

Grade 7 Target E

Domain, Target, Standards, DOK, Vertical Alignments, Achievement Levels, Evidence Required, Vocabulary, Response Types, Materials, Attributes, Question Types, and Question Banks (Examples)

[Content Domain: Geometry](#)

[Target E \[s\]: 7.G.A Draw, construct, and describe geometrical figures and describe the relationships between them.](#)

[Standards included in Target E: 7.G.A, 7.G.A.1, 7.G.A.2, 7.G.A.3](#)

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[Claim 1: Concepts and Procedures \(DOK 1, 2\) Question Banks](#)

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Standards included in Target E: 7.G.A, 7.G.A.1, 7.G.A.2, 7.G.A.3

7.G.A Draw, construct, and describe geometrical figures and describe the relationships between them.

7.G.A.1 Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.

7.G.A.2 Draw (freehand, with ruler and protractor, and with technology) geometric shapes with given conditions. Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle.

7.G.A.3 Describe the two-dimensional figures that result from slicing three-dimensional figures, as in plane sections of right-rectangular prisms and right-rectangular pyramids.

Vertical Alignment

Related Grade 6 standards

6.G.A Solve real-world and mathematical problems involving area, surface area, and volume.

6.G.A.1 Find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes; apply these techniques in the context of solving real-world and mathematical problems.

6.G.A.3 Draw polygons in the coordinate plane given coordinates for the vertices; use coordinates to find the length of a side joining points with the same first coordinate or the same second coordinate. Apply these techniques in the context of solving real-world and mathematical problems.

6.G.A.4 Represent three-dimensional figures using nets made up of rectangles and triangles, and use the nets to find the surface area of these figures. Apply these techniques in the context of solving real-world and mathematical problems.

Related Grade 8 Standards

8.G.A Understand congruence and similarity using physical models, transparencies, or geometry software.

8.G.A.1 Verify experimentally the properties of rotations, reflections, and translations:

- a. Lines are taken to lines, and line segments to line segments of the same length.
- b. Angles are taken to angles of the same measure.
- c. Parallel lines are taken to parallel lines.

8.G.A.2 Understand that a two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations; given two congruent figures, describe a sequence that exhibits the congruence between them.

8.G.A.3 Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.

8.G.A.4 Understand that a two-dimensional figure is similar to another if the second can be obtained from the first by a sequence of rotations, reflections, translations, and dilations; given two similar two-dimensional figures, describe a sequence that exhibits the similarity between them.

8.G.A.5 Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles. For example, arrange three copies of the same triangle so that the sum of the three angles appears to form a line, and give an argument in terms of transversals why this is so.

8.G.B Understand and apply the Pythagorean Theorem.

8.G.B.6 Explain a proof of the Pythagorean Theorem and its converse.

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8.G.B.7 Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.

8.G.B.8 Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.

Achievement Level Descriptors

Level 1 Students should be able to draw or construct geometric shapes with given conditions by freehand, with ruler and protractor, and by using technology.

Level 2 Students should be able to describe geometric shapes with given conditions, and determine whether or not a set of any three given angle or side-length measures can result in a unique triangle, more than one triangle, or no triangle at all. They should be able to describe the relationship between a geometric figure and its scale drawing by finding the scale factor between them.

Level 3 Students should be able to compute actual lengths and areas from a scale drawing, and reproduce a scale drawing using a different scale. They should be able to describe the two-dimensional figures that result from slicing prisms and pyramids by planes that are parallel to a given face.

Level 4 Students should be able to describe the two-dimensional figures that result from slicing cones, spheres, cylinders, or other three-dimensional figures with rectangular or triangular faces by planes that are not parallel to a given face.

Evidence Required

1. The student creates scale drawings.
2. The student solves problems involving scale drawings using proportional reasoning.
3. The student draws, constructs, or describes geometric shapes given certain conditions.
4. The student describes a two-dimensional figure resulting from slicing a three-dimensional figure by a plane.

Vocabulary

scale drawing, scale, scale factor, ratio, proportion, polygon, triangle (right, acute, obtuse, equilateral, isosceles, scalene), quadrilateral, trapezoid, parallelogram, cube, right-rectangular prism, right-rectangular pyramid, square pyramid, cone, cylinder, plane, perpendicular, parallel, base of a three-dimensional figure, horizontal slice, vertical slice

Response Types

Multiple Choice, multiple correct response; Matching Tables; Equation/Numeric; Graphing

Materials

None

Attributes

None

Claim 1: Concepts and Procedures (DOK 1, 2) Question Banks

Students can explain and apply mathematical concepts and carry out mathematical procedures with precision and fluency.

