

# Net It Up

*Unfold, draw and use every face.*

**GRADE 6 • 6.G.A.4**

**CCSS.Math.Content.6.G.A.4** "Represent three-dimensional figures using nets made up of rectangles and triangles, and use the nets to find the surface area of these figures. Apply these techniques in the context of solving real-world and mathematical problems."

NAME \_\_\_\_\_

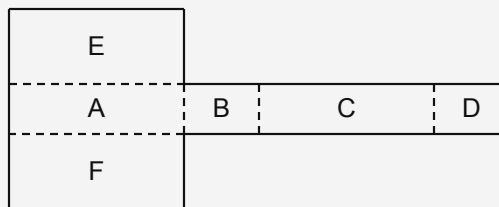
DATE \_\_\_\_\_

## READ THE WHOLE NET

A net is a flat arrangement of faces that can fold into a solid without overlap. Letters identify faces; use the dimension legend beneath each printed net. Dashed edges are folds. Surface area is the sum of all face areas: rectangles use length  $\times$  width, and triangles use half of base  $\times$  perpendicular height. Nets show which faces must be counted; equal-size faces still count separately.

## WORKED EXAMPLE

This net folds into a rectangular prism. Use every labeled face to find its surface area.



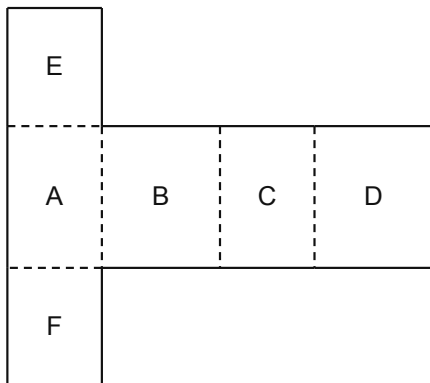
A/C:  $7 \times 2$ ; B/D:  $3 \times 2$ ; E/F:  $7 \times 3$  (cm). Dashed edges fold.

1. A and C each have area  $7 \times 2 = 14 \text{ cm}^2$ ; B and D each have area  $3 \times 2 = 6 \text{ cm}^2$ .
2. E and F each have area  $7 \times 3 = 21 \text{ cm}^2$ . The six faces make a closed prism.
3. Add all faces:  $2(14 + 6 + 21) = 82 \text{ cm}^2$ .

**Answer:  $82 \text{ cm}^2$**

## PRACTICE 4 problems

- 1** Name the three pairs of equal-area faces.  
Use the net to find the surface area.

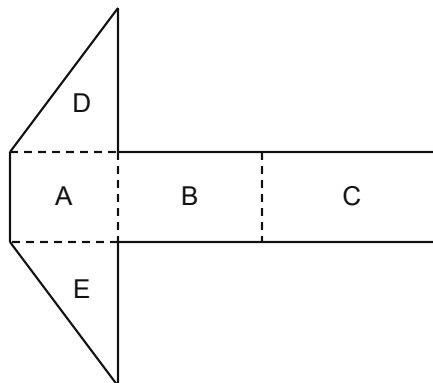


A/C:  $4 \times 6$ ; B/D:  $5 \times 6$ ; E/F:  $4 \times 5$  (cm). Dashed edges fold.

**ANSWER** \_\_\_\_\_

\_\_\_\_\_

- 2** Name the triangular and rectangular faces.  
Use the net to find surface area.

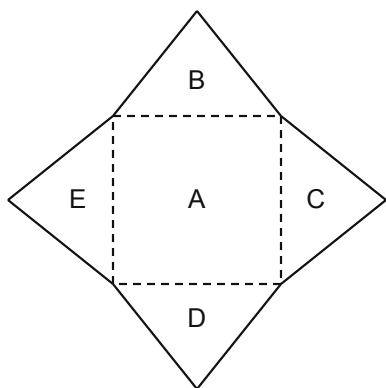


A:  $6 \times 5$ ; B:  $8 \times 5$ ; C:  $10 \times 5$ ; D/E: right triangle: legs 6, 8; third side 10 (cm). Dashed edges fold.

