Kentucky Department of EDUCATION

Kentucky Academic Standards (KAS) for Mathematics

Resources to Support Implementation

I want to ensure the instruction within my classroom/school/district is grounded in the *KAS for Mathematics.* What resources are essential to developing clarity around the grade-level expectations within the *KAS for Mathematics*?

Getting to Know the KAS for Mathematics Module – Updated December 2021!

Designed to support educators in grounding instruction, the Getting to Know the *KAS for Mathematics* module starts with familiarizing educators with the architecture of the standards before taking a deeper look at the Standards for Mathematical Practice (SMPs/MPs), the Standards for Mathematical Content and the Coherence/Vertical Alignment. Included are a Facilitator's Guide that provides suggestions for structuring each learning session, recommended Discovery Tasks to prompt meaningful investigation of the *KAS for Mathematics* and guidance on talking points to use with the provided PowerPoint. The module has been updated to include resources developed since the initial release and virtual alternatives for many of the Discovery Tasks.

Breaking Down a Standard Resource

Designed to mirror the architecture of the *KAS for Mathematics,* the Breaking Down a Mathematics Standard resource supports clarity by guiding educators to look deeply at:

- the components of the architecture of the standards, contributing to a holistic understanding of the *KAS for Mathematics*
- the instructional implications resulting from that exploration, including the impact on student learning.

Annotated samples are made available for each grade level (K-8) and each conceptual category at the high school level.

Engaging the SMPs: Look Fors & Questions Stems

As a supplement to the *KAS for Mathematics*, the Engaging the SMPs resource provides guidance on ways teachers can design instruction to allow students to engage in the standards for mathematical practices. Engaging the SMPs resource includes Student Look-fors, Teacher Look-fors and potential Question Stems for each of the eight mathematical practices. This resource is included in Section 1C: A Closer Look at the Standards for Mathematical Practice (mentioned above in the Getting to Know the *KAS for Mathematics* module) for those interested in a deeper exploration of the SMPs.

I want to ensure the instructional resources utilized within my classroom/school/district are aligned to the *KAS for Mathematics.* What supports can guide educators through the process of reviewing instructional resources to ensure students have access to grade-level standards, considering how to modify or supplement existing instructional resources when needed?

Mathematics Assignment Review Protocol

A protocol intended to help teachers, leaders, and other stakeholders answer the question, "Does this task give students the opportunity to meaningfully engage in worthwhile grade-appropriate content?" **Note:** This protocol is designed to guide participants through the process of reviewing a **single task/assignment** by examining the alignment with the Mathematical Content alignment, engagement in the Mathematical Practices, attention to Relevance and analyzing Student Performance.

Grade Level Samples: Breaking Down a Standard and Assignment Review Protocol

This resource library provides guidance on how teachers seeking clarity around a standard might utilize the Breaking Down a Standard resource and the Assignment Review Protocol collectively to deepen understanding of the standard. When assignments and tasks are of poor quality and/or do not match the intended learning outcomes in both content and cognitive level, the lesson will not provide appropriate evidence of student thinking and cannot be used to measure progress towards learning goals. Section 1D: A Closer Look at the Standards for Mathematical Content (Getting to Know the *KAS for Mathematics* module) has been modified to guide educators through using this resource library. **Annotated samples are made available for each grade level (K-8) and each conceptual category at the high school level.**

Student Assignment Library

The Student Assignment Library provides examples of student tasks that are weakly, partially and strongly aligned to standards. The sample assignments can be used with the Assignment Review Protocol to develop a better understanding of the tool and how it can be applied to a teacher's own work. Section 1D: A Closer Look at the Standards for Mathematical Content (mentioned above in the Getting to Know the *KAS for Mathematics* module) includes a Discovery Task utilizing the Student Assignment Library within the Opportunities for Extended Learning.

Mathematics Instructional Resources Alignment Rubric

The purpose of this resource is to guide districts and schools through the process of reviewing a **comprehensive program**. Utilizing this tool will support schools/districts in identifying any gaps that may exist when trying to align current/potential curriculum to the *KAS for Mathematics*, allowing schools/districts to supplement where necessary.

I want to ensure the instructional practices utilized within my classroom/school/district are grounded in evidence-based instructional practices. What resources promote the use of evidence-based instructional practices by making direct connections to what those practices look like "in practice" when instruction is grounded in the *KAS for Mathematics*?

Integrating Social, Emotional and Academic Development (SEAD) within the *KAS for Mathematics*

The focus of *Integrating SEAD within the KAS for Mathematics* is to highlight authentic opportunities for mathematics educators to interweave the development of social emotional competencies with the development of mathematics content. Each grade-level resource includes:

- Connections between the social and emotional competencies established by the Collaborative for Academic, Social and Emotional Learning and the expectations set within the *KAS for Mathematics*
- Design considerations and specific examples of what integrating SEAD might look like within the specific grade level;

- Questions to empower teachers to self-reflect on ways to integrate SEAD within effective mathematics instruction; and
- Questions teachers can use with students to encourage SEAD while also engaging students with the SMPs.

