Nets and Surface Area

Nets and surface area: Mistakes and missing information

Name _____ **Date** _____ **Score** _____ / 6

QUICK REVIEW

A net unfolds every outside face. Opposite faces of a rectangular prism are congruent, so $S = 2(lw + lh + wh)$. A cube with 2 cm edges has area $6(2 \times 2) = 24$ cm^2. For an open box, count one base and four walls, with no lid.

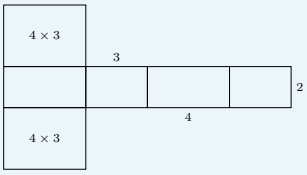
Worked example

Use the net to find total surface area. Dimensions are $4 \times 3 \times 2$ cm.

1. One face of each size: $4 \times 3 = 12$, $4 \times 2 = 8$, $3 \times 2 = 6$ cm^2.

2. Opposite faces are congruent: each pair has the same two edge lengths. Count each area twice: $2(12 + 8 + 6) = 52$ cm^2.

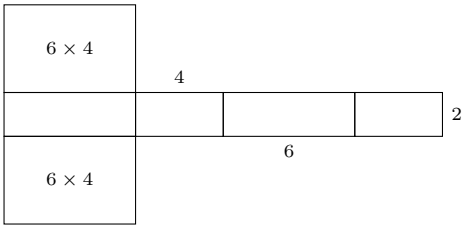
Answer: 52 cm^2.



Practice Problems

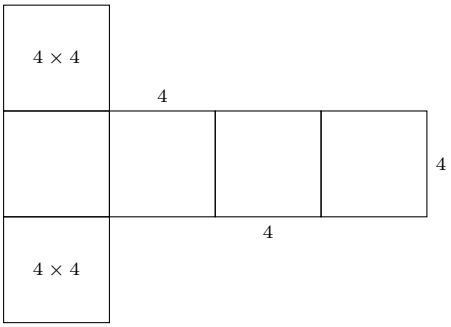
Show your thinking.

1. A student adds $l + w + h$ for surface area. Correct it. Dimensions are $6 \times 4 \times 2$ cm.

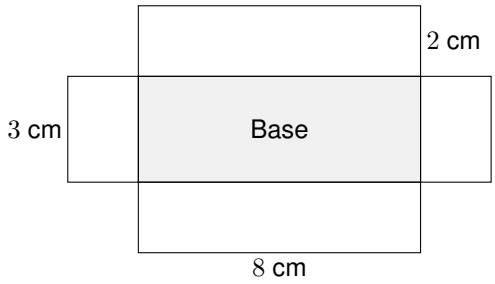


2. A closed box has surface area 62 cm^2. Its top is 10 cm^2 and its front is 15 cm^2. Find the area of one end face.

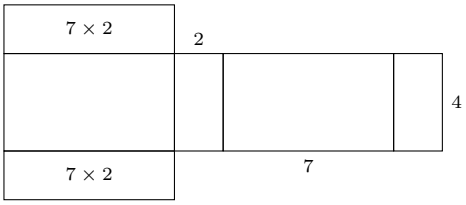
3. A student reports $4^3 = 64$ square cm. Correct the volume/surface-area mix-up. Dimensions are $4 \times 4 \times 4$ cm.



4. A student includes a lid when estimating cardboard for this open box. Find the correct area and how much the lid would add.



5. A student counts one of each face size only. Repair the total. Dimensions are $7 \times 2 \times 4$ cm.



6. A cube has surface area 216 cm^2. Recover its edge length and sketch a net with one edge labeled.

Answer Key

1. 88 cm^2.
2. 6 cm^2.
3. 96 cm^2.
4. 68 cm^2. A lid would add 24 cm^2.
5. 100 cm^2.
6. Edge 6 cm; a net of six 6 cm by 6 cm squares.

Step-by-Step Solutions

Follow each calculation, then check your own work.

Problem 1

1. One face of each size: $6 \times 4 = 24$, $6 \times 2 = 12$, $4 \times 2 = 8$ cm^2.

2. Opposite faces are congruent: each pair has the same two edge lengths. Count each area twice: $2(24 + 12 + 8) = 88$ cm^2.

Problem 2

1. Each face size occurs twice, so one of each size totals $62 \div 2 = 31$ cm^2.

2. The end face is $31 - 10 - 15 = 6$ cm^2. Check $2(10 + 15 + 6) = 62$ cm^2.

Problem 3

1. One face of each size: $4 \times 4 = 16$, $4 \times 4 = 16$, $4 \times 4 = 16$ cm^2.

2. Opposite faces are congruent: each pair has the same two edge lengths. Count each area twice: $2(16 + 16 + 16) = 96$ cm^2.

3. Equivalently, all six squares have area 16 cm^2, so $6 \times 16 = 96$ cm^2.

Problem 4

1. One base: $8 \times 3 = 24$ cm^2. There is no lid.

2. Two long walls: $2(8 \times 2) = 32$ cm^2. Two end walls: $2(3 \times 2) = 12$ cm^2.

3. Add all five faces: $24 + 32 + 12 = 68$ cm^2.

4. A lid would be a second base-sized face: $8 \times 3 = 24$ cm^2.

Problem 5

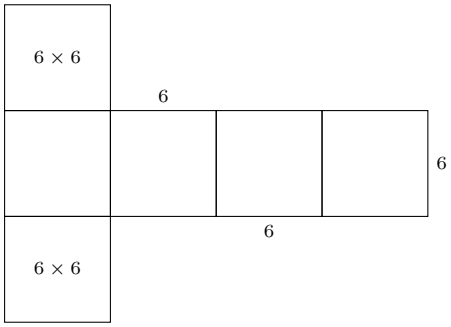
1. One face of each size: $7 \times 2 = 14$, $7 \times 4 = 28$, $2 \times 4 = 8$ cm^2.

2. Opposite faces are congruent: each pair has the same two edge lengths. Count each area twice: $2(14 + 28 + 8) = 100$ cm^2.

Problem 6

1. Each of the six squares has area $216 \div 6 = 36$ cm^2.

2. $6 \times 6 = 36$, so the edge is 6 cm. One possible net is shown; each edge labeled 6 measures 6 cm.



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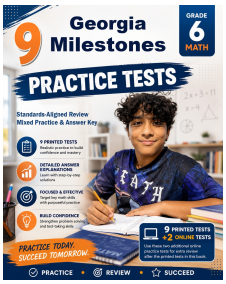

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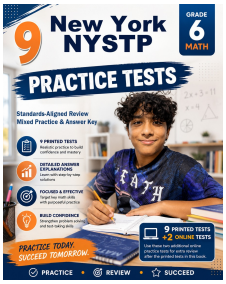

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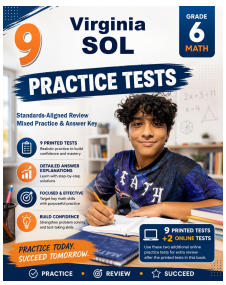

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