



Kentucky Department of

***Our
Children,***

***Our
Commonwealth***

Education

Professional Learning Module for Newly Adopted *Kentucky Academic Standards for Mathematics*

Webcast
May 2, 2019



Getting to Know the Kentucky Academic Standards for Mathematics:

► Module 1:

- Section A: Revision Process Overview
- Section B: Understanding the Architecture
- Section C: A Closer Look at the Standards for Mathematical Practice
- Section D: A Closer Look at the Standards for Mathematical Content
- Section E: Spotlight: Clarifications & Coherence
- Section F: Spotlight: Front Matter & Appendix A
- Section G: Wrap Up & Next Steps





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The goal of health education and physical education is to provide Kentucky students



Mathematics

KY Academic Standards

The K-12 mathematics standards were designed for students to become mathematically proficient. By aligning to



Reading & Writing

KY Academic Standards

Preparation of Kentucky's students for the demands of the 21st Century requires districts and schools to prepare every



Mathematics

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- [Kentucky Academic Standards for Mathematics](#) (Click or Tap to Download)
- [Math Standards - Critical Fact Sheet](#) (Click or Tap to Download)



With new revised Kentucky Academic Standards (KAS) there is a need to dive into the standards and discuss instructional implications. Kentucky Department of Education staff is kicking off a professional learning series, complete with companion resources to assist districts with planning and implementation of improved practice and strong instruction around these newly revised standards. See below for resources and click or tap the + to expand the content area.

+ KAS Leadership March Meetings Resources

— Mathematics

 [Facilitator's Guide: Getting to Know the KAS for Mathematics](#) (Click or Tap to Download)

 [Getting to Know Your KAS for Mathematics](#) (Click or Tap to Download)

 [Module 1: At a Glance Mathematics](#)

+ Reading & Writing

+ Standards Rollout Webcasts

Design of Module 1:

- Meant to be utilized **before** standards alignment and curriculum work in order to build knowledge and capacity around the standards and to capitalize on the opportunity to improve teaching and learning
- Contains 7 sections: Each section of module 1 is designed to be administered in a 45 minute PLC session; however, the timeline and work sessions can be adjusted to best fit the needs of schools and districts.
- Module facilitators may include, but are not limited to, district leaders, school administrators, instructional specialists/coaches, department chairs, and/or teacher leaders. With that in mind, the facilitator notes include content information and instructional support intended to provide support to a facilitator who may or may not have an extensive background in mathematics.



Contents:

Module Overview:

- Goals

- Intended Audiences

Using this Facilitator's Guide

- Planning Ahead

- Preparation

- Work Session Suggestion

Module 1: Getting to Know the *Kentucky Academic Standards for Mathematics*:

- Section 1A: Revision Process Overview

- Section 1B: Understanding the Architecture

- Section 1C: A Closer Look: Standards for Mathematical Practice

- Section 1D: A Closer Look: Standards for Mathematical Content

- Section 1E: Spotlight: Clarifications & Coherence

- Section 1F: Spotlight: Front Matter & Appendices

- Section 1G: Wrap up & Next Steps

Module Overview:

The *Getting to Know the Kentucky Academic Standards for Mathematics* Module, developed by the Kentucky Department of Education (KDE), contains the materials to be used in work sessions at the district, school, or department level. These sessions are intended to support the successful transition to and implementation of the *Kentucky Academic Standards (KAS) for Mathematics* in classrooms across the state.

The duration, scope and sequence of the sections may be customized to accommodate local needs and conditions. The sections are designed to provide flexibility for districts and schools and, as such, can be viewed as standalone lessons or within the progression of the module as written.

Materials:

The following materials are part of this module:

- *Getting to Know the KAS for Mathematics Facilitator's Guide*
- *Getting to Know the KAS for Mathematics Participant Guides*
- *Getting to Know the KAS for Mathematics Handouts*
- *Getting to Know the KAS for Mathematics* slide presentation

All materials are available on the KDE website at kystandards.org

Goals:

The goals of the *Getting to Know your KAS for Mathematics* Module are for districts or schools to:

- Build a shared understanding of the *KAS for Mathematics* document.
- Strengthen the connection between the components of the *KAS for Mathematics* and the way those components can support educators in the process of designing instruction.
- Experience how the changes in the *KAS for Mathematics* can and will be reflected in student experiences within Kentucky classrooms.
- Identify and prioritize areas where future professional learning opportunities will be needed in the implementation process with the new *KAS for Mathematics* and discuss the plan to address those areas.

