

Grade 6 Mathematics Item Specification C1 TH		
Task Model 1	<b>Prompt Features:</b> The student is prompted to determine the areas	
	of triangles in solving mathematical and real-world problems.	
Response Type:	Stimulus Guidelines	
Equation/ Numeric	• If used context should be familiar to students 11 to 13 years	
DOK Level 1	old	
	<ul> <li>Rational numbers used should be appropriate for the</li> </ul>	
6.G.A.1	situation.	
Find the area of right	• Item difficulty can be adjusted via these example methods:	
triangles, other	<ul> <li>Measurements of shapes can be whole numbers,</li> </ul>	
triangles, special	fractions, or decimals.	
quadrilaterals, and	<ul> <li>Students find the area of right triangles.</li> </ul>	
polygons by	<ul> <li>Students find the area of non-right triangles such as</li> </ul>	
composing into	isosceles triangle, equilateral triangle, or scalene	
rectangles or	triangle.	
decomposing into	TM1a	
shapes, apply these	Stimulus: The student is presented with a mathematical problem	
techniques in the	involving triangles	
context of solving		
real-world and	<b>Example Stem:</b> Consider this figure.	
mathematical		
problems.		
	5m	
Evidence De guine de		
<b>Requirea:</b>		
determines the area		
of triangles, special	Enter the area of the right triangle in square motors	
quadrilaterals, and		
polygons using	<b>Rubric:</b> (1 point) Student enters the correct area of the figure (e.g.,	
composition and	20). Correct answer should be a single numerical value and units	
aecomposition in	should be assumed from the stem.	
and mathematical		
problems.	<b>kesponse Type:</b> Equation/Numeric	
Tools: Calculator		



Grade 6 Mathemat	cics Item Specification C1 TH
Task Model 1	<b>Prompt Features:</b> The student is prompted to determine the areas
	of triangles, special quadrilaterals, and other polygons in solving
Response Type:	mathematical and real-world problems.
Equation/Numeric	
	Stimulus Guidelines:
DOK Level 2	• If used, context should be familiar to students 11 to 13 years
	old.
6.G.A.1	<ul> <li>Rational numbers used should be appropriate for the</li> </ul>
Find the area of right	situation.
triangles, other	• Item difficulty can be adjusted via these example methods:
triangles, special	<ul> <li>Students find area of non-right triangles/special</li> </ul>
quadrilaterals, and	quadrilaterals with whole-number measures.
polygons by	• Students find area of polygon that can be decomposed
composing into	into quadrilaterals and triangles with whole number
rectangles or	measures.
decomposing into	<ul> <li>Students find area of triangles/special quadrilaterals</li> </ul>
triangles and other	with fraction/decimal measures.
shapes; apply these	<ul> <li>Students find area of polygon that can be decomposed</li> </ul>
techniques in the	into quadrilaterals and triangles with fraction/decimal
context of solving	measures.
real-world and	
mathematical	
problems.	<b>Stimulus:</b> The student is presented with a mathematical or real-
Evidence	world problem involving composition or decomposition of a triangle,
Evidence	special quadrilateral, or other polygon.
1 The student	Example Stem 1. Consider this figure
determines the area	
of triangles special	B ∧
quadrilaterals, and	
polygons using	8 cm
composition and	
decomposition in	
solving real-world	$A \xrightarrow{6 \text{ cm}} E \xrightarrow{15 \text{ cm}} C$
and mathematical	
problems.	8 cm
Tools: Calculator	
	D
Accessibility Note:	
diagrama clearly	Enter the total area, in square centimeters, of kite ABCD.
indicate dimensions	
Where reasonable	<b>Example Stem 2:</b> Figure A is composed of two shapes.
include the	<ul> <li>A rectangle with length 9 inches and width 2 inches</li> </ul>
dimensions in the	A square with side length 3 inches
stem.	3 in
	3 in
	2 in
	Qin
	9 10
	Figure A
	Enter the total area, in square inches, of the Figure A.



**Rubric:** (1 point) Student enters the correct area of the figure (e.g., 168; 27). Correct answer should be a single numerical value and units should be assumed from the stem.

