

# 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	Clarifications
<ul style="list-style-type: none"> <li>• Identify the target of the standard:                             <ul style="list-style-type: none"> <li>o conceptual understanding</li> <li>o procedural skill/fluency</li> <li>o application</li> </ul> </li> </ul> <p>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.)</p> <p><b>Application:</b> provides a valuable context for learning &amp; the opportunity to solve problems in a relevant and meaningful way.</p> <p><b>Students:</b></p> <ol style="list-style-type: none"> <li>1) select an efficient solution method</li> <li>2) use reasoning to determine whether solution makes sense</li> <li>3) develop critical thinking skills</li> </ol> <ul style="list-style-type: none"> <li>• What key mathematics should students know and be able to do?</li> </ul> <p>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.</p> <p>Many of the formulas for things like area/surface area/volume are the work of previous grades, the contexts &amp; modeling involved in HS must be more sophisticated than prior grades</p>	<ul style="list-style-type: none"> <li>• What are the specific representations/strategies that will need to be considered when planning instruction? <b>The Modeling Process</b> (p. 8-9 of KAS document) details components: identify the problem, make assumptions/identify variables, do the math, analyze &amp; assess the solution, iterate, implement the model.</li> <li>• 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 closer usable result                             <ul style="list-style-type: none"> <li>- Are the results practical? Reasonable?</li> </ul> </li> </ul> <p>Coherence: Previous Grade → Current Standard → Upcoming Grade</p> <ul style="list-style-type: none"> <li>• How does this standard build off of prior learning? <b>In Grades 6-8:</b> students apply geometric measurement to real-world mathematical problems to calculate/estimate lengths, areas (including SA), &amp; volumes.</li> <li>• How does this standard support future learning? <b>KY.HS.G.24, KY.HS.G.25, KY.HS.G.27:</b> various real-world contexts may relate to each of these → modeling</li> <li>• How does this standard connect to other standards (or even other clusters or domains)? <b>Relates to Number &amp; Quantity</b> <ul style="list-style-type: none"> <li>← KY.HS.N.4</li> <li>← KY.HS.N.5</li> <li>← KY.HS.N.6</li> </ul> </li> </ul> <p>also modeling standards</p>

## 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.)
- MP.4 → Students can apply the mathematics they know to solve problems that arise in everyday life. Students can make assumptions: approximations to simplify a complicated situation, realizing that these may need revision later

- MP.1 → Students consider analogous problems, try special cases, simpler forms of the original problem in order to gain insight into solutions. Students monitor & evaluate progress and change course, if necessary.
- MP.6 → Students communicate precisely to others, calculate accurately, express answers at an appropriate degree of precision for the context