Section 1A: Revision Process Overview

- ▶ Essential idea: To provide the legislative impetus around standards revisions (SB1, 2017) and a general overview of the role Kentucky educators played in the revision process.

Module 1: Getting to Know the *Kentucky Academic Standards (KAS) for Mathematics*

Preparation for Section 1A: Revision Process Overview

Print Materials Needed:

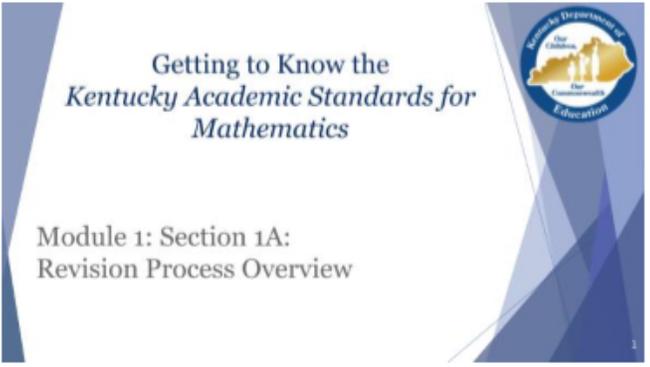
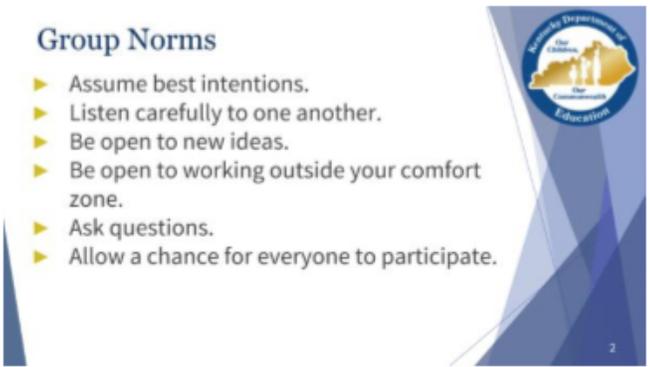
As the facilitator you can print copies of the materials at the links provided or have participants print their own copies. If participants are responsible for printing their own copies, please specify that and provide necessary links within the invitation to the work session. Ensure that you have sufficient copies of the following documents within each work session.

Posters to Make Ahead of Time:

- Issues Bin Poster:
 - Poster can just be labeled “Issues Bin”. The Issues bins can be used by the participant to note ideas, questions, or issues constructively while the class continues to focus on an activity or lesson. This may be a poster or you may prefer to have a digital Issues Bin where participants can access a Google document, for example, to post questions and that you can modify as the participants work through the sections of the module.
- Setup for Success: Brainwriting
 - Prepare four posters with one the following questions written per poster:
 - What is something you tried in your classroom this year for the first time? How did it go?
 - What is one way you grew professionally this year?
 - Who amongst your colleagues was the most helpful to you? Why?
 - In what ways were you helpful to your colleagues this year?



Section 1A: Revision Process Overview

Facilitator Notes	Accompanying Slide(s)
<p><i>Officially welcome the participants. Introduce yourself (if necessary).</i></p> <p>Explain: “Module 1 is intended to provide an introduction to the new <i>KAS for Mathematics</i>. The implementation of the <i>KAS for Mathematics</i> will mean that there are changes for educators and students across the state.”</p>	 <p>Getting to Know the Kentucky Academic Standards for Mathematics</p> <p>Module 1: Section 1A: Revision Process Overview</p>
<p>Explain: “Group norms can help to create a safe space where participants feel comfortable sharing their ideas and experiences. This slide is a starter. Take a moment to read the norms.”</p> <p><i>After people are finished, ask if anyone would like to revise, edit or add any norms to the list. If so, make changes on the slide; if not, move on to your discussion of the Issues Bin.</i></p> <p>Explain: “I realize you may not want to pose every question to the whole group, or we may not have time in the session to get to every question. Therefore, I want us to have a place for to address those issues.</p> <p><i>Introduce participants to the Issues Bin. The Issues bin can be used by the participant to note ideas, questions, or issues constructively while the other attendees continue to focus on an activity or lesson. This may be a poster or you may prefer to have a digital parking lot where participants can access a Google document, for example, to post questions and that you can modify as the</i></p>	 <p>Group Norms</p> <ul style="list-style-type: none">▶ Assume best intentions.▶ Listen carefully to one another.▶ Be open to new ideas.▶ Be open to working outside your comfort zone.▶ Ask questions.▶ Allow a chance for everyone to participate.

