KUWL Council

Algebra 1 Math Badging Initiative

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Kentucky Steering Committee

Kentucky Dept. of Education

    Dr. Robin Hyden Ed.D., Program Consultant and Math Badging Project Lead

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    Maggie Doyle, Division of Program Standards

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    Kelly DeLong, Executive Director

District Leaders

    Dr. Jennifer Fraley Ed.D., Director of District Programs *Carter County*

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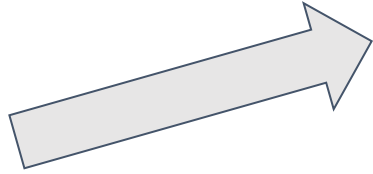
District Committee Members

When Kentuckians told us what they wanted...
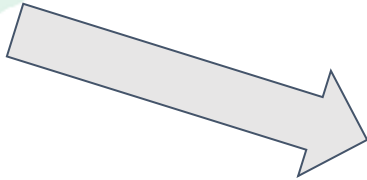
Create more vibrant learning experiences for every student

Encourage innovation in our schools - especially when it comes to assessment

Create a bold new future for Kentucky's schools through collaboration with communities

UNITED WE LEARN

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Our Theory of Action

If...	Then...	Then...	Then...
Kentucky develops a mastery-based math badging system,	First-year students will have the opportunity to earn math badges in Algebra I,	Students will be able to attain the Algebra I graduation requirement at an individualized pace, and	Students will be able to craft individualized pathways through high school.

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Where We Are:

Phase 1: Planning *July 2022 —>*	Phase 2: Preparation *September 2022 - July 2023*	Phase 3: Implementation *August 2023 - May 2024*
Math Advisory Subcommittee will form and align math badges to Kentucky Academic Standards	Pilot districts aligns curriculum and assessment to the math badges with support from KDE, KCM, and XQ partners	Students enroll in badge-aligned Algebra I courses and earn credentials during the school year Ongoing feedback loops to share learning from pilot classrooms/schools

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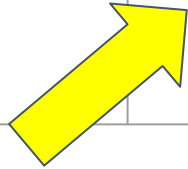
Algebra I Required Badges

M 101 Linear Equations: Concepts and Skill

M 102 Modeling with Linear Functions and Equations

M 103 Modeling with Functions of Quadratic Type

M 104 Modeling with Functions of Exponential Type

M 111 Modeling with Data: One-Variable Measurement Data

M 112 Modeling with Data: Two-Variable Measurement Data

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Encourage innovation in our schools- especially when it comes to assessment

- Portfolio of Evidence

- Concepts and Skills Assessment

- Performance Assessment

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Portfolio of Evidence

The portfolio of evidence is a set of artifacts collected throughout the students' interactions with the badge content through their learning experiences. Students are given agency to choose artifacts that make them proud and allow them to demonstrate their learning through multiple modalities. This provides students with a voice and reflects the mindsets and habits of professionals who use mathematics in their work. Students are given the opportunity to showcase evidence of their own learning through the work they have done.

The process for artifact collection generally follows these steps:
- Once criteria/indicators have been shared with students, they start collecting evidence of learning in their earliest learning experiences, with a goal toward earning the badge.
- Students are taught to select work matching the indicators, that they are proud of, and to express why they have selected it.
- After students make a selection, they engage in a reflective process related to their learning, where they construct a portfolio over time. Each selection the student makes will include the following portfolio components:
  a. Description of the artifact and why it was selected.
  b. The artifact itself.
  c. A reflection of how the artifact demonstrates the indicators.
  d. Potential future learnings they hope to have on the topic or related to specific concepts in mathematics.

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Concepts and Skills Assessment

Badge assessments are criterion referenced. The purpose of the assessment is to support the determination of whether a student has earned the badge. Its purpose is not to compare students to each other. Discrimination is not information, but comparison to criteria is. The use of the IRT test methodology does not fit the purposes of badge assessment. If 100% of students accomplish what is expected, the assessment should award badges to 100% of students.

Minimize false negatives. Items on a badge exam assessing concepts and skills should minimize construct-irrelevant difficulties. Assessments should include easy items that provide the evidence stipulated in the blueprint. Items should not go beyond the blueprint evidence stipulations by incorporating excessive complexity, miscues, messy numbers, inconsiderate wording, unfamiliar prompting, or other demands that increase the probability of execution errors for a student who understands the concept or holds the skill.

Provide sufficient time. There should be ample time for all students. How fast one works is not being assessed.

Allow students to re-take the assessment. Teachers should be able to use information from the score report to design additional learning.

Provide opportunities for revision. Responses that do not meet success criteria must be revised. Students will receive feedback on their work, including what was good and what went wrong. They will have the opportunity to confer—e.g., ask questions and get answers that stop short of answering the item.

Revision credit is full credit. Students will get full credit toward the badge for revisions that meet the standard.

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Performance Assessment

The performance assessment provides students with the opportunity to show evidence of their learning specific to the particulars of badges that center mathematical modeling and application, allowing them authentic ways to demonstrate their ability to apply transferable and real-world skills. For modeling badges, students will complete the full modeling cycle grounded in engaging and meaningful context(s) and report their conclusions using modes and means that are well suited to the overall purpose of the task and that allow for some agency. The following criteria are offered for designing high-quality performance assessments (Safir & Dugan, 2021):

1. Elicits evidence of skills and knowledge matter.
2. Is tight on quality criteria while open to different approaches.
3. Is authentic.
4. Offers a learning experience in and of itself.

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Reimagining how we credential learning:

"I'm always learning, formally and informally, and I apply that knowledge daily. Micro-credentials give me recognition for that learning." - Digital Promise Educator

Micro-credentials and Badging

- Granted based on demonstrated skills and competencies (performance-based)

- Allows for flexibility of pacing based on a learners need for acceleration and remediation

- Gives opportunities for multiple attempts at mastery

- Focused on specific skills and more connected to standards

- Improves student ownership of their own learning and encourages lifelong learning

- Reduces risk of course failure and recognizes student accomplishments

- Widely used in higher education and the workforce

Improve math outcomes and advance equity through:

- Stronger **alignment** to math needed for secondary, postsecondary, and career success

- Students **demonstrate knowledge** not captured by grades

- Opportunities to **develop and reinforce** math knowledge and skills

- **Validate learning** outside of the classroom through work-based and other applied learning.

- **Customization** engages students with math directly related to college and career interests

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Questions & Comments

For more information:

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