Area Volume and Surface Area

Lesson 3 Parallelograms and Trapezoids

Standards 6.G.A.1

Learning target I can find parallelogram and trapezoid areas by rearranging shapes.

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 parallelograms and trapezoids. Use a quick model or estimate to make their starting ideas visible.

5–17 Teach and model. Cut and move a corner of a parallelogram to make a rectangle: A = bh. Two matching trapezoids form a parallelogram, giving A = (b1 + b2)h/2. Heights must be perpendicular. 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 trapezoid has parallel bases 12 m and 24 m and perpendicular height 4 m. Sketch it 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

Cut and move a corner of a parallelogram to make a rectangle: A = bh. Two matching trapezoids form a parallelogram, giving A = (b1 + b2)h/2. Heights must be perpendicular.

Example 1 A parallelogram has base 7 m and perpendicular height 6 m. Sketch how it can be rearranged into a rectangle and find its area.
Solution 42 m². Cut and shift a corner; A = bh = 7 × 6 = 42.
Example 2 A trapezoid has parallel bases 14 m and 20 m and perpendicular height 6 m. Sketch it and find its area.
Solution 102 m². A = (14 + 20) × 6 ÷ 2 = 102.

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 3 Parallelograms and Trapezoids

Name _____ Show calculations, models, and units.

1. A parallelogram has base 3 m and perpendicular height 4 m. Sketch how it can be rearranged into a rectangle and find its area.

2. A parallelogram has base 7 m and perpendicular height 5 m. Sketch how it can be rearranged into a rectangle and find its area.

3. A parallelogram has base 2 m and perpendicular height 4 m. Sketch how it can be rearranged into a rectangle and find its area.

4. A trapezoid has parallel bases 10 m and 22 m and perpendicular height 3 m. Sketch it and find its area.

5. A trapezoid has parallel bases 10 m and 20 m and perpendicular height 7 m. Sketch it and find its area.

6. A trapezoid has parallel bases 6 m and 18 m and perpendicular height 3 m. Sketch it and find its area.

7. A trapezoid has parallel bases 12 m and 22 m and perpendicular height 5 m. Sketch it and find its area.

8. A trapezoid has parallel bases 4 m and 10 m and perpendicular height 5 m. Sketch it and find its area.

9. A trapezoid has parallel bases 16 m and 28 m and perpendicular height 6 m. Sketch it and find its area.

10. A trapezoid has parallel bases 12 m and 24 m and perpendicular height 4 m. Sketch it and find its area.

Parallelograms and Trapezoids

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1. 12 m²
Reasoning Cut and shift a corner; A = bh = 3 × 4 = 12.

2. 35 m²
Reasoning Cut and shift a corner; A = bh = 7 × 5 = 35.

3. 8 m²
Reasoning Cut and shift a corner; A = bh = 2 × 4 = 8.

4. 48 m²
Reasoning A = (10 + 22) × 3 ÷ 2 = 48.

5. 105 m²
Reasoning A = (10 + 20) × 7 ÷ 2 = 105.

6. 36 m²
Reasoning A = (6 + 18) × 3 ÷ 2 = 36.

7. 85 m²
Reasoning A = (12 + 22) × 5 ÷ 2 = 85.

8. 35 m²
Reasoning A = (4 + 10) × 5 ÷ 2 = 35.

9. 132 m²
Reasoning A = (16 + 28) × 6 ÷ 2 = 132.

10. 72 m²
Reasoning A = (12 + 24) × 4 ÷ 2 = 72.