Section 1B: Understanding the Architecture

- ▶ Essential idea: To provide the location of key components within the *KAS for Mathematics* and to have participants consider how each component might be utilized differently by different stakeholders.
- ▶ Provides focused highlights on the architecture of the standards including:
 - Grade-level Overview
 - Standards for Mathematical Practice (subject of Section 1C)
 - Standards for Mathematical Content (subject of Section 1D)
 - Clarifications (subject of Section 1E)
 - Coherence (subject of Section 1E)



After participants have had time to collaborate, facilitate discussion over the questions.

Possible responses might be:

- *Standards for Mathematical Practices*

*Many **teachers** are unfamiliar with the SMPs and will need guidance for how to incorporate them into instruction. The SMPs will give **administrators** insight into experiences students should consistently be having within classroom instruction. The SMPs also represent skills that generate capacity within **students** throughout and beyond their K-12 experiences and are the same skills that **employers** will look for in prospective employees.*

- *Clarifications*

*The Clarifications will assist **teachers**, especially those new to the profession, understand the intent of the standards. For **administrators** who do not have strong mathematical backgrounds, the Clarifications provide a tool that will help them better assess the teaching and learning taking place in the classroom. For **parents** and **citizens** who do not have strong mathematical backgrounds, the Clarifications provide a tool that will help them better understand what students should be learning. When considering **student** level learning targets, the Clarifications may provide **student-friendly** explanations of the content standards.*

- *Coherence/Vertical Alignment*

*The Coherence/Vertical Alignment piece will be useful for **teachers** and **administrators** as districts, schools, and departments begin the work of aligning their curriculum to the standards. **Teachers** and **parents** can use the Coherence/Vertical Alignment to provide targeted support for students who need intervention, as well as to guide enrichment for students ready to progress.*

Extension: Consider how to ensure stakeholders understand the tools within the KAS for

Section 1C: A Closer Look: Standards for Mathematical Practice



▶ Essential idea: Educators around the state have varying levels of experience with designing and implementing instruction that attends to the practice standards. The rollout of the *KAS for Mathematics* presents a great opportunity for educators around the state to develop a shared understanding of how to engage students in the practices.

▶ Provides a focused learning experience around the Standards of Mathematical Practice including:

- Task: Attending to the SMPs
- Task: Sample Task Match-up
- Resource: Engaging the SMPs: Look fors & Question Stems
- Optional Extension: Reflection on Current Instructional Choices

Module 1: Getting to Know the *Kentucky Academic Standards (KAS) for Mathematics*

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

Print Materials Needed:

As the facilitator you can print copies of the materials at the links provided or have participants print their own copies. If participants are responsible for printing their own copies, please specify that and provide necessary links within the invitation to the work session. Ensure that you have sufficient copies of the following documents within each work session.

