

LESSON 30: Surface Area

[OBJECTIVE]

The student will represent rectangular and triangular prisms using nets and use the nets to determine the surface area of those figures in mathematical and real-world problems.

[PREREQUISITE SKILLS]

area of rectangles and triangles

[MATERIALS]

Student pages **S370–S381**

Centimeter cubes (24 per student pair)

Copy Master T719

Foldable from Lesson 28

[ESSENTIAL QUESTIONS]

1. How is surface area different from area?
2. Why is surface area measured in square units?
3. Explain how to use the net of a prism to determine the surface area.

[WORDS FOR WORD WALL]

surface area, rectangular prism, cube, face, net, two-dimensional

[GROUPING]

Cooperative Pairs (CP), Whole Group (WG), Individual (I)

[LEVELS OF TEACHER SUPPORT]

Modeling (M), Guided Practice (GP), Independent Practice (IP)

[MULTIPLE REPRESENTATIONS]

SOLVE, Algebraic Formula, Verbal Description, Concrete Representation, Pictorial Representation, Graphic Organizer

[WARM-UP] (IP, I, WG) S370 (Answers on T714.)

Have students turn to S370 in their books to begin the Warm-Up. Students will find the areas of triangles and rectangles to prepare for finding the surface areas of rectangular prisms. Monitor students to see if any of them need help during the Warm-Up. Have students complete the problems and then review the answers as a class. {Algebraic Formula, Pictorial Representation}

[HOMEWORK]

Take time to go over the homework from the previous night.

[LESSON] [1-2 Days (1 day = 80 minutes) – M, GP, WG, CP, IP]

LESSON 30: Surface Area

SOLVE Problem

(GP, WG) S371 (Answers on T715.)

Have students turn to S371 in their books. The first problem is a SOLVE problem. You are only going to complete the S step with students at this point. Tell students that during the lesson they will learn how to find the surface area of rectangular prisms using nets. They will use this knowledge to complete this SOLVE problem at the end of the first part of the lesson. **{SOLVE, Graphic Organizer, Verbal Description}**

Discovery Activity – Surface Area of Rectangular Prisms

(M, GP, CP, IP, WG) S371, S372 (Answers on T715, T716.)

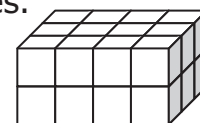
M, GP, WG, CP:

Pass out the centimeter cubes to each pair of students. Assign the role of Partner A and Partner B to students. Use the following activity to complete the steps on S371 with your students. **{Concrete Representation, Algebraic Formula, Verbal Description}**

MODELING

Discovery Activity - Surface Area of a Rectangular Prism

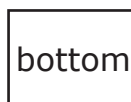
Step 1: Have students create a **rectangular prism** out of the centimeter cubes with a length of 4 cubes, a width of 3 cubes, and a height of 2 cubes.



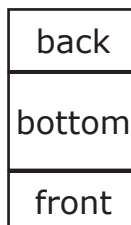
Step 2: Have student pairs discuss how many **faces** there are on the prism.

Step 3: Model for the students how to draw the base (bottom) rectangle on the graph paper on S372. Be sure to tell students that the length of one cube is the same as the length of one square on the graph paper.

- Draw the bottom so that it is 4 squares long and 3 squares wide. Label it "bottom."

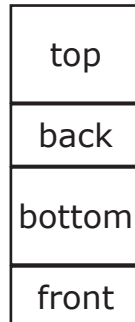


- Partner A, which faces would be touching the bottom face if you were able to unfold the prism? (front and back) or (right and left)
- Start by drawing the front and back so that they are connected to the bottom. Make the back and front both rectangles that are 4 squares long and 2 squares wide.

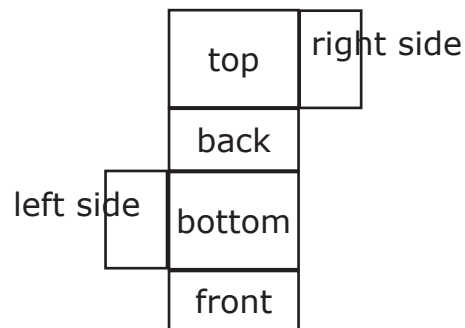


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- Partner B, where will the top connect to what you have already drawn? Model how to draw the top so that it connects to the back.
- Have students copy the net in their books.



- Partner A, where do you think the sides of the prism should be drawn?
- Model drawing the sides and label each face.



