Final Applications and Review

Lesson 1 Designing a School Garden

Standards 6.G.A.3, 6.G.A.1

Learning target I can use coordinates and polygon areas to plan a garden.

Materials Coordinate grids, rulers, fractional cube models, data plotting paper.

Lesson Flow 50 Minutes

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

5–17 Teach and model. Read the requested quantity first and identify the relevant model. Plot vertices in order and connect them, including the last to the first. Equal x-values make a vertical side; equal y-values make a horizontal side. Count or subtract coordinates to get the side lengths. Explain why the units and the final value fit the situation. 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: Sketch a triangle with base 14 cm and perpendicular height 7/2 cm. Find its area. Explain why the slanted side is not needed. 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 choosing the correct geometric measure and tying statistical statements to units and context.

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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Learning target I can use coordinates and polygon areas to plan a garden.

Learn and Discuss

Read the requested quantity first and identify the relevant model. Plot vertices in order and connect them, including the last to the first. Equal x-values make a vertical side; equal y-values make a horizontal side. Count or subtract coordinates to get the side lengths. Explain why the units and the final value fit the situation.

Example 1 Sketch a triangle with base 4 cm and perpendicular height 6 cm. Find its area.
Solution 12 cm². A = bh/2 = 4 × 6 ÷ 2 = 12. Two such triangles make a parallelogram.
Example 2 A trapezoid has parallel bases 12 m and 22 m and perpendicular height 4 m. Sketch it and find its area.
Solution 68 m². A = (12 + 22) × 4 ÷ 2 = 68.

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 1 Designing a School Garden

Name _____ Show calculations, models, and units.

1. Plot and connect (0,0), (10,0), (10,9), (0,9). Find the side lengths and area.

2. Sketch a triangle with base 12 cm and perpendicular height 2 cm. Find its area.

3. An L-shaped garden is a 12 m by 9 m rectangle with an 8 m by 5 m corner rectangle removed. Sketch and find the garden area.

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

5. Plot and connect (-2,-3), (5,-3), (5,5), (-2,5). Find the side lengths and area.

6. Sketch a triangle with base 6 cm and perpendicular height 7 cm. Find its area.

7. A 10 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.

8. A trapezoid has parallel bases 10 m and 16 m and perpendicular height 2 m. Sketch it and find its area.

9. Plot and connect (-7,-6), (3,-6), (3,3), (-7,3). Find the side lengths and area. Find the perimeter too.

10. Sketch a triangle with base 14 cm and perpendicular height 7/2 cm. Find its area. Explain why the slanted side is not needed.

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1. Sides 10 and 9; area 90 square units
Reasoning Horizontal length 10 - (0) = 10; vertical length 9 - (0) = 9; area = 10 × 9.

2. 12 cm²
Reasoning A = bh/2 = 12 × 2 ÷ 2 = 12. Two such triangles make a parallelogram.

3. 68 m²
Reasoning Outer area 108 minus cutout 40 = 68.

4. 64 m²
Reasoning A = (10 + 22) × 4 ÷ 2 = 64.

5. Sides 7 and 8; area 56 square units
Reasoning Horizontal length 5 - (-2) = 7; vertical length 5 - (-3) = 8; area = 7 × 8.

6. 21 cm²
Reasoning A = bh/2 = 6 × 7 ÷ 2 = 21. Two such triangles make a parallelogram.

7. 81 m²
Reasoning Whole rectangle 90; remove triangle 9; difference 81.

8. 26 m²
Reasoning A = (10 + 16) × 2 ÷ 2 = 26.

9. Sides 10 and 9; area 90 square units; perimeter 38 units
Reasoning Horizontal length 3 - (-7) = 10; vertical length 3 - (-6) = 9; area = 10 × 9.

10. 49/2 cm²
Reasoning A = bh/2 = 14 × 7/2 ÷ 2 = 49/2. Two such triangles make a parallelogram.