- Section 1C: A Closer Look: Standards for Mathematical Practice
 - Participant Guide: Attending to the SMPs
 - Kindergarten: https://education.ky.gov/curriculum/standards/kyacadstand/Documents/Kindergarten_Cluster_SMP_Activity.pdf
 - First Grade: https://education.ky.gov/curriculum/standards/kyacadstand/Documents/First_Grade_Cluster_SMP_Activity.pdf
 - Second Grade: https://education.ky.gov/curriculum/standards/kyacadstand/Documents/Second_Grade_Cluster_SMP_Activity.pdf
 - Third Grade: https://education.ky.gov/curriculum/standards/kyacadstand/Documents/Third_Grade_Cluster_SMP_Activity.pdf
 - Fourth Grade: https://education.ky.gov/curriculum/standards/kyacadstand/Documents/Fourth_Grade_Cluster_SMP_Activity.pdf
 - Fifth Grade: https://education.ky.gov/curriculum/standards/kyacadstand/Documents/Fifth_Grade_Cluster_SMP_Activity.pdf
 - Sixth Grade: https://education.ky.gov/curriculum/standards/kyacadstand/Documents/Sixth_Grade_Cluster_SMP_Activity.pdf
 - Seventh Grade: https://education.ky.gov/curriculum/standards/kyacadstand/Documents/Seventh_Grade_Cluster_SMP_Activity.pdf
 - Eighth Grade: https://education.ky.gov/curriculum/standards/kyacadstand/Documents/Eighth_Grade_Cluster_SMP_Activity.pdf
 - HS Algebra: https://education.ky.gov/curriculum/standards/kyacadstand/Documents/HS_Algebra_Cluster_SMP_Activity.pdf
 - HS Functions: https://education.ky.gov/curriculum/standards/kyacadstand/Documents/HS_Functions_Cluster_SMP_Activity.pdf
 - HS Geometry: https://education.ky.gov/curriculum/standards/kyacadstand/Documents/HS_Geometry_Cluster_SMP_Activity.pdf
 - HS Stats/Prob: https://education.ky.gov/curriculum/standards/kyacadstand/Documents/HS_Statistics_Probability_Cluster_SMP_Activity.pdf
 - HS Calculus: https://education.ky.gov/curriculum/standards/kyacadstand/Documents/HS_Calculus_Cluster_SMP_Activity.pdf
 - Participant Guide: SMP Sample Task Match-up
 - Kindergarten:
https://education.ky.gov/curriculum/standards/kyacadstand/Documents/Module_1_Section_1C_Practice_Standards_Discovery_Activity_Kindergarten.pdf

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

Kindergarten Sample Tasks	Kindergarten Sample Tasks
<p style="text-align: center;">Task A:</p> <p>Materials:</p> <ul style="list-style-type: none"> * One of the student's shoes to use to compare to other items. * A bin of seven to ten commonly used classroom items, such as a glue bottle, a pair of scissors and a crayon, that are similar in size but distinctly longer or shorter than a students' shoe. * Sheets of paper, folded in half with the words 'longer' and 'shorter' written, in 2 different colors, at the top of each side. <div style="text-align: center; border: 1px solid black; width: 300px; margin: 10px auto; padding: 5px;"> <div style="display: flex; justify-content: space-around; width: 100%;"> Longer Shorter </div> </div> <p>Setup: All students have the prepared sheet of paper and a pencil.</p> <p>Action: The students begin by removing their shoe; this is their 'measuring item'. Then they select an item from the bin to measure against their 'measuring item'. They directly compare it by holding it against their item and decide if it is longer or shorter than their shoe. The students then draw a picture of it on the correct side of the longer/shorter sheet depending on how it measured up. They continue to compare items to measure against their shoe until they have 2-3 drawings on each side of their sheet.</p>	<p style="text-align: center;">Task B:</p> <p>Materials</p> <p>Long, skinny objects to compare; for example:</p> <ul style="list-style-type: none"> • a pair of scissors • a crayon • a glue stick • a long, skinny wooden block from the classroom block set • a marker <p>Actions</p> <p>The teacher will pre-select a group of classroom objects for the students to use. Each student will choose two objects to compare and they will lay them next to each other and compare which is longer. The teacher may need to show students that they need to make sure the starting ends are correctly lined up, like this:</p> <div style="text-align: center; margin: 10px 0;">  </div> <p>Not like this this:</p> <div style="text-align: center; margin: 10px 0;">  </div> <p>The teacher can have the students record their findings in one of two ways:</p> <ul style="list-style-type: none"> * Students can trace both objects on a black piece of white paper. The students can label their drawings depending on their literacy skills and then circle the longer object. * Students can use the attached blackline master. This requires higher level skills as students must decide which object is the longer and shorter object, conserve that information in their brain and then write

Please note that inclusion of these sample tasks does not represent that this task is endorsed by or rejected by the Kentucky Department of Education. Inclusion of these tasks was for the sole purpose of allowing participants the opportunity to investigate the practice standards within the *Kentucky Academic Standards for Mathematics* more closely. All tasks were selected from *Illustrative Mathematics*.

Module 1: Section 1C: A Closer Look at the Standards for Mathematical Practice: Kindergarten Sample Tasks

Participant Guide

Directions: Match each task to the SMP targeted by the author of the task. While some tasks may connect to more than one SMP, there is one task that most closely aligns with each of the SMPs. Thus, each SMP will have one task to match and each task will only be used once.