- Explain to students that what they have just drawn is a **net** of the prism.
- Have students discuss the meaning of a net. (a **two-dimensional** representation that can be folded to form a prism)

Step 4: Have student pairs discuss strategies to find the **surface area** of the prism.

- Partner A, what strategy could we use? (Find the area of each of the sides or faces.)
- Partner B, how can we find the area of the shape? [We can count the squares or we can use the area formula ($A = lw$) to find the area of each face.]
- Partner A, what is the area of the rectangle that represents the top? (12 square units) Record.
- Partner B, what is the area of the rectangle that represents the front? (8 square units) Record.
- Partner A, what is the area of the rectangle that represents the right side? (6 square units) Record.
- Partner B, what is the area of the rectangle that represents the bottom? (12 square units) Record.

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- Partner A, what is the area of the rectangle that represents the back? (8 square units) Record.
- Partner B, what is the area of the rectangle that represents the left side? (6 square units) Record.

Step 5: Partner A, what is the combined area of the faces of the rectangular prism? (52 square units) Record.

- Partner B, what do you notice about the areas of the different faces? (The top and bottom are the same, the front and back are the same, and the right and left are the same.) Record.
- Have student pairs discuss the meaning of the term surface area. (the total area of all the faces of a three-dimensional figure) Record.

Practice – Surface Area of Rectangular Prisms

(M, GP, WG, CP, IP) S373 (Answers on T717.)

M, GP, WG, CP:

Have students turn to S373 in their books. Use the following activity to help students complete the problems on S373 as you model drawing the nets and finding the surface areas of the rectangular prisms {**Pictorial Representation, Algebraic Formula, Verbal Description**}

MODELING**Practice - Surface Area of Rectangular Prisms**

Step 1: Have students look at Example 1 and determine the length, the width, and the height of the prism in units. Remind students that to find the surface area, they can draw a net.

- Partner A, what is the length of the prism? (5 units)
- Partner B, what is the width of the prism? (3 units)
- Partner A, what is the height of the prism? (4 units)

Step 2: In the middle column, draw and label a net. Label each face and explain how you are labeling the measurements. For example:

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“When I look at the top, I can see that the top is five cubes long by 3 cubes wide. So, when I draw the rectangle for the top, I am going to label it ‘5 units’ for the length and ‘3 units’ for the width. I know that the bottom will be the same, but they are not connected on the net, so I need to draw the front first. When I look at the front, it is also 5 cubes long by 4 cubes wide. When I draw them, I do not need to label every single side. I can tell what they are if they are lined up. Now I need to draw and label each side. When looking at them, I can see that the sides are 3 by 4 rectangles.”

Step 3: In the third column, model for students how to write the formula for the surface area of a rectangular prism: $SA = 2(\text{top area}) + 2(\text{front area}) + 2(\text{side area})$.

Step 4: Look at Example 2 with students.

- Partner A, what type of shape is modeled in Example 2? (**cube**) Explain your answer. (All the edge lengths are the same.)
- Have students create the net to model the cube.
- Partner B, explain the size of all the faces. (The faces are all the same because the figure is a cube.)

Step 5: Have students find the surface area for Example 2.

- Have students discuss another strategy for determining the area. (Since all the sides have exactly the same area, they can find the area of one face and then multiply it by 6.)

Step 6: Look at Example 3 with students. After reading the problem, have students draw a prism to match the dimensions. Explain that this will help them to be able to visualize and draw the net.

- Draw the net, again asking students which sides would be touching if the prism were unfolded.
- Have students find the surface area of the prism and review the answers as a whole group.

SOLVE Problem**(WG, GP) S374 (Answers on T718.)**

Have students turn to S374 in their books. Remind students that the SOLVE problem on S374 is the same one from the beginning of the lesson. Complete the SOLVE problem with your students. Ask them for possible connections from the SOLVE problem to the lesson. (Students will be finding the surface area of a rectangular prism.) **{SOLVE, Algebraic Formula, Verbal Description}**

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SOLVE Problem**(GP, WG) S375 (Answers on T720.)**

Have students turn to S375 in their books. This is a SOLVE problem for triangular prisms. You are only going to complete the S step with students at this point. Tell students that during the lesson they will learn how to find the surface area of triangular prisms using nets. They will use this knowledge to complete this SOLVE problem at the end of the lesson. **{SOLVE, Graphic Organizer, Verbal Description}**

Discovery Activity – Surface Area of Triangular Prisms (M, GP, CP, IP, WG)
S375, S376, S377, Copy Master T719 (Answers on T720, T721, T722.)

