Breaking Down a Mathematics Standard

KAS: KY.HS.A.2

What is the domain/conceptual category/big idea? Algebra - Seeing Structure in Expressions

Standards for Mathematical Practice

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.

Cluster: What is the broader understanding that the standard plays a role in building? Interpret the structure of expressions.

Standards

- Identify the target of the standard:
  - o conceptual understanding
  - o procedural skill/fluency
  - o application

  Both needed to meet the full intent of the standard!

Consider how the target of the standard will have an impact on instruction and assessment. (For more information, refer to p. 7, 10 and 15 of *KAS for Mathematics*.)

Conceptual Understanding: more than knowing isolated facts & methods; students should be able to make sense of why a mathematical idea is important and the kinds of contexts in which it is useful.

Procedural Skill/Fluency: ability to apply procedures accurately, efficiently, flexibly, & appropriately

- What key mathematics should students know and be able to do?

Use structure to rewrite expressions in equivalent forms...

from HS Matrix
- Foundational
  - ↳ 1st & 2nd degree (linear/quadratic) expressions
- Post Foundational
  - ↳ higher degree expressions

Clarifications

- What are the specific representations/strategies that will need to be considered when planning instruction?
  - 3 common forms of a quadratic: standard, factored, vertex
  - Can technology be used to support learning here?

  Emphasis on when one form might be more useful than another (very purposeful!)
- What are the possible misconceptions that will need to be addressed during instruction?
  - Misunderstanding of vocabulary (factors/solutions, etc)
  - Might over-rely on procedures & convert between forms when not necessary (too time consuming)
  - Typical misunderstanding → $(x \pm y)^2 = x^2 \pm 2xy + y^2$ not $x^2 \pm y^2$

Coherence: Previous Grade → Current Standard → Upcoming Grade

- How does this standard build off of prior learning?

Middle grades → Expressions & Equations domains

- How does this standard support future learning?

Foundational → KY.HS.A.3b: relationship between factors & zeros (Quad) (also function standards)

Post Foundational ↳ KY.HS.A.7: relationship between factors & zeros (higher degree)

- How does this standard connect to other standards (or even other clusters or domains)?

HS Algebra is closely related to HS Functions

for example: KY.HS.F.1, KY.HS.F.4, KY.HS.F.5

Attending to the Standards for Mathematical Practice

- How are students engaging in the mathematical practices as they learn this content? (For more information, refer to p. 12-15 of *KAS for Mathematics*.)

MP8 → Students fluently manipulate expressions into equivalent forms, based on patterns they've noticed across problems