



INDIANA ACADEMIC STANDARDS FRAMEWORKS

Mathematics: Grade 7

Overview

The *Geometry and Measurement* domain in grade seven builds on grade five learning in which students investigate properties of triangle and circles,^{5.G.1} find the areas of triangles and quadrilaterals, and understand the volume of a rectangular prism by packing it with unit cubes.^{5.M.2-4} In grade six, students apply the Triangle Angle Sum Theorem to solve real-world problems,^{6.GM.2} find the area of complex shapes, and calculate the volume of rectangular prisms.^{6.GM.2-4} In grade seven, students use proportional reasoning to solve real-world problems involving scale drawings.^{7.GM.1} They also understand the formulas for area and circumference of a circle and solve real-world problems involving the volume of cylinders and other solids.^{7.GM.2-3} Students in grade eight find the volume of cones, spheres, and pyramids.^{8.GM.2} These concepts support learning in high school geometry that focuses on congruence, similarity, and the relationships between two and three dimensional figures.

Geometry and Measurement	
Learning Outcome	Students use scale drawings, the area and circumference of circles, and the volume of cylinders and other three-dimensional solids to solve real-world problems.
Standard	7.GM.1: Solve real-world and other mathematical problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing. Create a scale drawing by using proportional reasoning.
Evidence Statements	Academic Vocabulary
<ul style="list-style-type: none"> Solve real-world problems that involve scale drawings of geometric figures, accurately computing actual lengths and areas based on a given scale. Create a scale drawing of a geometric figure using proportional reasoning, ensuring that the relative sizes and proportions of the original figure are accurately represented. Determine missing lengths or areas in scale drawings by applying proportional reasoning and using known lengths or areas. 	<ul style="list-style-type: none"> Scale drawing Proportional reasoning Actual length Actual area Original figure Relative sizes Corresponding side lengths Corresponding areas Missing lengths Missing areas Known lengths Known areas Ratios
Clarification Statements	Common Misconceptions
<ul style="list-style-type: none"> Provide opportunities for students to identify and analyze scale factors in scale drawings, 	<ul style="list-style-type: none"> Students may incorrectly compute actual lengths and areas by misinterpreting or

<p>emphasizing the connection between the scale factor and the relative sizes of corresponding lengths and areas in the original figure and the scale drawing.</p> <ul style="list-style-type: none"> Engage students in interpreting and explaining the meaning of a scale in a scale drawing, focusing on the relationship between the lengths or areas in the scale drawing and the corresponding lengths or areas in the original figure. Emphasize the importance of maintaining the proportional relationship between lengths or areas in the scale drawing and the original figure. Provide opportunities for students to use scale drawings of geometric figures with a given scale that requires them to draw and label the dimensions of the new shape. Initially, measurements should be in whole numbers, progressing to measurements expressed with rational numbers. This will challenge students to apply their understanding of fractions and decimals. After students have explored multiple iterations with a couple of shapes, ask them to choose and replicate a shape with given scales to find the new side lengths, as well as both the perimeters and areas. Starting with simple shapes and whole-number side lengths allows all students access to discover and understand the relationships. An interesting discovery is the relationship of the scale of the side lengths to the scale of the respective perimeters (same scale) and areas (scale squared). 	<p>misapplying the given scale in real-world problems involving scale drawings.</p> <ul style="list-style-type: none"> Students may confuse or misinterpret the scale factor in scale drawings, especially with scale factors that are fractions. Students may become confused about the correlation of the scale factor. For example, students may set up the scale factor to be A to B instead of B to A.
Looking Back	Looking Ahead
<p>6.GM.1: Convert between measurement systems (Customary to metric and metric to Customary) given the conversion factors, and use these conversions in solving real-world problems.</p>	<p>This concept is not specifically addressed in the Indiana Academic Standards in the subsequent grade levels.</p>
Instructional Resources	
<ul style="list-style-type: none"> Mathematics Grades 6-8 Vertical Articulation Guide Learning Progressions & Content Supports: Grade 6 through Grade 8 Implementing the Mathematics Process Standards: Grades Six to Eight Illustrative Mathematics - Map distance Mathematics Assessment Resource Service Shell Center - Photographs 	

Universal Supports for All Learners

- [2024 Content Connectors](#)
- [Universal Design for Learning Playbook](#)
- [UDL Guideline Infographic, from Learning Designed](#)
- [UDL Tips from CAST](#)
- [Mathematics Learning Recovery Series: Part 2-Addressing the Gaps in Student Learning](#)
- [Mathematics Learning Recovery Series: Part 3-Instructional Strategies for All Learners](#)

Instructional Strategies

- [What Works Clearinghouse-Concrete-Semi-Concrete-Abstract Video \(Print Recommendations\)](#)
- [What Works Clearinghouse-Clear & Concise Mathematical Language Video \(Print Recommendations\)](#)
- [NYSED-Frayer Vocabulary Model Scaffolding Example & Template](#)
- [Magma Math: Math Teaching Practices](#)
- [Problem Solving Instructional Support](#)
- [WIDA-Doing and Talking Mathematics: A Teachers Guide to Meaning-Making with English Learners](#)
- [Virginia Department of Education Students with Disabilities in Mathematics Frequently Asked Questions](#)

Assessment Considerations

- [ILEARN Test Blueprint: Mathematics 2025-2026 \(Spreadsheet\)](#)
- [ILEARN Test Blueprint: Mathematics 2025-2026 \(PDF\)](#)
- [IDOE Released Items Repository](#)
- [I AM - Indiana's Alternate Measure](#)
- [Quality Mathematic Items for Classroom Assessments \(Featuring New ILEARN Item Specifications\)](#)
- [Grade 7 & 8 ILEARN Math Desmos Scientific Calculator](#)
- [UDL Assessment Strategies](#)

Interdisciplinary Connections

Coming Soon

Disciplinary Literacy

Coming Soon

Contact IDOE's [Office of Teaching and Learning](#) with any questions.