M, GP, WG, CP: Give each student pair a copy of Copy Master page T719. Be sure students know their designation as Partner A or Partner B. **{Concrete Representation, Pictorial Representation, Algebraic Formula, Verbal Description, Graphic Organizer}**

MODELING**Discovery Activity - Surface Area of Triangular Prisms**

Step 1: Have student pairs discuss Figure 1 on T719 and compare it to the rectangular prism on S372.

- Have students share their responses. (made up of 5 total shapes, two of those shapes are triangles, bases are triangles, 3 faces are rectangles) Record.
- Model for students how to cut out Figure 1 around the outside and then tape the sides to create a geometric figure so that the centimeter grids are facing out.

Step 2: Partner A, what figure have you created? Explain your answer. (A triangular prism. The bases are congruent triangles and there are three rectangular faces.) Record.

- Have student pairs discuss strategies for finding the surface area of the figure.
- Partner B, what are some ways you could find the surface area? (Find the area of each face and then add to find the total surface area, or count the total squares that make up the surface of the shape.) Record.

Step 3: Partner A, what is the area of Rectangle 1? (30 square units) Record.

- Partner B, what do you notice about Rectangles 2 and 3. (They are congruent because they have the same shape and size.) Record.
- Partner A, what is the area of Rectangle 2? (25 square units) Record. Rectangle 3? (25 square units) Record.
- Have students discuss the challenge of determining the area of Triangles 4 and 5. (It is difficult to count the squares because there are partial squares.) Record.

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Step 4: Partner B, what strategy could you use to find the area of each triangle? How would this help you? (Use the formula for the area of a triangle. The triangles are congruent so you can add the area of the two together.) Record.

- Partner A, what is the area of each triangle? (12 square units) Record.
- Partner B, what is the area of the two triangles? (24 square units) Record.
- What is the total surface area of the triangular prism? Explain your answer. ($30 + 25 + 25 + 24 = 104$ square units. I added the area of each face to find the total surface area.)

Step 5: Have students turn to page S376. Follow Steps 1 – 4 to create Figure 2, (Triangular Prism), from T719 and answer the questions. Have students discuss and answer the Challenge Question on the bottom of page S376.

CP, IP, WG:

Have students complete the problems in the chart on S377 to determine the surface area of the triangular prisms. Review the answers as a whole group. **{Pictorial Representation, Algebraic Formula, Verbal Description, Graphic Organizer}**

SOLVE Problem**(WG, GP) S378 (Answers on T723.)**

Have students turn to S378 in their books. Remind students that the SOLVE problem on S378 is the same one from the beginning of the section on triangular prisms. Complete the SOLVE problem with your students. Ask them for possible connections from the SOLVE problem to the lesson. (Students will be finding the surface area of a triangular prism.) **{SOLVE, Algebraic Formula, Verbal Description}**

Foldable**(M, GP)**

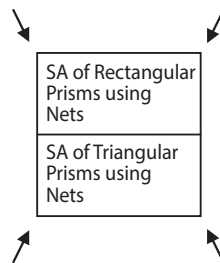
Have students use the foldable they created in Lesson 28 to add the information on surface area of rectangular and triangular prisms. **{Algebraic Formula, Graphic Organizer}**

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MODELING

Foldable

Step 1: Open the square. Fold each corner into the center. Write Surface Area of Rectangular Prisms Using Nets on the top half of the bottom of the organizer.



Step 2: Write Surface Area of Triangular Prisms Using Nets on the bottom half of the bottom of the organizer.

Step 3: Use the teacher sample for an example.

If time permits...**(CP, IP) S379 (Answers on T724.)**

Have students complete the five surface area problems on S379.

[CLOSURE]

To wrap up the lesson, go back to the essential questions and discuss them with students.

- How is surface area different from area? (*Area is the amount of space that is covered by either a two-dimensional figure, or the base of a three-dimensional figure. The surface area is the area of all of the faces of a three-dimensional figure added together.*)
- Why is surface area measured in square units? (*Because area is measured in square units, and you add the area of all the faces of the figure.*)
- Explain how to use the net of a prism to determine the surface area. (*Create a net of the prism that models each of the faces. Find the area of each of the faces and add them together to determine the total surface area.*)

[HOMEWORK] Assign S380 and S381 for homework. (Answers on T725 and T726.)

[QUIZ ANSWERS] T727–T728

1. C 2. D 3. B 4. C 5. A 6. C 7. D 8. B 9. B 10. C

The quiz can be used at any time as extra homework or to see how students progress on using the nets of rectangular and triangular prisms to determine the surface area in mathematical and real-world situations.