**ANSWER** \_\_\_\_\_

\_\_\_\_\_

- 3** Find surface area. Triangle altitudes are perpendicular to bases.



A:  $8 \times 8$ ; B/C/D/E: triangle: base 8, altitude 5 (cm). Dashed edges fold.

**ANSWER** \_\_\_\_\_

\_\_\_\_\_

- 4** Draw and label a net for a 4 cm by 3 cm by 2 cm prism. Find its surface area. Choose a drawing scale.

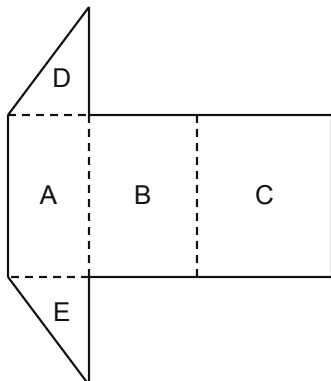


**ANSWER** \_\_\_\_\_

\_\_\_\_\_

## APPLY IT Show your work

- 1** A pencil case has the triangular-prism net shown. Explain which faces cover its ends and which cover its sides. Find the material needed to cover all outside faces; ignore seams.



A:  $6 \times 12$ ; B:  $8 \times 12$ ; C:  $10 \times 12$ ; D/E: right triangle: legs 6, 8; third side 10 (cm). Dashed edges fold.

### REASONING AND ANSWER

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- 2** A cube-shaped gift box has side length 3 cm. Draw a connected net of six squares that folds into the closed box. Label the side lengths and calculate the paper needed, ignoring tabs and overlap.



### REASONING AND ANSWER

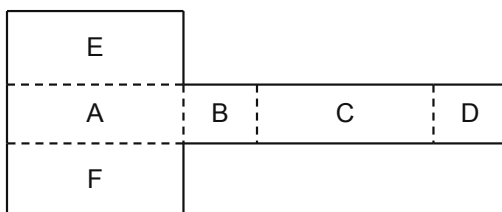
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**CHALLENGE** One step up

Mira adds the areas of A, B and E and reports  $128 \text{ cm}^2$  for this closed prism. Use the net to explain the error and give the correct surface area.

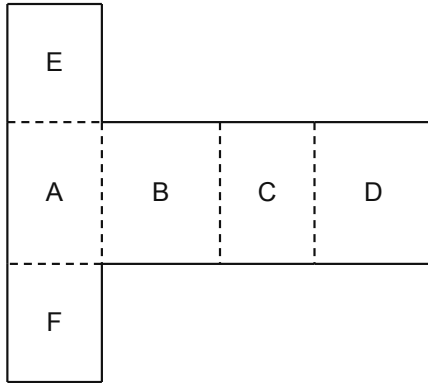


A/C:  $12 \times 4$ ; B/D:  $5 \times 4$ ; E/F:  $12 \times 5$  (cm). Dashed edges fold.

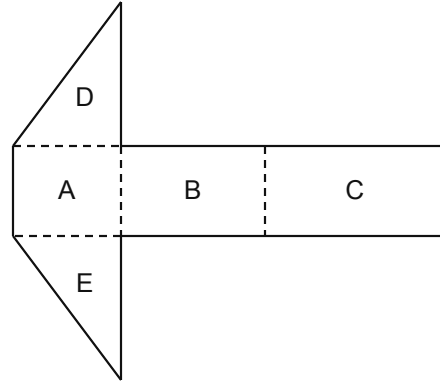
WORK SPACE AND ANSWER

**PRACTICE 1**

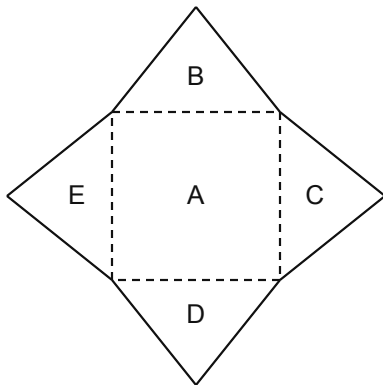
**A/C: 24 each; B/D: 30 each; E/F: 20 each.**  
**Total  $2(24 + 30 + 20) = 148 \text{ cm}^2$ .**

