Area Volume and Surface Area

Lesson 10 Prism Surface Area

Standards 6.G.A.4

Learning target I can use a rectangular-prism net to find surface 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 prism surface area. Use a quick model or estimate to make their starting ideas visible.

5–17 Teach and model. A closed rectangular prism has two faces of area lw, two of lh, and two of wh. Add the six face areas: SA = 2lw + 2lh + 2wh. If a face is missing, do not include it. 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 8 cm by 5 cm base and 5 cm height form an open-top box. Draw its net and find the material area. Ignore tabs and overlap. 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 _____

Area Volume and Surface Area

Lesson 10 Prism Surface Area

Standards 6.G.A.4

Learning target I can use a rectangular-prism net to find surface area.

Learn and Discuss

A closed rectangular prism has two faces of area lw, two of lh, and two of wh. Add the six face areas: SA = 2lw + 2lh + 2wh. If a face is missing, do not include it.

Example 1 A 6 cm by 2 cm base and 2 cm height form a closed box. Draw its net and find the material area. Ignore tabs and overlap.
Solution 56 cm². Closed surface area = 2(12+12+4) = 56.
Example 2 A 7 cm by 5 cm base and 4 cm height form an open-top box. Draw its net and find the material area. Ignore tabs and overlap.
Solution 131 cm². Closed surface area = 2(35+28+20) = 166. Remove the top area 35: 131.

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 10 Prism Surface Area

Name _____ Show calculations, models, and units.

1. A 8 cm by 4 cm base and 5 cm height form a closed box. Draw its net and find the material area. Ignore tabs and overlap.

2. A 7 cm by 5 cm base and 6 cm height form a closed box. Draw its net and find the material area. Ignore tabs and overlap.

3. A 2 cm by 5 cm base and 6 cm height form a closed box. Draw its net and find the material area. Ignore tabs and overlap.

4. A 4 cm by 7 cm base and 4 cm height form a closed box. Draw its net and find the material area. Ignore tabs and overlap.

5. A 8 cm by 4 cm base and 4 cm height form a closed box. Draw its net and find the material area. Ignore tabs and overlap.

6. A 2 cm by 2 cm base and 2 cm height form a closed box. Draw its net and find the material area. Ignore tabs and overlap.

7. A 4 cm by 6 cm base and 4 cm height form an open-top box. Draw its net and find the material area. Ignore tabs and overlap.

8. A 6 cm by 6 cm base and 2 cm height form an open-top box. Draw its net and find the material area. Ignore tabs and overlap.

9. A 7 cm by 7 cm base and 4 cm height form an open-top box. Draw its net and find the material area. Ignore tabs and overlap.

10. A 8 cm by 5 cm base and 5 cm height form an open-top box. Draw its net and find the material area. Ignore tabs and overlap.

Prism Surface Area

Area Volume and Surface Area

1. 184 cm²
Reasoning Closed surface area = 2(32+40+20) = 184.

2. 214 cm²
Reasoning Closed surface area = 2(35+42+30) = 214.

3. 104 cm²
Reasoning Closed surface area = 2(10+12+30) = 104.

4. 144 cm²
Reasoning Closed surface area = 2(28+16+28) = 144.

5. 160 cm²
Reasoning Closed surface area = 2(32+32+16) = 160.

6. 24 cm²
Reasoning Closed surface area = 2(4+4+4) = 24.

7. 104 cm²
Reasoning Closed surface area = 2(24+16+24) = 128. Remove the top area 24: 104.

8. 84 cm²
Reasoning Closed surface area = 2(36+12+12) = 120. Remove the top area 36: 84.

9. 161 cm²
Reasoning Closed surface area = 2(49+28+28) = 210. Remove the top area 49: 161.

10. 170 cm²
Reasoning Closed surface area = 2(40+40+25) = 210. Remove the top area 40: 170.