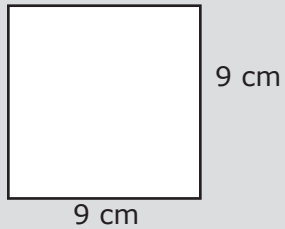
LESSON 30: Surface Area

Here is the key to **S370**.

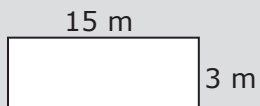
Warm-Up

Directions: Find the area of each shape.

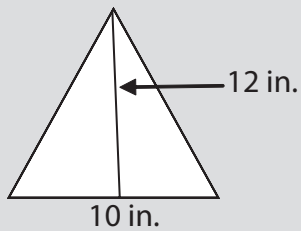
1.

**81 cm²**

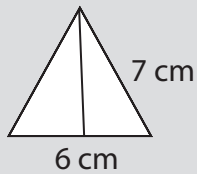
2.

**45 m²**

3.

**60 in.²**

4.

**21 cm²**

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Here is the key to **S371**.

Directions: Complete the following SOLVE problem with your teacher. You will only complete the S step.

Jack is covering a box with brown paper to mail to his grandmother. He is sending her a picture frame with his school picture in it. The box is 10 inches wide, 12 inches long, and 2 inches tall. What is the least amount of brown paper he will need to cover the box?

S Underline the question.

This problem is asking me to find **the amount of paper that would cover the box**.

Directions: Complete this page with your teacher and partner.

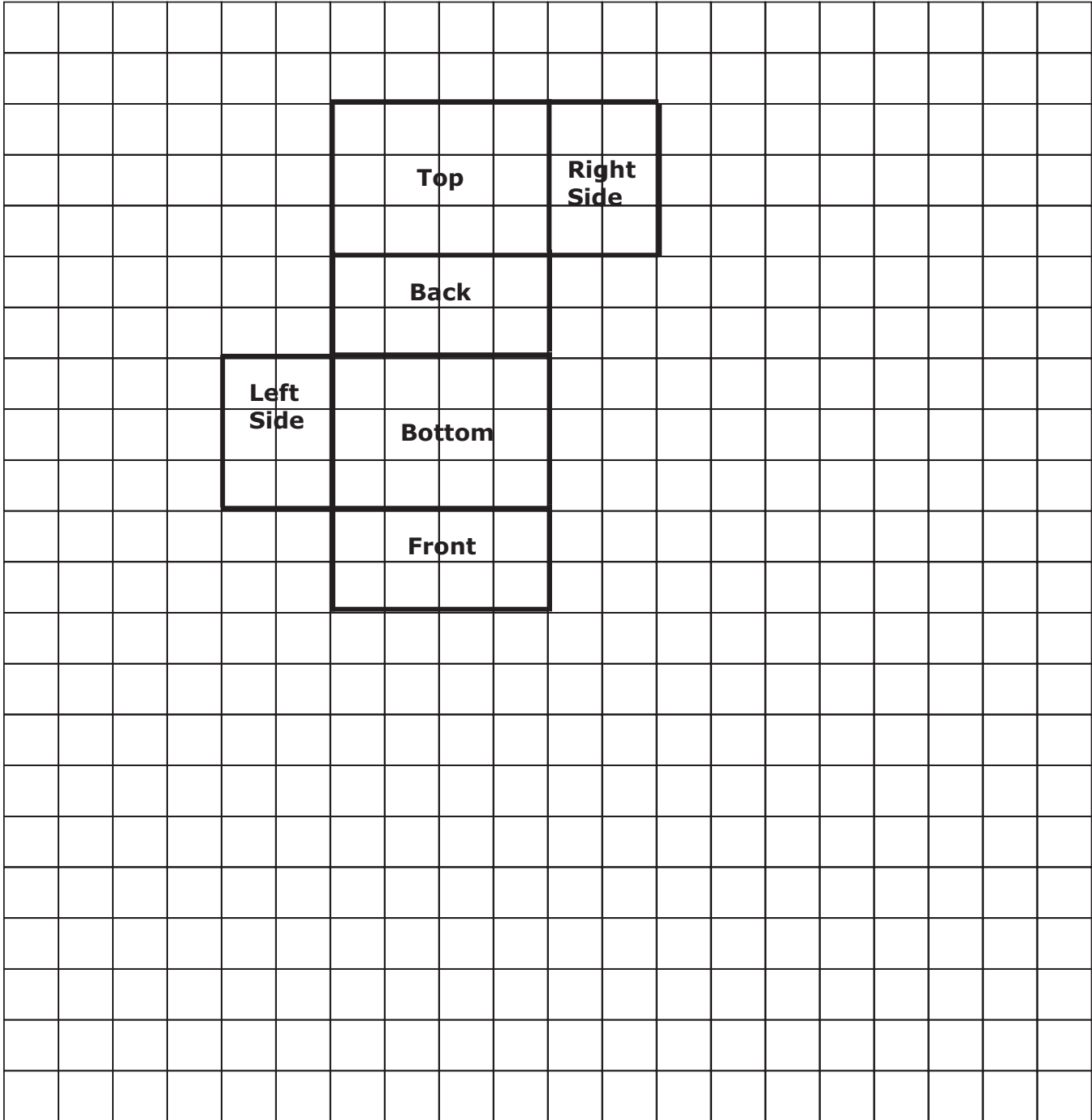
1. Use cubes to create a rectangular prism whose base is a 4 by 3 rectangle. Make your prism 2 layers tall.
2. How many faces does your prism have? **six**
3. Draw and label the bottom face (base) of your prism on the graph paper on S372. With your teacher, draw each of the other faces as if you were unfolding the prism. Label each face. What you have just drawn is called a net.
4. Find the area of each of the rectangles you drew.