Note: The Standards for Mathematical Practice focus on the nature of the learning experiences by attending to the thinking processes and habits of mind that students need to develop in order to attain a deep and flexible understanding of mathematics. Certain tasks lend themselves to the demonstration of specific practices by students. The practices that are observable during exploration of a task depend on how instruction unfolds in the classroom. While it is possible that tasks may be connected to several practices, only one practice connection will be discussed in depth. Possible secondary practice connections may be discussed but not in the same degree of detail.

Standards of Mathematical Practice (SMP)	Standards of Mathematical Practice (SMP)
MP.1. Make sense of problems and persevere in solving them.	MP.5. Use appropriate tools strategically.
MP.2. Reason abstractly and quantitatively.	MP.6. Attend to precision.
MP.3. Construct viable arguments and critique the reasoning of others.	MP.7. Look for and make use of structure.
MP.4. Model with mathematics.	MP.8. Look for and express regularity in repeated reasoning.

Please note that inclusion of these sample tasks does not represent that this task is endorsed by or rejected by the Kentucky Department of Education. Inclusion of these tasks was for the sole purpose of allowing participants the opportunity to investigate the practice standards within the *Kentucky Academic Standards for Mathematics* more closely. All tasks were selected from Illustrative Mathematics.

Facilitator's Guide

Throughout facilitation of this activity it will be important to remind participants:

- Use the cluster level narratives to better understand what attending to the mathematical practices might look like in the classroom.
- Emphasize to participants the statement at the end of each cluster within the *KAS for Mathematics*, "The identified mathematical practices, coherence connections, and clarifications are possible suggestions; however, they are not the only pathways."

Standards of Mathematical Practice (SMP)	Standards of Mathematical Practice (SMP)
<p>MP.1. Make sense of problems and persevere in solving them.</p> <p style="text-align: center;">Task D:</p> <p>Kindergartners are exposed to multiple problems through the story, <i>The Napping House</i>. As students listen to the story they use counters on a ten frame to keep track of each additional person/animal who gets in the bed until the flea bites the mouse. Then the story changes to subtraction as people/animals start to leave the bed. Throughout this guided task, students are introduced to the processes of problem-solving in a non-threatening way. They are able to unpack the parameters of the problem by manipulating the counters one at a time. This allows them to make sense of the actions occurring in the story. These concrete objects help them to conceptualize and solve each problem as posed in the story. The teacher can guide this conceptualization by stopping after each action and asking questions such as, "What just happened in the story?" "How are we going to show that on our ten frames?" "How many are in the bed now?" and "How do you know how many are in the bed?"</p>	<p>MP.5. Use appropriate tools strategically.</p> <p style="text-align: center;">Task A:</p> <p>During this exploration, young learners investigate the attribute of length by directly comparing two objects and deciding which object is shorter and which is longer (one of the objects is the student's shoe). Kindergartners will easily directly compare lengths in simple situations. In this case, the shoe becomes the measuring tool because it is consistently used for all comparisons the child makes. As students become proficient in this practice, they will be able to consider a tool's usefulness and consider its strengths and limitations, as well as know how to use it appropriately. Since this may be a new experience for kindergartners, there will be learning involved as to how to position the two objects to accurately compare their lengths.</p> <p>The necessity of aligning endpoints can be explicitly addressed and reinforced throughout this task (MP.6). The opportunity for conversation often occurs in comparison situations ("The teacher's</p>

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

- ▶ Essential idea: To develop an understanding of grade-level expectations that will lay the groundwork for making appropriate instructional choices moving forward.
- ▶ Provides a focused learning experience needed to ensure grade-appropriate instructional decisions can be made which includes:
 - Task: Connecting with the Content
 - Optional Extension: Reflection on Current Instructional Choices



Module 1: Getting to Know the *Kentucky Academic Standards (KAS) for Mathematics*

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

Print Materials Needed:

As the facilitator you can print copies of the materials at the links provided or have participants print their own copies. If participants are responsible for printing their own copies, please specify that and provide necessary links within the invitation to the work session. Ensure that you have sufficient copies of the following documents within each work session.