Claim 1 7.G.A.1 DOK Level 2

Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.

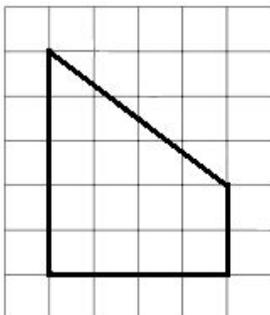
Evidence Required

The student creates scale drawings.

Question Type 1: The student is presented with a simple polygon on a grid and a scale factor.

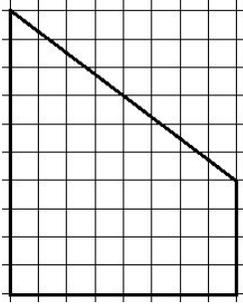
1. This figure is a scale drawing of a garden. Create another scale drawing of this figure where all side lengths are twice as long.

Use the Connect Line tool to draw the resulting figure.



Interaction: The student is given the Connect Line, Add Point, and Delete tools to draw the polygon on a grid.

Rubric: (1 point) Student draws the correct figure with correct dimensions. Allow for correct scoring regardless of orientation of the figure (see one example of a correct response below).



Response Types: Graphing

Claim 1 7.G.A.1 DOK Level 2

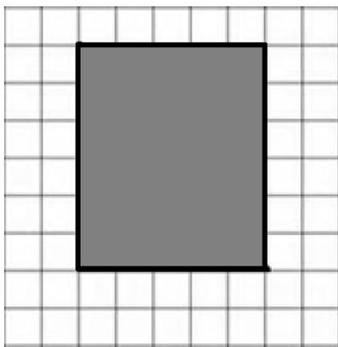
Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.

Evidence Required

The student creates scale drawings. The student solves problems involving scale drawings using proportional reasoning.

Question Type 1: The student is presented with a polygon (square, rectangle, parallelogram, or right triangle) on a grid and the scale factor at which it was created.

1. This diagram of a rectangular city park was drawn using a scale factor of 1 centimeter to 20 meters.



In the diagram shown, assume each square on the grid is 1 centimeter in length.

What is the area, in square meters, of the actual park on which this scale drawing is based?

Rubric: (1 point) Student enters the correct area (e.g., 12000).

Response Type: Equation/Numeric

Claim 1 7.G.A.1 DOK Level 1

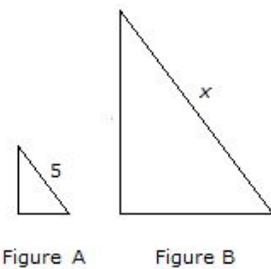
Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.

Evidence Required

The student solves problems involving scale drawings using proportional reasoning.

Question Type 1: The student is presented with two polygons and a scale factor. A side length is given and the corresponding side is labeled with a variable.

1. Figure A is a scale image of Figure B, as shown.



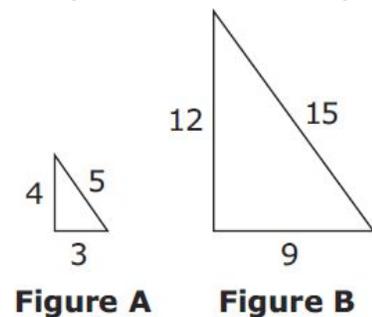
The scale that maps Figure A onto Figure B is $13: \frac{1}{2}$. Enter the value of x .

Rubric: (1 point) Student gives the correct value of the variable, which is a single numeric answer. Units, if given, should be assumed from the stem (e.g., 17.5).

Response Type: Equation/Numeric

Question Type 2: The student is presented with two polygons with lengths of some or all corresponding sides given or indicated by a grid.

1. Figure B is a scale image of Figure A, as shown.



Enter the scale factor applied to Figure A to produce Figure B.

Rubric: (1 point) Student gives the correct scale factor, which is a single numeric answer. The keypad should only contain numbers (e.g., 3).

Response Type: Equation/Numeric

Claim 1 7.G.A.1 DOK Level 2

Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.

