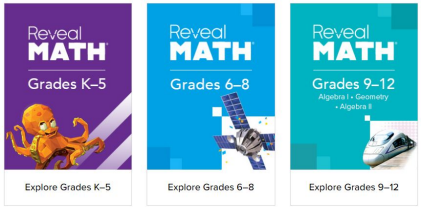
Illustrative Math

Middle School Resources

iReady

Curriculum Associates | i-Ready

Reveal



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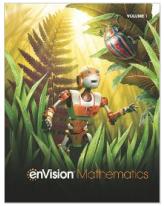
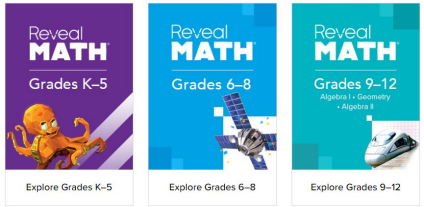


Illustrative Math

Carnegie Math

High School Resources

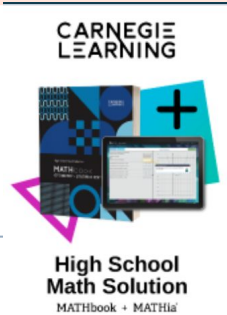
Reveal



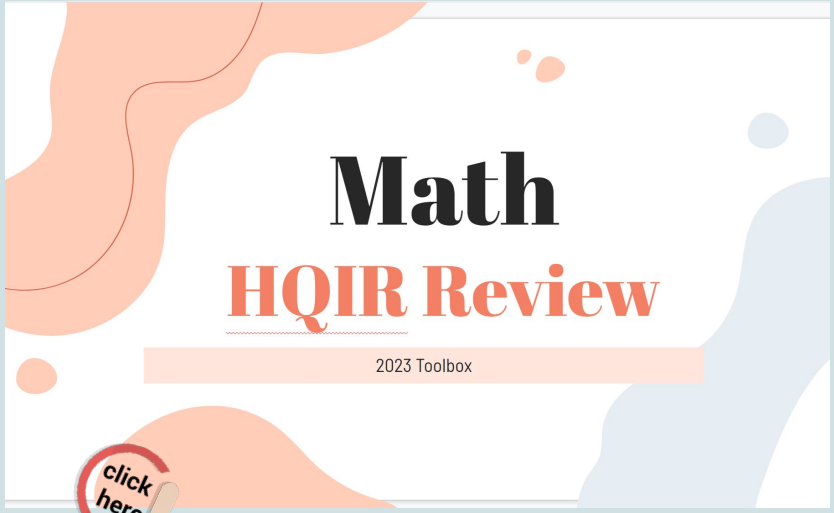
enVision

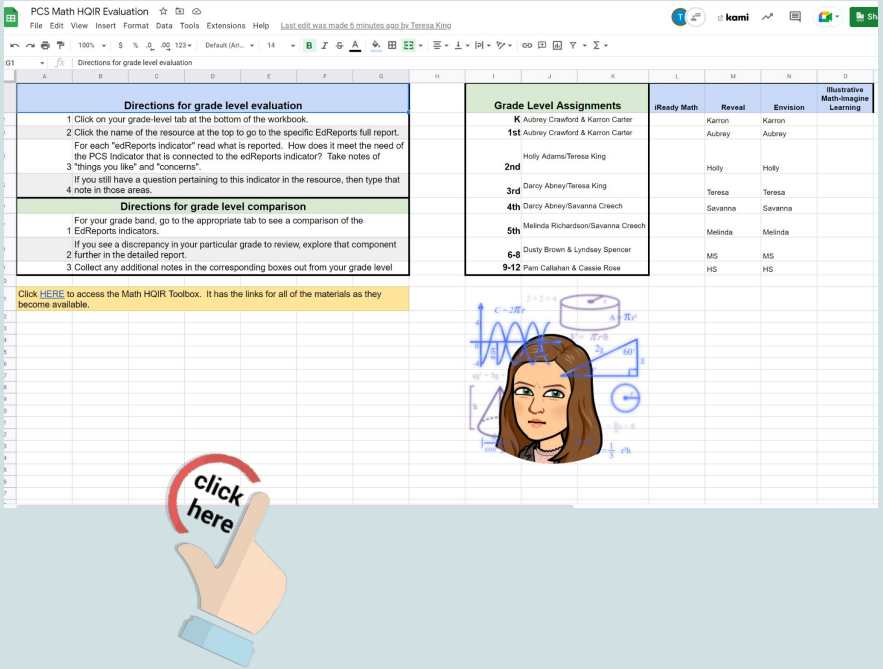
Illustrative Math

Carnegie Math



Phase 3-Part 1





KDE Session 4
Phase 3, Steps 2 & 3
February 22nd Meeting
Video Recording
Powerpoint

Math HQIR Vendor Questions

1. What specific evidence can you provide that your instructional resource strongly aligns with our district's instructional vision?
2. What specific evidence can you provide that your instructional resource strongly aligns to the content standards, the practice standards and the cognitive demands of the *Kentucky Academic Standards* for *Mathematics*? Specifically:
    a. What evidence-based instructional practices are included in your resources and approach to support teachers with implementing instruction aligned to the target of the standard (conceptual understanding, procedural skill/fluency, application)?
    b. Looking across grades/courses, how do your resources explicitly support making coherent connections to the same topic in a previous grade/course? If so, are the resources crafted to elicit a more sophisticated level of understanding than would have been acceptable in the previous grade/course? How do the resources explicitly support making coherent connections to other standards within the grade/course?
    c. How do your resources feature an appropriate balance of cognitive complexity across the student learning experiences (conceptual understanding, procedural skill/fluency, application)?
    d. How do your resources explicitly require students to engage in the Standards for Mathematical Practice? How do the content and practices support each other throughout the instructional resource?
    e. How do your resources give students an authentic opportunity to connect content standards to real-world issues and/or contexts?
3. How does the instructional resource support teachers in offering students opportunities to make decisions about how to improve as opposed to a way to determine if answers are right or wrong?
4. What pedagogical supports (evidence-based instructional practices, etc.) will help teachers deliver instruction that enables students to engage in tasks that promote problem solving and reasoning?
5. What specific evidence can you provide that your instructional resource supports classroom application by being accessible and usable for educators and supportive and challenging for all students, including those learning English, those with various disabilities and/or talents, and those working below and/or above grade level?
6. How does the instructional resource provide supports for families (i.e.strategies for informing all families about the resource, suggestions for how families can support

Next Steps

- Phone calls and demonstrations scheduled with the publishing companies to answer specific questions pertaining to our local criteria and expectations.
- **Tuesday, March 14th:** Parent Session to review materials
- **March 6th - 17th:** Information regarding review of materials shared with PLCs and SBDM
- **Thursday, March 23rd*:** K-12 Math Team meeting to finalize HQIR selection and begin work on curriculum template