Final Applications and Review

Lesson 2 Planning Storage and Packaging

Standards 6.G.A.2, 6.G.A.4

Learning target I can connect volume and nets to compare storage designs.

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 planning storage and packaging. 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. A rectangular prism has volume V = lwh = Bh, where B is base area. Fractional edge lengths still multiply. Use cubic units; surface area and volume measure different attributes. 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: A square pyramid has base edge 6 cm. Each triangular face has perpendicular face height 10 cm. Draw a net and calculate total surface area. Explain why the vertical pyramid height 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 connect volume and nets to compare storage designs.

Learn and Discuss

Read the requested quantity first and identify the relevant model. A rectangular prism has volume V = lwh = Bh, where B is base area. Fractional edge lengths still multiply. Use cubic units; surface area and volume measure different attributes. Explain why the units and the final value fit the situation.

Example 1 Fill a prism 3/2 × 2 × 1 units with cubes of edge 1/2 unit. How many cubes fit? Use their volumes to verify lwh.
Solution 24 cubes; each 1/8 cubic unit; prism 3 cubic units. Counts along edges: 3, 4, 2. Product 24; 24 × 1/8 = 3, also lwh.
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 8 cm. Label all faces and find surface area.
Solution 2 triangles (area 6 each), rectangles 3×8, 4×8, 5×8; SA 108 cm². Triangle pair: 12 cm²; rectangles: (3+4+5) × 8 = 96; total 108.

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 2 Planning Storage and Packaging

Name _____ Show calculations, models, and units.

1. A rectangular prism has edges 7, 2, and 6 cm. Sketch it and find its volume.

2. Fill a prism 5/2 × 7/2 × 2 units with cubes of edge 1/2 unit. How many cubes fit? Use their volumes to verify lwh.

3. Draw a net for a closed 8 × 3 × 5 cm rectangular prism. Label the six faces and calculate total area.

4. A 5 cm by 6 cm base and 5 cm height form a closed box. Draw its net and find the material area. Ignore tabs and overlap.

5. A square pyramid has base edge 10 cm. Each triangular face has perpendicular face height 12 cm. Draw a net and calculate total surface area.

6. A rectangular prism has edges 4, 1 1/2, and 3 cm. Sketch it and find its volume.

7. Fill a prism 2/3 × 1 × 2 units with cubes of edge 1/3 unit. How many cubes fit? Use their volumes to verify lwh.

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 2 cm. Label all faces and find surface area.

9. A 8 cm by 7 cm base and 6 cm height form an open-top box. Draw its net and find the material area. Ignore tabs and overlap.

10. A square pyramid has base edge 6 cm. Each triangular face has perpendicular face height 10 cm. Draw a net and calculate total surface area. Explain why the vertical pyramid height is not needed.

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1. 84 cm³
Reasoning B = 7 × 2 = 14 cm²; V = B × 6 = 84 cm³.

2. 140 cubes; each 1/8 cubic unit; prism 35/2 cubic units
Reasoning Counts along edges: 5, 7, 4. Product 140; 140 × 1/8 = 35/2, also lwh.

3. 2 faces each of 8×3, 8×5, 3×5; 158 cm²
Reasoning Add 2(24) + 2(40) + 2(15) = 158.

4. 170 cm²
Reasoning Closed surface area = 2(30+25+30) = 170.

5. 340 cm²
Reasoning Base = 100; each triangle = 10 × 12 ÷ 2 = 60; add four triangles to get 340.

6. 18 cm³
Reasoning B = 4 × 3/2 = 6 cm²; V = B × 3 = 18 cm³.

7. 36 cubes; each 1/27 cubic unit; prism 4/3 cubic units
Reasoning Counts along edges: 2, 3, 6. Product 36; 36 × 1/27 = 4/3, also lwh.

8. 2 triangles (area 6 each), rectangles 3×2, 4×2, 5×2; SA 36 cm²
Reasoning Triangle pair: 12 cm²; rectangles: (3+4+5) × 2 = 24; total 36.

9. 236 cm²
Reasoning Closed surface area = 2(56+48+42) = 292. Remove the top area 56: 236.

10. 156 cm²
Reasoning Base = 36; each triangle = 6 × 10 ÷ 2 = 30; add four triangles to get 156.