# Breaking Down a Mathematics Standard

**KAS: KY.HS.G.30**

## What is the domain/conceptual category/big idea?

Geometry → Modeling with Geometry

## Standards for Mathematical Practice

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

## Cluster: What is the broader understanding that the standard plays a role in building?

Apply geometric concepts in modeling situations

## Standards

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

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

Application: provides a valuable context for learning & the opportunity to solve problems in a relevant and meaningful way.

- Students: 1) select an efficient solution method, 2) use reasoning to determine whether solution makes sense, 3) develop critical thinking skills

- What key mathematics should students know and be able to do?
- Any mathematical object that represents a situation from outside mathematics and can be used to solve a problem about that situation is a mathematical model.
- Many of the formulas for things like area/surface area/volume are the work of previous grades, the contexts & modeling involved in HS must be more sophisticated than prior grades

## Clarifications

- What are the specific representations/strategies that will need to be considered when planning instruction?
- What are the possible misconceptions that will need to be addressed during instruction? Throughout the modeling process, students may need to make new assumptions to get a close usable result.
- Are the results practical? Reasonable?

Coherence: Previous Grade → Current Standard → Upcoming Grade

- How does this standard build off of prior learning?
- How does this standard support future learning?
- How does this standard connect to other standards (or even other clusters or domains)?

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.)
- Students apply the mathematics they know to solve problems that arise in everyday life. Students can make assumptions, approximations, or simplifications to simplify a complicated situation, realizing that these may need revision later.
- Students consider analogous problems, try special cases, simpler forms of the original problem in order to gain insight into solutions. Students monitor and evaluate progress and change course if necessary.
- Students communicate precisely to others, calculate accurately, express answers at an appropriate degree of precision for the context.

Notes:

- The Modeling Process (p. 19 of this document)
- Identifying the problem, make assumptions/identify variables, do the math, analyze, assess the solution, iterate, implement the model.
- KY.HS.G.24, KY.HS.G.25, KY.HS.G.27: Various real-world contexts may relate to each of these → modeling
- KY.HS.N.4, KY.HS.N.5, KY.HS.N.6: Also modeling Standards

- Relations to Number & Quantity
- KY.HS.N.1
- KY.HS.N.1

- KY.HS.G.30