### **Response Type:** Equation/Numeric

Task Model 2	<b>Prompt Features:</b> The student is prompted to determine the volume of a right rectangular prism by applying the formulas
Response Type: Equation/Numeric	V = lwh and $V = bh$ .
	Stimulus Guidelines:
DOK Level 1	<ul> <li>If used, context should be familiar to students 11 to 13 years old.</li> </ul>
<b>6.G.A.2</b> Find the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes of the appropriate unit fraction edge lengths, and show that the volume is the same as would be found by multiplying the edge lengths of the prism. Apply the formulas $V = lwh$ and $V = bh$ to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems.	<ul> <li>Item difficulty can be adjusted via these example methods:         <ul> <li>Students find volume of rectangular prism with one side measure expressed as fraction/mixed number in halves or fourths.</li> <li>Students find volume of rectangular prism with one side measure expressed as fraction/mixed number.</li> <li>Students find volume of rectangular prism with all side measures expressed as fractions/mixed numbers.</li> </ul> </li> <li>TM2a Stimulus: The student is presented with a right rectangular prism with fractional edge lengths in the context of a mathematical or real-world problem.</li> <li>Example Stem: Consider this figure.</li> <li>Int 11 1/2 in</li> <li>Int 11 1/2 in</li> </ul>
<b>Evidence</b> <b>Required:</b> 2. The student determines the volume of right rectangular prisms with fractional edge lengths in solving real-world and mathematical problems.	Rubric: (1 point) Student enters the correct volume (e.g., 2300). Correct answer should be a single numerical value and units should be assumed from the stem. Response Type: Equation/Numeric

Tools: Calculator



side

Task Model 2 Response Type:	<b>Prompt Features:</b> The student is prompted to determine the volume of a compound figure composed of right rectangular prisms by applying the formulas $V = lwh$ and $V = bh$ .
Equation/ Numeric	Stimulus Guidelines:
DOK Level 2	• If used, context should be familiar to students 11 to 13 years old.
<b>6.G.A.2</b> Find the volume of a right rectangular prism with fractional	<ul> <li>Item difficulty can be adjusted via these example methods:         <ul> <li>Use whole-numbers, fractions, or decimals for the side measurements.</li> </ul> </li> </ul>
edge lengths by	TM2b
packing it with unit cubes of the appropriate unit fraction edge	<b>Stimulus:</b> The student is presented with a compound figure composed of right rectangular prisms in the context of a mathematical or real-world problem.
lengths, and show	Example Stem: This figure was created by joining two right
that the volume is	rectangular prisms.
the same as would	8.5 ft
be found by multiplying the edge lengths of the prism. Apply the formulas V = lwh and $V = bhto find volumes ofright rectangularprisms withfractional edge$	6  ft 3  ft 4  ft 9.5  ft 4  ft
lengths in the	Enter the volume, in cubic feet, of the figure.
context of solving real-world and mathematical problems.	<b>Rubric:</b> (1 point) Student enters the correct volume (e.g., 309). Correct answer should be a single numerical value and units should be assumed from the stem.
<b>Evidence</b> <b>Required:</b> 2. The student determines the volume of right rectangular prisms with fractional edge lengths in solving real-world and	Response Type: Equation/Numeric

Tools: Calculator

mathematical problems.



