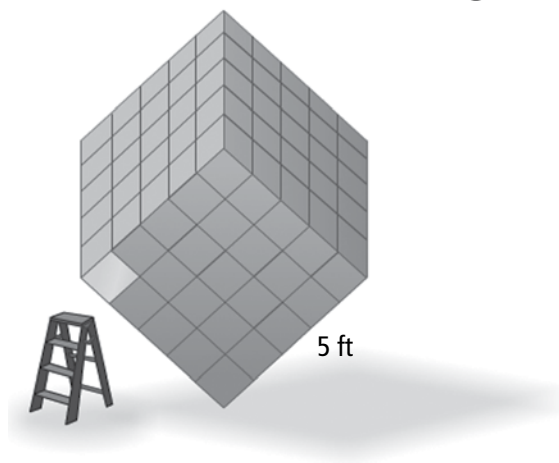# Surface Areas of Right Prisms

CCSS: 7.G.B.6: Solve real-world and mathematical problems involving area, volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.

Launch

SAMPLE SOLUTIONS ARE SHOWN BELOW.

MP4, MP7

One square foot of this cube-shaped sculpture takes you 10 minutes to polish. At this rate, how long will it take you to polish the whole thing? Justify your reasoning.

5 ft

Each face of the cube has an area of 5 ft · 5 ft = 25 ft².

A cube has 6 equal faces, so you need to multiply by 6 to count all the faces. 6 · 25 ft² = 150 ft².

If each square foot takes 10 minutes to polish, 150 ft² will take 150 · 10 or 1,500 minutes to polish.

1,500 minutes ÷ $\frac{60 \text{ minutes}}{\text{hour}}$ = 25 hours.

Reflect Why do you need only the length of one edge to solve the problem?

Sample: Because it is a cube, the lengths of each side of each face are equal. You can find the area of each face if you know the side length of one face.
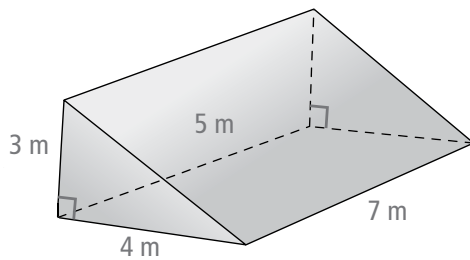
Got It?

PART 1 Got It mc

What is the surface area of a cube with edge length $\frac{3}{4}$ ft?

$3\frac{3}{8}$ ft^2

PART 2 Got It mc
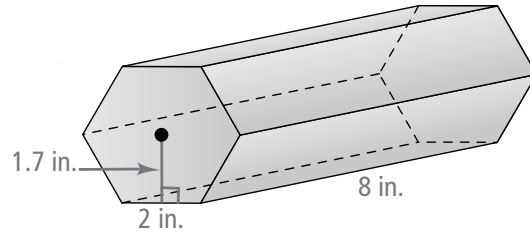
What is the surface area of the triangular prism?

3 m

5 m

7 m

4 m

96 m^2

Got It?

To the nearest square inch, what is the surface area of the regular hexagonal prism?

1.7 in.

2 in.

8 in.

116 in.²

Close and Check

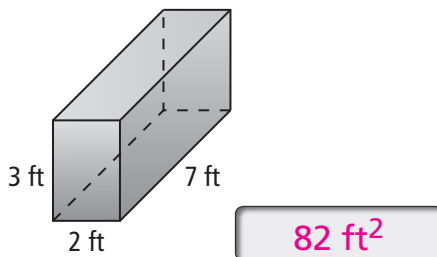> ## Focus Question
> **MP2, MP7**
>
> How can you apply what you know about finding the surface area of a right rectangular prism to finding the surface area of any right prism?
>
> The surface area of any right prism is the sum of the areas of the faces. You can apply the same formula, S.A. = ph + 2B, to find the surface area of any right prism, but the formula for finding the area of a base (B) will depend on its shape.
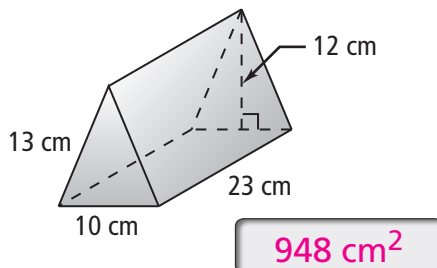
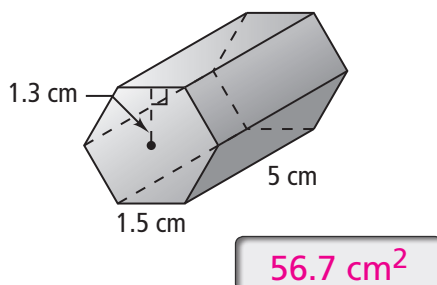## Do you know HOW?
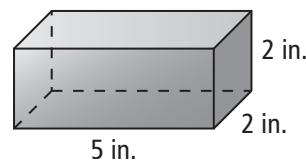
Find the surface area of each figure below.

1.

3 ft   7 ft

2 ft

82 ft^2

2.

12 cm

13 cm

23 cm

10 cm

948 cm^2

3.

1.3 cm

5 cm

1.5 cm

56.7 cm^2

Do you UNDERSTAND?

4. Error Analysis Explain the mistake made below. What is the correct surface area?

2 in.

2 in.

5 in.

> S.A. = (2 + 2 + 2 + 2)(5) + 4
>
> S.A. = (8)(5) + 4
>
> S.A. = 40 + 4
>
> S.A. = 44 in.^{2}

The solution does not include the area of both bases.

The surface area is 48 in.^{2}.

5. Writing If you turned the rectangular prism from Exercise 1, would the surface area change? Explain.

No, the surface area does not change because the dimensions are still the same.