Top: **12 square units** Front: **8 square units** Right Side: **6 square units**
Bottom: **12 square units** Back: **8 square units** Left Side: **6 square units**
5. What is the combined area of the faces of the rectangular prism? **52 square units**
6. What do you notice about the areas of the different faces? **The top and bottom are the same, the front and back are the same, and the right and left are the same.**
7. Write a definition for Surface Area: **the total area of all the faces of a three-dimensional figure**

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Here is the key to **S372**.

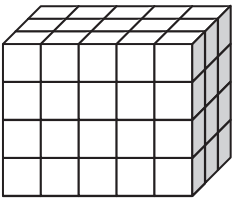
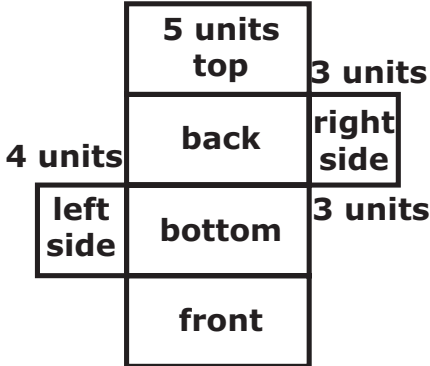
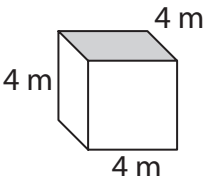
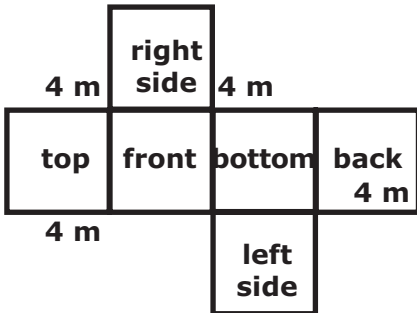
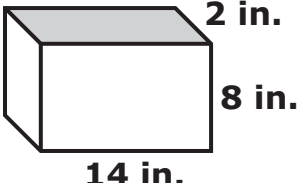
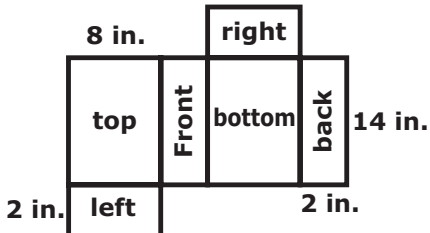
Directions: Complete this page with your teacher and partner.



LESSON 30: Surface Area

Here is the key to **S373**.

Directions: Complete this page with your teacher and partner.