Task Model 3	Prompt Features: The student is prompted to draw polygons in the
	coordinate plane given coordinates for the vertices.
Response Type:	
Graphing	Stimulus Guidelines:
	• If used, context should be familiar to students 11 to 13 years
DOK Level 1	old.
	<ul> <li>Polygons should be limited to triangles, squares, rectangles,</li> </ul>
6.G.A.3	parallelograms, kites, rhombi, and trapezoids.
Draw polygons in the	<ul> <li>Coordinates of the ordered pairs should be integers.</li> </ul>
coordinate plane	• Item difficulty can be adjusted via these example methods:
given coordinates for	<ul> <li>Students graph polygon in Quadrant I with one-unit</li> </ul>
the vertices; use	Increment axes.
the length of a side	<ul> <li>Students graph polygon in all four quadrants with</li> </ul>
ioining points with	Offe-unit increment axes.
the same first	<ul> <li>Students graph polygon in an four quadrants with varving integer increment aves</li> </ul>
coordinate or the	varying integer increment axes.
same second	тмз
coordinate. Apply	<b>Stimulus:</b> The student is presented with the vertices of a polygon in
these techniques in	the context of a real-world or mathematical problem.
the context of	
solving real-world	<b>Example Stem:</b> Consider these ordered pairs.
and mathematical	
problems.	Point A: (3, 2)
	Point B: (-3, 2)
Evidence	Point C: (3, -2)
Required:	
3. The student draws	У у
polygons in the	8
coordinate plane,	6-
given coordinates for	
context of colving	
real-world and	
mathematical	
problems	
problems.	
Tools: Calculator	-6-
	-8-
Accessibility Note:	
Graphing items are	
not currently able to	Use the Connect Line tool to form triangle ABC.
be Brailled. Minimize	Treasantian. The student is given the Connect Line. Add Daint, and
the number of items	Delete teals to draw the polygon in the coordinate plane
developed to this	Delete tools to draw the polygon in the coordinate plane.
TM.	<b>Rubric:</b> (1 point) Student plots all given points and connects the
	lines correctly.
	Response Type: Graphing



Task Model 4

**Response Type:** Equation/Numeric

DOK Level 2

# 6.G.A.3

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

#### Evidence Required:

4. The student determines the length of a side of a polygon in the coordinate plane, given coordinates for the vertices in the context of solving real-world and mathematical problems.

Tools: Calculator

**Prompt Features:** The student is prompted to determine the length of a side of a polygon in the coordinate plane given coordinates for the vertices that have the same first coordinate or the same second coordinate.

## **Stimulus Guidelines:**

- If used, context should be familiar to students 11 to 13 years old.
- Polygons should be limited to triangles, squares, rectangles, parallelograms, kites, rhombi, and trapezoids.
- Coordinates of the ordered pairs should be integers.
- Item difficulty can be adjusted via these example methods:
  - $\,\circ\,$  Coordinates of the side used are in the same quadrant.
  - $\,\circ\,$  Coordinates of the side used are in different quadrants.

### TM4

**Stimulus:** The student is presented with coordinates for the side of a polygon in the coordinate plane with either the same first coordinate or the same second coordinate in the context of a mathematical or real-world problem.

**Example Stem 1:** A triangle has these coordinates:

Point A: (-5, 2) Point B: (-5, 6) Point C: (7, 2)

Enter the length of side AC.

**Example Stem 2:** Refer to the map as a coordinate grid. On the map, the library is located at (-5, 2), the bus station is located at (-5, 6), and the courthouse is located at (7, 2). Each square unit in the grid represents 1 square kilometer.



Enter the distance, in kilometers, from the courthouse to the library.

**Rubric:** (1 point) Student enters the correct length (e.g., 12; 12). Correct answer should be a single numerical value and units should be assumed from the stem.

**Response Type:** Equation/Numeric



**Response Type: Equation/Numeric** 

Task Model 5

DOK Level 2

Represent three-

of rectangles and

triangles, and use

context of solving

real-world and

mathematical problems.

the nets to find the

surface area of these figures. Apply these techniques in the

dimensional figures

using nets made up

6.G.A.4

### Stimulus Guidelines:

- If used, context should be familiar to students 11 to 13 years old.
- Rational numbers used should be appropriate for the situation.

surface area of a three-dimensional figure formed from a net.

- Item difficulty can be adjusted via these example methods:
  - Students find surface area of polygon with all side measures expressed as whole numbers.
  - Students find surface area of polygon with some side 0 measures expressed as decimals.
  - Students find surface area of polygon with some side measures expressed as fractions/mixed numbers.

#### TM5

Stimulus: The student is presented with a net composed of rectangles, triangles, or a combination of the two in the context of a real-world or mathematical problem.

**Example Stem:** Susan is painting the outside of a square pyramid. The net for the pyramid is shown.