Guidance to support those engaging in this work at the local level is contained within an overview video providing an orientation to all the components, a facilitation considerations resource and a reflection sheet is provided to support educators in processing new learning and reflecting on instructional implications.

Evidence-Based Instructional Practices Series

The focus of this professional learning series is to deepen educators' understanding of the six Evidence-Based Instructional Practices and to examine how these strategies can support students in reaching the intended learning outcomes within the *KAS for Mathematics*.

- Establishing the Learning Environment and the *KAS for Mathematics*
- Clarifying and Sharing Clear Learning Goals and the *KAS for Mathematics*
- Explicit Teaching and Modeling and the *KAS for Mathematics*
- Discussion and the *KAS for Mathematics*
- Questioning and the *KAS for Mathematics*
- Meaningful Feedback and the *KAS for Mathematics*

The Facilitation Considerations resource posted alongside each practice contains suggested strategies to engage participants in discussions around the given practice and possible reflection questions facilitators may use to help participants process their learning and begin to think about next steps.

Building a Culture of Math Learning [K-12] Professional Learning Experience

Effective teaching of mathematics requires cultivating a culture of math learning within the classroom, encouraging students to take academic risks, to persevere when content becomes challenging, to utilize a myriad of mathematical tools and models to approach new problems, to share their own thinking and to offer feedback on the thinking of others. To cultivate this kind of culture, educators must model the importance of grappling with content to build a deep understanding; they must equip students with the content knowledge and problem solving tools to find multiple pathways to a given solution; and they must facilitate regular opportunities for students to engage in the practices of mathematics. Developed through a partnership between the KDE and Leading Educators, these learning experiences will allow educators to explore instructional moves and connect them directly to the mathematical content and practices within the *KAS for Mathematics*. Each Learning Cycle includes a shared learning session, a planning and practice session and a student progress monitoring session.

I want to ensure my instructional planning considers how to organize and sequence all grade-level expectations within the *KAS for Mathematics*. What resources can support reviewing specific course standards with a focus on organizing standards together in a way that can anchor student learning?

Section 1E: A Closer Look at the Coherence/Vertical Alignment (mentioned above in the Getting to Know the *KAS for Mathematics* module) includes the Discovery Task: Coherence Card Sort can be a great resource for individuals/schools/districts to utilize as they engage in the work of organizing and sequencing local curricula.

Mathematics Course Standards documents

Once individuals/schools/districts have reviewed instructional resources for alignment to the *KAS for Mathematics*, including identifying any gaps that might exist or any content listed off grade level, the organization of the mathematics courses, particularly at the high school level, may require revision to fully meet the expectations of the *KAS for Mathematics*. These documents provide information on the available mathematics course codes offered by the KDE.

High School Mathematics Matrix Standards by Course 19-20 and Beyond

The purpose of this document is to provide guidance for educators working to align high school courses to the *KAS for Mathematics*. There is no guidance provided in this document for local curriculum decision-making on how the "Additional Required Standards" will be addressed.

I want to ensure I engage families as partners in the learning within my classroom/school/district. What resources can help encourage families to join in learning mathematics alongside students, empowering them as advocates and inviting them to engage in the mathematics around them every day?

Standards Family Guides

The *KAS Family Guides* (available in English and Spanish) have been developed to help families familiarize themselves with the content of each grade level's standards. Each guide contains a standards overview for Reading & Writing, Mathematics, Science and Social Studies, along with sections devoted to Examples of Your Child's Work at School, How to Help Your Child at Home, Questions You Can Ask Your Child and Questions You Can Ask Your Child's Teacher for each of the content areas. **Written for families,** educators might consider sharing this resource prior to family engagement events to equip families as partners in offering to help students move learning forward.

A Family's Guide to Understanding Student Assessment

This guide was made to help families understand how assessment can support student learning. You will find information about different types of assessment your student might engage in and how each can help your student meet learning goals. This guide includes questions that you can ask your student and their teacher to help you support learning at home. When teachers and families work together, students can develop the skills they will need for life after graduation. **Written for families,** educators might consider sharing this resource prior to family engagement events to equip families as partners in offering to help students move learning forward.

Kentucky Family Math Night Resources

The Kentucky Family Math Night Resources have been developed through a partnership among the Kentucky Department of Education (KDE), Regional Educational Laboratory (REL) Appalachia, the Kentucky Center for Mathematics (KCM) and the Kentucky Collaborative for Families and Schools. The resource includes guidance on talking to families about mathematics and includes activities designed to engage a community in learning mathematics.

Summer Support: Kentucky Family Math Games

The Kentucky Family Math Games webpage is a collection of simple, yet engaging games families can play over and over again at home to build mathematical thinking. To help families know which games may be more appropriate for their aged child, they are organized by grade level bands.