Nets and Surface Area

Nets and surface area: Models and calculations

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.

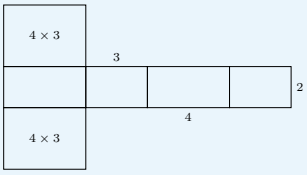
Worked example

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.

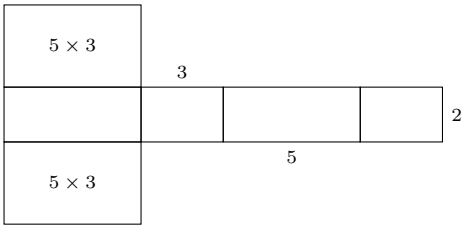
Answer: 52 cm^2.



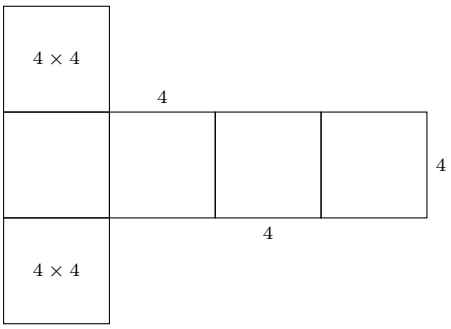
Practice Problems

Show your thinking.

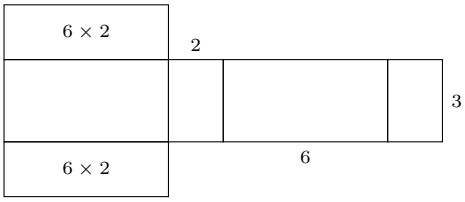
1. Find the area of all six faces. Dimensions are $5 \times 3 \times 2$ cm.



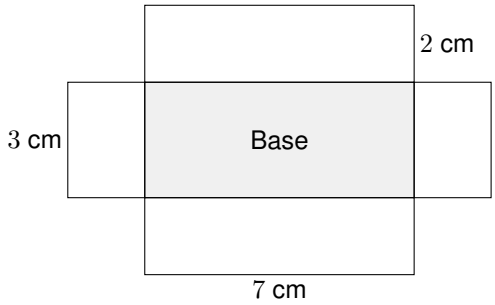
2. Model surface area as six equal squares. Dimensions are $4 \times 4 \times 4$ cm.



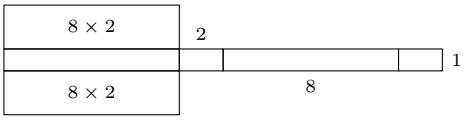
3. Explain why opposite face areas are counted twice, then calculate. Dimensions are $6 \times 2 \times 3$ cm.



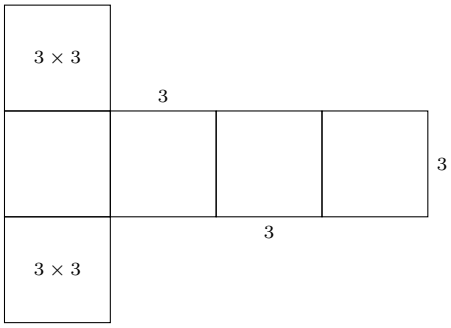
4. This five-face net folds into an open-top box with no lid. Find the cardboard area, ignoring tabs and overlap.



5. List the three different face areas before adding pairs. Dimensions are $8 \times 2 \times 1$ cm.



6. A student counts only four cube faces. Correct total surface area. Dimensions are $3 \times 3 \times 3$ cm.



Answer Key

1. 62 cm^2.
2. 96 cm^2.
3. 72 cm^2. Opposite faces have the same dimensions, so their areas occur in pairs.
4. 61 cm^2.
5. 52 cm^2.
6. 54 cm^2.

Step-by-Step Solutions

Follow each calculation, then check your own work.

Problem 1

1. One face of each size: $5 \times 3 = 15$, $5 \times 2 = 10$, $3 \times 2 = 6$ cm^2.

2. Opposite faces are congruent: each pair has the same two edge lengths. Count each area twice: $2(15 + 10 + 6) = 62$ cm^2.

Problem 2

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 3

1. One face of each size: $6 \times 2 = 12$, $6 \times 3 = 18$, $2 \times 3 = 6$ cm^2.

2. Opposite faces are congruent: each pair has the same two edge lengths. Count each area twice: $2(12 + 18 + 6) = 72$ cm^2.

Problem 4

1. One base: $7 \times 3 = 21$ cm^2. There is no lid.

2. Two long walls: $2(7 \times 2) = 28$ cm^2. Two end walls: $2(3 \times 2) = 12$ cm^2.

3. Add all five faces: $21 + 28 + 12 = 61$ cm^2.

Problem 5

1. One face of each size: $8 \times 2 = 16$, $8 \times 1 = 8$, $2 \times 1 = 2$ cm^2.

2. Opposite faces are congruent: each pair has the same two edge lengths. Count each area twice: $2(16 + 8 + 2) = 52$ cm^2.

Problem 6

1. One face of each size: $3 \times 3 = 9$, $3 \times 3 = 9$, $3 \times 3 = 9$ cm^2.

2. Opposite faces are congruent: each pair has the same two edge lengths. Count each area twice: $2(9 + 9 + 9) = 54$ cm^2.

3. Equivalently, all six squares have area 9 cm^2, so $6 \times 9 = 54$ cm^2.

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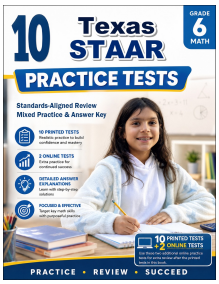

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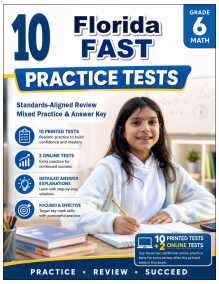

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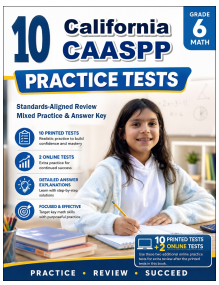

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