

# Geometry Assessments for Secondary Teachers

## GOAL

To improve high geometry teaching through the development of written geometry assessments for teachers that will predict classroom teaching performance and student achievement in geometry.

UNIVERSITY OF LOUISVILLE

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## Project Teams

### University of Louisville

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### Horizon Research

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### Alpine Testing Solutions

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## Criteria for Assessment

Geometry Knowledge for Teaching		Mathematics Content Areas
Subject matter knowledge	Knowledge of resources	Congruence and Similarity
Pedagogical content knowledge	Knowledge of mathematics on horizon	Surface Area and Volume
Knowledge of student learning		

## Assessment Blueprint

### 1) Teacher Knowledge of Mathematics

The teacher--

- Recognizes and describes appropriate demonstrations, interpretations, analogies, and justifications to introduce and develop mathematical skills and procedures.
- Recognizes and describes appropriate definitions, representations, examples, distinguishing examples, non-examples, counter-examples, and necessary and sufficient conditions to introduce and develop mathematical concepts.
- Recognizes and describes meaningful connections (lateral, upward, downward) within and among mathematics content.
- Recognizes and constructs meaningful mathematical models of real world situations.

### 2) Teacher Knowledge of Geometric Reasoning and Problem Solving

The teacher--

- Solves non-routine problems, including real world applications, in geometry.
- The teacher analyzes and constructs synthetic, transformational, and analytical proofs; and recognizes valid and invalid arguments (e.g., reasoning by converse, proofs by contradiction, negating, arguing the contrapositive, non-example).
- The teacher analyzes and justifies geometric formulas.

### 3) Teacher Knowledge of Student Learning

The teacher--

- Recognizes and describes strategies and activities that promote student reasoning and problem solving.
- Anticipates, recognizes, describes, assesses, and addresses correct and incorrect elements of student.
- Recognizes, describes, and assesses critical student prerequisite knowledge.
- Recognizes and constructs mathematics assessment tasks at different cognitive levels.
- Recognizes and describes advantages and limitations of using digital technologies to foster student learning.
- Recognizes and describes advantages and limitations of using physical models and tools (e.g., compass, straight edge, protractor) to foster student learning.

## Timeline

Spring 2009	Fall 2009 / Winter 2010	Spring 2010	Fall 2010	Winter / Spring 2010
Develop Blueprint for Assessment	Develop Items Based on Blueprint	Field Test Assessments	Revise Assessments Develop Observation Tools Identify Student Assessment	Establish Predictive Validity