

Guided Practice

At A Glance

Students find the surface area for a variety of right prisms.

Step By Step

- Ask students to solve the problems individually and show their work. Tell students they may want to sketch a diagram to help them with certain problems.
- **Pair/Share** When students have completed each problem, have them Pair/Share to discuss their solutions with a partner or in a group.

Solutions

Example Breaking apart the figure into four 2 by 8 rectangles and two 2 by 2 rectangles, finding their areas, and adding them is one way to solve the problem.

16 Solution 352 cm²; Break apart the cylinder into two circles and a rectangle.
DOK 1

Practice Finding Surface Area of Solids

Study the example below. Then solve problems 16–18.

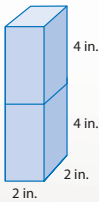
Example

Jing put two identical building blocks on top of each other. The dimensions of each block were 2 in. by 2 in. by 4 in. What is the surface area of the resulting prism?

Look at how you could show your work by drawing a model.

There are 4 faces that are 2 in. by 8 in. and 2 faces that are 2 in. by 2 in.

Surface Area = 4(2)(8) + 2(2)(2)
= 64 + 8



Solution 72 in.²

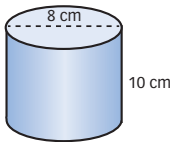


The student found the dimensions of the new figure and found its surface area.

Pair/Share

Why can't you find the surface area of each block and double it?

- 16** Find the surface area of the cylinder shown below. (Use 3.14 for π , and round your answer to the nearest whole unit.)



How many surfaces does this solid figure have?

Show your work.

Surface Area = area of 2 circular bases + area of rectangle

$2\pi(4)^2 + 2\pi(4)(10) = 32\pi + 80\pi = 112\pi$

$112\pi \approx 112(3.14) \approx 352$

Solution 352 cm²

Pair/Share

What information do you need to find the surface area of any cylinder?

278

Teacher Notes

Blank lined area for teacher notes.

- 17 How much wrapping paper would you need to cover a rectangular box that is 19 inches by 12 inches by 3 inches if you need 10% more wrapping paper than the surface area of the box? Give your answer to the nearest square inch.

Show your work.

Surface Area = $2(19)(12) + 2(3)(12) + 2(3)(19)$
 $= 456 + 72 + 114$
 $= 642 \text{ in.}^2$

10% more = $1.1(642)$
 $= 706.2$
 ≈ 706

Solution 706 in.²



Would drawing a model help?

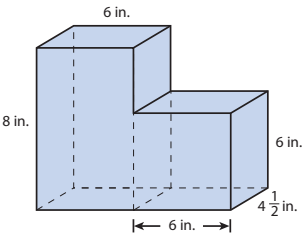


Pair/Share

How could you check to see if your answer is reasonable?

- 18 Find the surface area of the solid below. Circle the letter of the correct answer.

- A 348 in.²
B 375 in.²
C 378 in.²
D 402 in.²



What two solids make up this three-dimensional figure?

Alex chose B as the correct answer. What did she do wrong?

She included a face that is inside the figure, where the two prisms that make up the figure join together.



Pair/Share

Can you think about this as one solid figure?

Solutions

17 Solution

706 square inches; Break apart the box into two 19 by 12, two 3 by 12, and two 3 by 19 rectangles. Find the area of each and add them. Then multiply that area by 1.1.

DOK 2

18 Solution

A; Alex included the area of a face that is inside the figure.

Explain to students why the other two answer choices are not correct:

C is not correct because it represents the volume of the figure.

D is not correct because it is the sum of the surface areas of the two prisms that form the figure.

DOK 3



Ready Mathematics
PRACTICE AND PROBLEM SOLVING

Assign *Practice and Problem Solving* pages 301–302 after students have completed this section.

Teacher Notes

Independent Practice

At A Glance

Students solve word problems that might appear on a mathematics test. The problems test students' knowledge of surface area and how to find the surface area of a variety of right prisms and cylinders.

Solutions

- 1

Solution

B; Find the sum of the surface areas of the cubes, $6(9) + 6(4) = 78$, and subtract $2(2)(2)$ for the surface area where the cubes meet.

