



Kentucky Department of  
**EDUCATION**

## *Kentucky Academic Standards (KAS) for Mathematics*

### At a Glance

This document provides an overview of what the standards committees revised based on two rounds of public feedback and the standards revision process required by KRS 158.6453.

#### **General Highlights:**

1. The updated **Writers' Vision Statement** is included on pages 3-4 of the *KAS for Mathematics*.
2. **High School Coding** was expanded to support coherent and flexible mathematics pathways:
  - a. **Foundational (■)** standards clearly identify required content designated for the first and second mathematics credits (Algebra I and Geometry or their equivalents);
  - b. **Delta (Δ)** standards are recommended for the third and fourth personalized credits;
  - c. **Plus (+)** standards represent recommended content for advanced geometry courses that extend beyond required foundational concepts; and
  - d. **Plus Plus (++)** symbols continue to identify standards recommended for Calculus and beyond.
3. Numerous **high school standards** across domains were recategorized to align with the new coding framework.
4. **Grade Level Overviews** for K-8 were updated to better summarize and communicate the key grade-level content within each strand of the standards.
5. **Conceptual Category Overviews** at the high school level now include an explanation of the purpose of each conceptual category, the definitions of the new coding symbols and a summary of the key content aligned to the type of standards (Foundational, Delta, Plus or Plus Plus), emphasizing the learning progression within each conceptual category.
6. To support stakeholders' understanding of true fluency, **Procedural Fluency in Mathematics** is now consistently defined (and linked to a fuller explanation within the introduction) in the K-12 fluency standards throughout the document.
7. **Clarifications** were updated across grade levels to include **images, examples and other supports** to more clearly communicate the intent of the standards.

#### **Content Changes of Note:**

Each of these revisions were made based on public feedback and current research.

#### **Grades K-5**

##### **Operations/Algebraic Thinking (OA):**

- **4.OA.3** focuses on representing and solving multistep word problems and interpreting results. Evaluating expressions using order of operations was removed from this standard to preserve the intent of this application standard.
- **5.OA.1** was then revised to explicitly include "conventional order (Order of Operations)" to maintain coherence with the removal of standard 4.OA.3a.

##### **Number and Operations in Base Ten (NBT):**

- **4.NBT.5 and 4.NBT.6** were revised to clarify that students should "explain [their] reasoning using a representation" rather than simply "illustrate."
- **5.NBT.7a** now widens strategy use beyond relationships between just addition and subtraction to "relationships between operations" to align to evidence-based research.

## **Number and Operations Fractions (NF):**

- In **5.NF.1**, the word “efficiently” was removed to emphasize conceptual understanding during students’ first experiences adding and subtracting fractions with unlike denominators. Neither efficiency nor fluency is yet expected at this stage.

## **Measurement and Data (MD):**

- **5.MD.4** substitutes “non-standard cubic units” for “improvised units” when measuring volume.

## **Grades 6-8**

### **Clarification Regarding Surface Area:**

- Because surface area is introduced in grade 7, the standards writers removed all mentions of surface area within grade 6 supports (such as the Overview, Cluster headings, etc.) for clarification.

### **Ratios and Proportional Relationships (RP):**

- **6.RP.3c** was created to formally introduce percents in grade 6 to align with developmental appropriateness and widely used high-quality instructional resources within Kentucky.
- **7.RP.3a** no longer includes an introduction to percent and now focuses on solving percent problems, clarifying that students should find a single unknown such as a whole, a part or a percent when given two of those.

### **The Number System (NS):**

- **6.NS.2a** and **6.NS.2b** were combined to create a single, comprehensive standard **6.NS.2** that promotes student understanding of a unified number system relating multi-digit division to rational and irrational decimals.

### **Expressions and Equations (EE):**

- **7.EE.4a** no longer requires students to “graph the solution” since the solution for that type of equation is almost always a single discrete point and graphing it would not add to student understanding like it would when graphing the solution set for an inequality in 7.EE.4b.
- **8.EE.3** and **8.EE.4** were updated to reflect the importance of expressing, comparing and ordering very large and very small quantities in scientific notation as opposed to performing operations with numbers expressed in scientific notation.

### **Statistics and Probability (SP):**

- **The Cluster heading for 6.SP.1, 6.SP.2 and 6.SP.3** was renamed to “Develop understanding of measures of center and variability” to more accurately reflect the content in those standards.
- **7.SP.3** and **7.SP.4** no longer require mean absolute deviation as current research finds this developmentally inappropriate at this stage and not a prerequisite for high school standards.

### **Middle School Fluency Across Domains:**

- **6.EE.2, 7.NS.1d, 7.NS.2c** and **8.EE.7** now include the word “fluently.” These standards were already designated as fluency standards within the 2019 Appendix. Now that expectation is embedded directly within the standards themselves for consistency across grade levels.

## **Grades 9-12**

### **Algebra (A):**

- **HS.A.7, HS.A.15** and **HS.A.19** were partitioned into parts and categorized using the new coding to more clearly identify which parts of the standards are required in foundational courses and which content may be covered in the third or fourth personalized credits.