Prism	Net	Surface Area
<p>Example 1:</p> 		$SA = 2(\text{top area}) + 2(\text{front area}) + 2(\text{side area}) =$ $= 2(5)(3) + 2(5)(4) + 2(3)(4)$ $= 2(15) + 2(20) + 2(12)$ $= 30 + 40 + 24$ $= 94 \text{ square units}$
<p>Example 2:</p> 		$SA = 2(\text{top area}) + 2(\text{front area}) + 2(\text{side area}) =$ $= 2(4)(4) + 2(4)(4) + 2(4)(4)$ $= 2(16) + 2(16) + 2(16)$ $= 32 + 32 + 32 = 96 \text{ m}^2$ <p style="text-align: center;">or</p> $6(4)(4) = 6(16) = 96 \text{ m}^2$
<p>Example 3: Tamara wants to cover her sofa cushions with new material. The cushions are 14 inches by 8 inches by 2 inches. How much material is needed to cover one cushion?</p> 		$SA = 2(\text{top area}) + 2(\text{front area}) + 2(\text{side area}) =$ $= 2(14)(8) + 2(14)(2) + 2(8)(2)$ $= 2(112) + 2(28) + 2(16)$ $= 224 + 56 + 32$ $= 312 \text{ in.}^2$

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Here is the key to **S374**.

Directions: Complete the following SOLVE problem with your teacher.

Jack is covering a box with brown paper to mail to his grandmother. | ~~He is sending her a picture frame with his school picture in it.~~ | The box is 10 inches wide, | 12 inches long, | and 2 inches tall. | What is the least amount of brown paper he will need to cover the box?

S Underline the question.

This problem is asking me to find **the amount of paper that would cover the box.**

O Identify the facts.

Eliminate the unnecessary facts.

List the necessary facts. **The box is 10 inches wide, 12 inches long, and 2 inches tall.**

L Write in words what your plan of action will be. **Use the formula $SA = 2(lw) + 2(lh) + 2(wh)$.**

Choose an operation or operations. **Multiplication, addition**

V Estimate your answer. **About 280 in.²**

Carry out your plan. **$SA = 2(lw) + 2(lh) + 2(wh)$**

$$SA = 2(12)(10) + 2(12)(2) + 2(10)(2)$$

$$SA = 2(120) + 2(24) + 2(20)$$

$$SA = 240 + 48 + 40 = 328 \text{ in.}^2$$

E Does your answer make sense? (Compare your answer to the question.) **Yes, because I found the surface area of the box.**

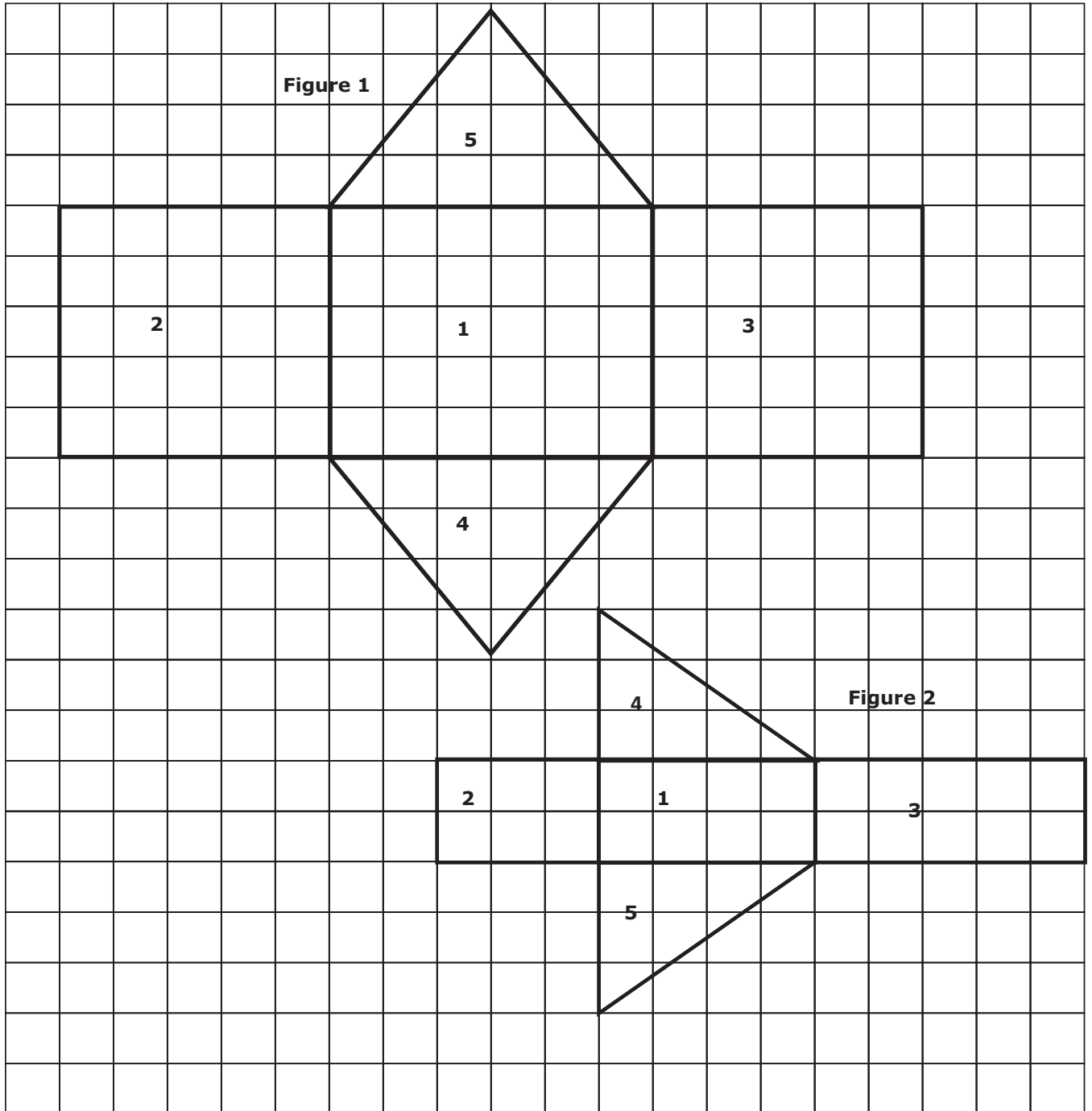
Is your answer reasonable? (Compare your answer to the estimate.) **Yes, because 328 is close to my estimate of about 280 square inches.**

