Area Volume and Surface Area

Lesson 4 Composite Polygon Areas

Standards 6.G.A.1

Learning target I can decompose a polygon into familiar shapes to find area.

Materials Rulers, grid paper, unit cubes or paper cube models, paper and scissors for nets.

Lesson Flow 50 Minutes

0–5 Activate prior knowledge. Read the learning target. Ask students what they already know about composite polygon areas. Use a quick model or estimate to make their starting ideas visible.

5–17 Teach and model. Sketch the figure and label every given length. Split the region into nonoverlapping rectangles and triangles, or subtract a cutout from a larger rectangle. Add only the areas that belong to the figure. Work through the two examples on the attached instruction page. Have students name the first step before showing it.

17–22 Guided practice. Revisit worked Example 2 with its solution covered. Students propose the next step and explain why it is valid; uncover and compare with the worked solution.

22–45 Independent classwork. Assign the attached 10 questions in order. Check items 1–3 for entry-level understanding, 4–6 for connected procedures, 7–8 for representation and explanation, and 9–10 for application or justification. Ask students to use the instruction-page notes area or extra grids for longer work.

45–50 Check understanding. Use classwork question 10 as an exit discussion: A 6 m by 8 m rectangle has a right-triangle corner removed with perpendicular legs 2 m and 6 m. Sketch the remaining polygon and find its area. Compare the result with the answer key and ask a student to defend the method.

Support and Extension

Support Model item 1 together with the listed tools, then have students attempt item 2 independently. Watch perpendicular height, missing faces, and square versus cubic units.

Extension Ask students to solve a final item another way, draw a second representation, or create a related problem with a checked answer.

Next step Record which students can explain the target independently. Begin the next teaching session with a brief correction for any recurring error.

Name _____ Date _____

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Learn and Discuss

Sketch the figure and label every given length. Split the region into nonoverlapping rectangles and triangles, or subtract a cutout from a larger rectangle. Add only the areas that belong to the figure.

Example 1 An L-shaped garden is a 7 m by 8 m rectangle with an 3 m by 4 m corner rectangle removed. Sketch and find the garden area.
Solution 44 m². Outer area 56 minus cutout 12 = 44.
Example 2 A 8 m by 4 m rectangle has a right-triangle corner removed with perpendicular legs 2 m and 2 m. Sketch the remaining polygon and find its area.
Solution 30 m². Whole rectangle 32; remove triangle 2; difference 30.

Classwork Show Your Work

Complete the 10 problems on the following page. Refer to the examples, draw models, and check your results.

My Notes or Second Method

Lesson 4 Composite Polygon Areas

Name _____ Show calculations, models, and units.

1. An L-shaped garden is a 14 m by 9 m rectangle with an 8 m by 3 m corner rectangle removed. Sketch and find the garden area.

2. An L-shaped garden is a 8 m by 10 m rectangle with an 4 m by 6 m corner rectangle removed. Sketch and find the garden area.

3. An L-shaped garden is a 13 m by 8 m rectangle with an 7 m by 2 m corner rectangle removed. Sketch and find the garden area.

4. An L-shaped garden is a 13 m by 10 m rectangle with an 7 m by 4 m corner rectangle removed. Sketch and find the garden area.

5. An L-shaped garden is a 5 m by 4 m rectangle with an 3 m by 2 m corner rectangle removed. Sketch and find the garden area.

6. An L-shaped garden is a 7 m by 11 m rectangle with an 3 m by 7 m corner rectangle removed. Sketch and find the garden area.

7. A 4 m by 6 m rectangle has a right-triangle corner removed with perpendicular legs 2 m and 4 m. Sketch the remaining polygon and find its area.

8. A 13 m by 9 m rectangle has a right-triangle corner removed with perpendicular legs 6 m and 3 m. Sketch the remaining polygon and find its area.

9. A 13 m by 8 m rectangle has a right-triangle corner removed with perpendicular legs 6 m and 2 m. Sketch the remaining polygon and find its area.

10. A 6 m by 8 m rectangle has a right-triangle corner removed with perpendicular legs 2 m and 6 m. Sketch the remaining polygon and find its area.

Composite Polygon Areas

Area Volume and Surface Area

1. 102 m²
Reasoning Outer area 126 minus cutout 24 = 102.

2. 56 m²
Reasoning Outer area 80 minus cutout 24 = 56.

3. 90 m²
Reasoning Outer area 104 minus cutout 14 = 90.

4. 102 m²
Reasoning Outer area 130 minus cutout 28 = 102.

5. 14 m²
Reasoning Outer area 20 minus cutout 6 = 14.

6. 56 m²
Reasoning Outer area 77 minus cutout 21 = 56.

7. 20 m²
Reasoning Whole rectangle 24; remove triangle 4; difference 20.

8. 108 m²
Reasoning Whole rectangle 117; remove triangle 9; difference 108.

9. 98 m²
Reasoning Whole rectangle 104; remove triangle 6; difference 98.

10. 42 m²
Reasoning Whole rectangle 48; remove triangle 6; difference 42.