Area Volume and Surface Area

Lesson 9 Drawing and Labeling Nets

Standards 6.G.A.4

Learning target I can draw a net and account for every face of a solid.

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 drawing and labeling nets. Use a quick model or estimate to make their starting ideas visible.

5–17 Teach and model. A net unfolds all faces into a plane without overlap. Rectangular prisms have three matching pairs of rectangles. Pyramids have a polygonal base and triangular sides. Add face areas, not edge lengths. 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: Draw a net for a triangular prism. Its two congruent right-triangle bases have legs 3 cm and 4 cm and hypotenuse 5 cm; prism length is 3 cm. Label all faces and find surface 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

A net unfolds all faces into a plane without overlap. Rectangular prisms have three matching pairs of rectangles. Pyramids have a polygonal base and triangular sides. Add face areas, not edge lengths.

Example 1 Draw a net for a closed 3 × 4 × 5 cm rectangular prism. Label the six faces and calculate total area.
Solution 2 faces each of 3×4, 3×5, 4×5; 94 cm². Add 2(12) + 2(15) + 2(20) = 94.
Example 2 Draw a net for a triangular prism. Its two congruent right-triangle bases have legs 3 cm and 4 cm and hypotenuse 5 cm; prism length is 5 cm. Label all faces and find surface area.
Solution 2 triangles (area 6 each), rectangles 3×5, 4×5, 5×5; SA 72 cm². Triangle pair: 12 cm²; rectangles: (3+4+5) × 5 = 60; total 72.

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 9 Drawing and Labeling Nets

Name _____ Show calculations, models, and units.

1. Draw a net for a closed 5 × 5 × 4 cm rectangular prism. Label the six faces and calculate total area.

2. Draw a net for a closed 3 × 3 × 2 cm rectangular prism. Label the six faces and calculate total area.

3. Draw a net for a closed 7 × 3 × 3 cm rectangular prism. Label the six faces and calculate total area.

4. Draw a net for a closed 2 × 4 × 3 cm rectangular prism. Label the six faces and calculate total area.

5. Draw a net for a closed 2 × 2 × 4 cm rectangular prism. Label the six faces and calculate total area.

6. Draw a net for a closed 6 × 7 × 2 cm rectangular prism. Label the six faces and calculate total area.

7. Draw a net for a triangular prism. Its two congruent right-triangle bases have legs 3 cm and 4 cm and hypotenuse 5 cm; prism length is 5 cm. Label all faces and find surface area.

8. Draw a net for a triangular prism. Its two congruent right-triangle bases have legs 3 cm and 4 cm and hypotenuse 5 cm; prism length is 4 cm. Label all faces and find surface area.

9. Draw a net for a triangular prism. Its two congruent right-triangle bases have legs 3 cm and 4 cm and hypotenuse 5 cm; prism length is 8 cm. Label all faces and find surface area.

10. Draw a net for a triangular prism. Its two congruent right-triangle bases have legs 3 cm and 4 cm and hypotenuse 5 cm; prism length is 3 cm. Label all faces and find surface area.

Drawing and Labeling Nets

Area Volume and Surface Area

1. 2 faces each of 5×5, 5×4, 5×4; 130 cm²
Reasoning Add 2(25) + 2(20) + 2(20) = 130.

2. 2 faces each of 3×3, 3×2, 3×2; 42 cm²
Reasoning Add 2(9) + 2(6) + 2(6) = 42.

3. 2 faces each of 7×3, 7×3, 3×3; 102 cm²
Reasoning Add 2(21) + 2(21) + 2(9) = 102.

4. 2 faces each of 2×4, 2×3, 4×3; 52 cm²
Reasoning Add 2(8) + 2(6) + 2(12) = 52.

5. 2 faces each of 2×2, 2×4, 2×4; 40 cm²
Reasoning Add 2(4) + 2(8) + 2(8) = 40.

6. 2 faces each of 6×7, 6×2, 7×2; 136 cm²
Reasoning Add 2(42) + 2(12) + 2(14) = 136.

7. 2 triangles (area 6 each), rectangles 3×5, 4×5, 5×5; SA 72 cm²
Reasoning Triangle pair: 12 cm²; rectangles: (3+4+5) × 5 = 60; total 72.

8. 2 triangles (area 6 each), rectangles 3×4, 4×4, 5×4; SA 60 cm²
Reasoning Triangle pair: 12 cm²; rectangles: (3+4+5) × 4 = 48; total 60.

9. 2 triangles (area 6 each), rectangles 3×8, 4×8, 5×8; SA 108 cm²
Reasoning Triangle pair: 12 cm²; rectangles: (3+4+5) × 8 = 96; total 108.

10. 2 triangles (area 6 each), rectangles 3×3, 4×3, 5×3; SA 48 cm²
Reasoning Triangle pair: 12 cm²; rectangles: (3+4+5) × 3 = 36; total 48.