Is your answer accurate? (Check your work.) **Yes**

Write your answer in a complete sentence. **He will need at least 328 square inches of brown paper to wrap the box.**

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Copy Master



LESSON 30: Surface Area

Here is the key to **S375**.

Directions: Complete the following SOLVE problem with your teacher. You will only complete the S step.

Tina is working on her geometry project. One of the three-dimensional figures she is working with is a triangular prism. The bases of the triangular prism are right triangles that have a base of 5 inches, a perpendicular height of 12 inches, and a hypotenuse of 13 inches. The prism has a height of 8 inches. What is the surface area of the triangular prism?

S Underline the question.

This problem is asking me to find **the surface area of the triangular prism.**

Directions: Complete this page with your teacher and partner.

<p>1. Look at Figure 1 on Copy Master page T719. Discuss with your partner how this shape is different from the rectangular prism on S372.</p>	<ul style="list-style-type: none"> • made up of 5 total shapes • 2 of those shapes are triangles • base is a triangle • 3 faces are rectangles
<p>Have students cut out Figure 1 and tape the sides to create the geometric figure so that the squares are facing out.</p>	
<p>2. What figure have you created? Explain your answer.</p>	<p>A triangular prism. The bases are congruent triangles and there are three rectangular faces.</p>
<p>3. Discuss with your partner strategies for finding the surface area of the figure.</p>	<ul style="list-style-type: none"> • Finding the area of each face • Counting the total squares that make up the surface of the shape
<p>4. What is the area of Rectangle 1?</p>	<p>30 square units</p>
<p>5. What do you notice about Rectangle 2 and 3?</p>	<p>They are congruent which means they have the same area.</p>
<p>6. What is the area of Rectangle 2? What is the area of Rectangle 3?</p>	<p>25 square units 25 square units</p>
<p>7. Discuss the challenge of determining the area of Triangle 4 and 5 with your partner.</p>	<p>It is difficult to count the number of squares because there are partial squares.</p>
<p>8. What strategy could you use to find the area of each triangle? How would this help you?</p>	<p>Use the formula for area of a triangle: $A = \frac{1}{2}bh$ The triangles are congruent so you can add the area of the two together.</p>
<p>9. Determine the area of each triangle and add the two areas together.</p>	<p>$A = \frac{1}{2}(6)(4) + \frac{1}{2}(6)(4) = 12 + 12 = 24$ square units</p>
<p>10. What is the total surface area of the triangular prism? Explain your answer.</p>	<p>$30 + 25 + 25 + 24 = 104$ square units. I added the area of each face to find the total surface area.</p>

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Here is the key to **S376**.

Directions: Complete this page with your teacher and partner.