Evidence Required

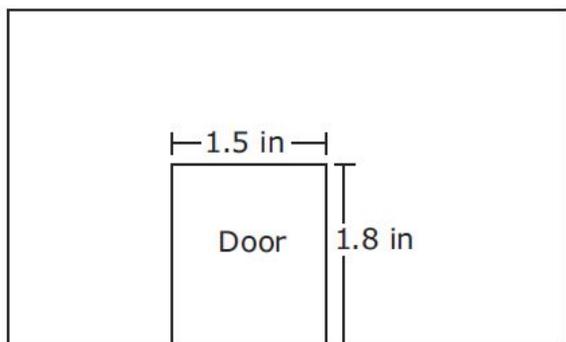
The student solves problems involving scale drawings using proportional reasoning.

Question Type 1: The student is presented with information about the area and/or dimensions of a scale drawing, including the scale factor.

1. The front side of a playhouse is shown in this scale drawing. The height of the door in the drawing is 1.8 inches.

The scale that maps the drawing to the actual playhouse is 1 inch to 2.5 feet.

Scale Drawing of the Playhouse



Using the scale given, enter the actual height, in feet, of the playhouse door.

Rubric: (1 point) Correct answer is a single numeric answer (e.g., 4.5).

Response Type: Equation/Numeric

Claim 1 7.G.A.1 DOK Level 2

Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.

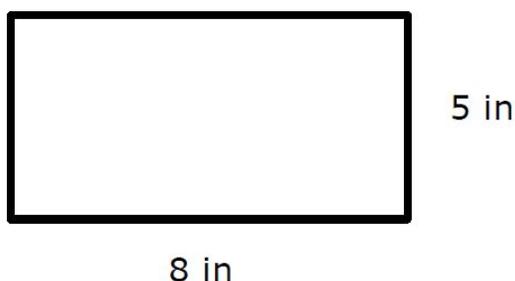
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Evidence Required

The student solves problems involving scale drawings using proportional reasoning.

Question Type 1: The student is presented with a scale drawing of a polygon (square, rectangle, or right triangle) with dimensions labeled and the dimension for one side of the actual polygon given.

1. This scale drawing of a rectangular rug has dimensions 8 inches by 5 inches. The length of the longer side of the actual rug is 32 feet.



Enter the area, in square feet, of the actual rug.

Rubric: (1 point) Correct answer is a single numeric answer. Units should be assumed from the stem (e.g., 640).

Response Type: Equation/Numeric

Claim 1 7.G.A.2 DOK Level 1

Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.

Evidence Required

The student draws, constructs, or describes geometric shapes given certain conditions.

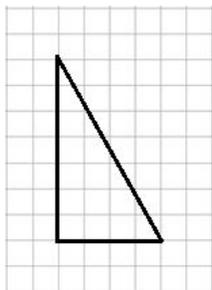
Question Type 1: The student is presented with a series of conditions regarding a triangle or quadrilateral. The conditions should determine a unique polygon, and measurements should be positive integers reasonable for display in the workspace provided.

1. Use the Connect Line tool to draw a triangle with a 90° angle, a side with a length of 7 units, and a side with a length of 4 units. Each square on the grid is 1 unit in length.

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Interaction: The student is given the Connect Line, Add Point, and Delete tools to generate line segments on a grid.

Rubric: (1 point) The student correctly constructs the figure described.



Response Type: Graphing

Claim 1 7.G.A.3 DOK Level 2

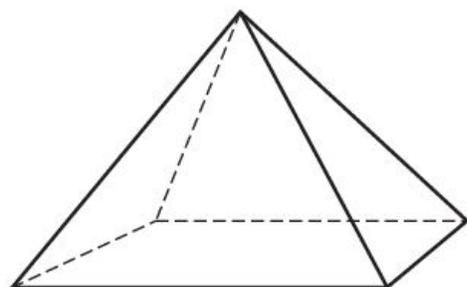
Describe the two-dimensional figures that result from slicing three-dimensional figures, as in plane sections of right-rectangular prisms and right-rectangular pyramids.

Evidence Required

The student describes a two-dimensional figure resulting from slicing a three-dimensional figure by a plane.

Question Type 1: The student is presented with a three-dimensional figure and a description of how the figure is sliced by a plane.

1. This figure is a square pyramid.



Select all figures that can be formed by a vertical slice perpendicular to the base of the square pyramid.

A. Isosceles Trapezoid

- B. Line segment
- C. Square
- D. Triangle

Answer Choices: Answer choices will be names of polygons and can also include line segment as a choice.

Rubric: (1 point) Student selects the correct figures (e.g., A, B, and D).

Response Type: Multiple Choice, multiple correct response