DOK 2
- 2

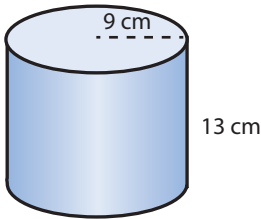
Solution

a. True; **b.** False; **c.** True; **d.** False

DOK 2

Quick Check and Remediation

- Ask students to find the surface area of the cylinder at the right. [$396\pi\text{ cm}^2$, or about $1,243\text{ cm}^2$]



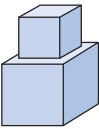
- For students who are struggling, use the chart to guide remediation.
- After providing remediation, check students' understanding. Ask students to find the surface area of a cylinder with diameter 4 cm and height 4 cm. [$24\pi\text{ cm}^2$, or about 75 cm^2]
- If a student is still having difficulty, use *Ready Instruction, Grade 6, Lesson 24.*

Practice Finding Surface Area of Solids

Solve the problems.

- 1

Two cubes with edge lengths of 3 centimeters and 2 centimeters are placed on top of each other as shown. What is the surface area of the resulting figure?



- A

65 cm²
- B

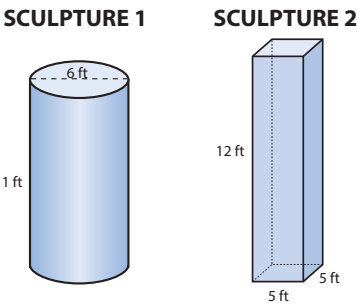
70 cm²
- C

74 cm²
- D

78 cm²

- 2

An artist is commissioned to build two hollow glass sculptures standing vertically, one in the form of a cylinder and one in the form of a rectangular prism. Their dimensions are shown below.



Choose *True* or *False* for each statement.

- a.

The volume of Sculpture 1 is greater than the volume of Sculpture 2.

☒

 True

☐

 False
- b.

The surface area of Sculpture 2 is less than the surface area of Sculpture 1.

☐

 True

☒

 False
- c.

The base of Sculpture 1 covers a larger area than the base of Sculpture 2.

☒

 True

☐

 False
- d.

Sculpture 1 requires more glass to complete than Sculpture 2.

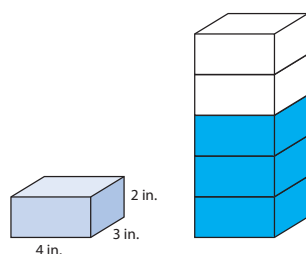
☐

 True

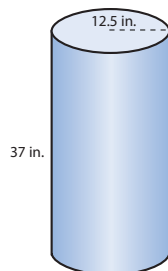
☒

 False

- 3 The prism below has dimensions 2 inches by 3 inches by 4 inches. To the right of the prism, shade the number of prisms necessary, if stacked on top of each other as shown, to create a new prism with a surface area between 100 square inches and 130 square inches.



- 4 Mario is decorating a rain barrel that is in the shape of a cylinder. He will paint the top and side of the barrel, but not the bottom. If a tube of paint covers 400 square inches, how many whole tubes of paint will Mario need to buy? (Use 3.14 for π .)



Show your work.

Possible student work:

$$\begin{aligned}\text{Surface Area} &= \pi(12.5)^2 + 2\pi(12.5)(37) \\ &\approx 156.25(3.14) + 925(3.14) \approx 3,395.125 \\ 3,395.125 \div 400 &\approx 8.488\end{aligned}$$

Answer Mario needs to buy 9 whole quarts of paint.

Self Check Go back and see what you can check off on the Self Check on page 201.

281

Solutions

3 Solution

Students shade 3 prisms; First, find the surface area of the prism not including one 3 in. by 4 in. face because you'll use that for both the bottom and top of the stack. Then, find the surface area of the prism not including either 3 in. by 4 in. face because you'll be using that for the middle sections of the stack. Determine what combination gives you a surface area between 100 and 130 square inches.

$$40 + 28 + 40 = 108$$

DOK 2

4 Solution

9 whole tubes of paint; Find the surface area minus the bottom of the barrel. See possible student work on Student Book page.

DOK 2

► Hands-On Activity

Make a rectangular prism sculpture and find its surface area.

Materials: assortment of small rectangular boxes, rulers

Give pairs or small groups of students a few of the boxes. Tell them they are to create a sculpture by stacking the boxes. Then they will find the surface area of their sculpture. Suggest they begin with the widest box as a base and stack as many others as they like on top of it and even on top of each other for a third layer. Once they are happy with the sculpture, have them measure to find the surface area of the sculpture.

► Challenge Activity

Solve a 3-D puzzle.

Tell students that three cubes with edge lengths 6 cm, 3 cm, and 1 cm each are stacked on top of each other with the largest on the bottom and smallest on top. Challenge students to find the surface area of the resulting figure. [256 cm²]