- Section 1D: A Closer Look: Standards for Mathematical Content
 - Participant Guide: Connecting with the Content
 - Kindergarten: https://education.ky.gov/curriculum/standards/kyacadstand/Documents/Module_1_Section_1D_Content_Standards_Discovery_Activity_Kindergarten.pdf
 - First Grade: https://education.ky.gov/curriculum/standards/kyacadstand/Documents/Module_1_Section_1D_Content_Standards_Discovery_Activity_First_Grade.pdf
 - Second Grade: https://education.ky.gov/curriculum/standards/kyacadstand/Documents/Module_1_Section_1D_Content_Standards_Discovery_Activity_Second_Grade.pdf
 - Third Grade: https://education.ky.gov/curriculum/standards/kyacadstand/Documents/Module_1_Section_1D_Content_Standards_Discovery_Activity_Third_Grade.pdf
 - Fourth Grade: https://education.ky.gov/curriculum/standards/kyacadstand/Documents/Module_1_Section_1D_Content_Standards_Discovery_Activity_Fourth_Grade.pdf
 - Fifth Grade: https://education.ky.gov/curriculum/standards/kyacadstand/Documents/Module_1_Section_1D_Content_Standards_Discovery_Activity_Fifth_Grade.pdf
 - Sixth Grade: https://education.ky.gov/curriculum/standards/kyacadstand/Documents/Module_1_Section_1D_Content_Standards_Discovery_Activity_Sixth_Grade.pdf
-

Section 1E: Spotlight: Clarifications & Coherence

- ▶ Essential Idea: To understand how the Clarifications communicate expectations of the standards more clearly and concisely and to examine the Coherence within the *KAS for Mathematics* on a wider scale, exploring connections within and across grade-level expectations.
- ▶ Provides a focused investigation of the connections within and across grade level including:
 - Task: Coherence Card Sort



Section 1F: Spotlight: Front Matter & Appendices

- ▶ Essential idea: To highlight some often-overlooked information provided in the *KAS for Mathematics*. Mathematical fluency, the modeling cycle and specific tools to aide K-5 educators when planning instruction around word problems receive specific attention here.
- ▶ Provides a focused look at supplemental educational resources within the *KAS for Mathematics* including:
 - Video Clip: Fluency in Mathematics



Section 1G: Wrap up & Next Steps

- ▶ Essential idea: To provide educators with time for reflecting upon guiding questions to plan and prioritize the work that will follow this module.
- ▶ Provides a review of the learning throughout the module, as well as:
 - Planning Guides (Teachers, School Leadership, District Leadership)
 - Kentucky Department of Education Feedback Survey link



Module 1: Section 1G: Thinking Back to Plan for the Future

Teacher Guide

The implementation of the *Kentucky Academic Standards (KAS) for Mathematics* will mean that there are changes for educators across the state. Educators at every level will need to consider what the next steps will be within the implementation process and identify the supports needed to ensure that implementation is successful. Having an understanding of the *KAS for Mathematics* and its components is just the first step, **actions determine impact**.

Here are some things you might want to consider within your work group:

Pains	Gains	Support needed:	Priorities:
<ul style="list-style-type: none">● What “pains” or obstacles exist that you will need to plan to address or overcome?● What are your fears?	<ul style="list-style-type: none">● What choices could you make that will benefit or generate “gains” within your students?● What choices could you make that will benefit or generate “gains” within yourself as an educator?● What are the positive outcomes that you expect to see?● What incentives exist for reaching the goal?	<ul style="list-style-type: none">● Within yourself or your team, do you already have the capacity to handle certain aspects of the work ahead?● What professional learning will be helpful in building that capacity?● Who are the “go-to”s that need to be contacted for support or involved in the decision-making process to drive progress forward?	<ul style="list-style-type: none">● Which areas are of the greatest priority to begin?● What work can be done now to begin preparing your department, your school, or your district to move forward?

Section 1G: Wrap up & Next Steps

- ▶ Essential idea: To provide educators with time for reflecting upon guiding questions to plan and prioritize the work that will follow this module.
- ▶ Provides a review of the learning throughout the module, as well as:
 - Planning Guides (Teachers, School Leadership, District Leadership)
 - Kentucky Department of Education Feedback Survey link



5 Things to Know Before You Go:

1. Choosing and supporting PL facilitators
2. June Conference
 - Louisville location added for June 11
 - Registration links on kystandards.org
3. Subscription emails
 - Make sure to check your junk mail
4. Remember to contact your cooperative for support
5. Next week's webcast: Standards for Mathematical Practices