**PRACTICE 2**

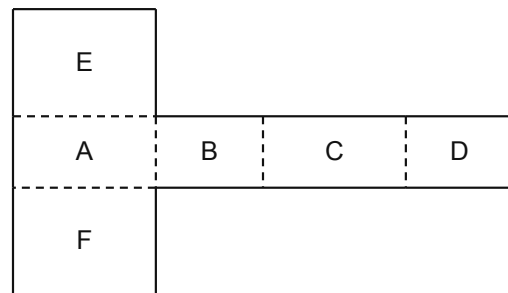
**D/E are right triangles, each area 24; A/B/C have areas 30, 40, 50. Total  $48 + 120 = 168 \text{ cm}^2$ .**

**PRACTICE 3**

**Square A: 64; triangles B-E: 20 each. Total  $64 + 80 = 144 \text{ cm}^2$ .**

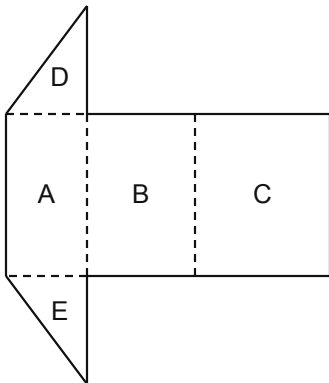
**PRACTICE 4**

**One valid six-face net is shown. Two  $4 \times 3$  faces, two  $4 \times 2$  faces and two  $3 \times 2$  faces give  $2(12 + 8 + 6) = 52 \text{ cm}^2$ .**



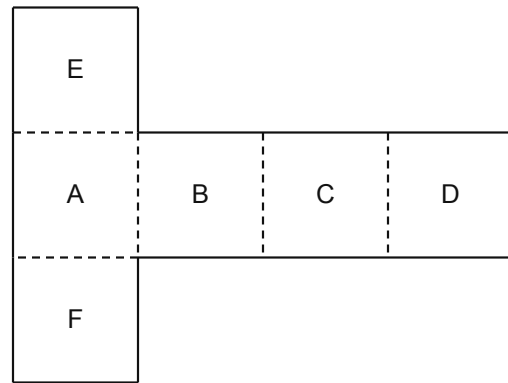
### APPLY IT 1

**336 cm<sup>2</sup>** D/E cover the ends:  $2(6 \times 8 \div 2) = 48$ .  
A/B/C wrap the sides:  $12(6 + 8 + 10) = 288$ . Total  
336 cm<sup>2</sup>.



### APPLY IT 2

**54 cm<sup>2</sup>** Each of six faces is  $3 \times 3 = 9$  cm<sup>2</sup>. One  
valid net is shown; rotated or different foldable  
nets are acceptable.



### CHALLENGE

**Mira counts only one face from each equal pair. C, D  
and F are missing:  $48 + 20 + 60 = 128$  more. The  
closed prism has six faces and surface area 256 cm<sup>2</sup>.**

Require actual labeled nets for Practice 4 and Apply 2; a  
face list or area calculation alone is incomplete. Accept  
any connected net that folds to the stated solid without  
overlap. Check six rectangles/squares for a rectangular  
prism/cube, two right triangles plus three rectangles for  
the triangular prism, and a square plus four triangles for  
the pyramid. Triangle side lengths and perpendicular  
heights are supplied; Pythagorean inference is not  
required. Diagrams omit gluing tabs.