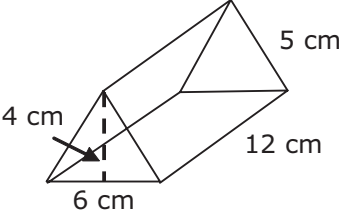
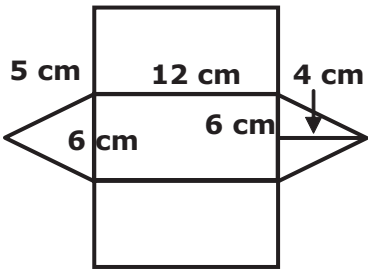
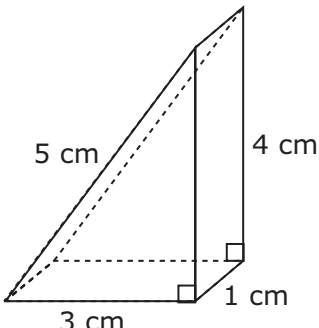
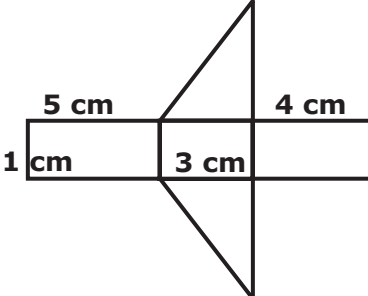
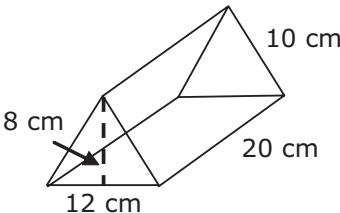
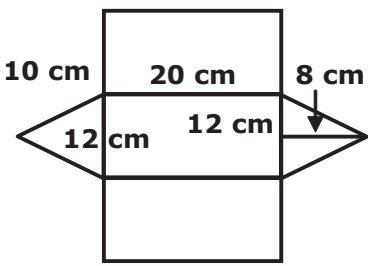
<p>1. Look at Figure 2 on Copy Master page T719. Discuss with your partner how this shape is different from the rectangular prism on S372.</p>	<ul style="list-style-type: none"> • made up of 5 total shapes • 2 of those shapes are triangles • base is a triangle • 3 faces are rectangles
<p>Have students cut out Figure 2 and tape the sides to create the geometric figure so that the squares are facing out.</p>	
<p>2. What figure have you created? Explain your answer. How is this shape different from the first?</p>	<p>A triangular prism. The bases are congruent triangles and there are three rectangular faces. All three rectangular faces are different sizes.</p>
<p>3. Discuss with your partner strategies for finding the surface area of the figure.</p>	<ul style="list-style-type: none"> • Finding the area of each face • Counting the total squares that make up the surface of the shape
<p>4. What is the area of Rectangle 1?</p>	<p>8 square units</p>
<p>5. What do you notice about Rectangles 2 and 3?</p>	<p>They are not congruent.</p>
<p>6. What is the area of Rectangle 2? What is the area of Rectangle 3?</p>	<p>Rectangle 2: 6 square units Rectangle 3: 10 square units</p>
<p>7. Discuss the challenge of determining the area of Triangles 4 and 5 with your partner.</p>	<p>It is difficult to count the number of squares because there are partial squares.</p>
<p>8. What strategy could you use to find the area of each triangle? How would this help you?</p>	<p>Use the formula for area of a triangle: $A = \frac{1}{2}bh$ The triangles are congruent so you can add the two areas together.</p>
<p>9. Determine the area of each triangle and add the two areas together.</p>	<p>$A = \frac{1}{2}(4)(3) + \frac{1}{2}(4)(3) = 6 + 6 = 12$ square units</p>
<p>10. What is the total surface area of the triangular prism? Explain your answer.</p>	<p>$8 + 6 + 10 + 12 = 36$ square units. I added the area of each face to find the total surface area.</p>

Challenge: Work with your partner and analyze the two figures. Determine why one figure has two faces that are congruent and one figure has three different-sized faces.

The triangle base of Figure 2 is a right triangle so the edges are three different lengths. This mean that the faces will be three different sizes.

LESSON 30: Surface Area

Here is the key to **S377**.**Directions:** Complete this page with your partner.

Prism	Net	Surface Area
<p>Example 1:</p> 		$ \begin{aligned} SA &= 2(\text{triangle area}) + 2(\text{side area}) + \text{base area} \\ &= 2 \left[\frac{1}{2}(6)(4) \right] + 2(5)(12) + (12)(6) \\ &= 2(12) + 2(60) + 72 \\ &= 24 + 120 + 72 \\ &= 216 \text{ square units} \end{aligned} $
<p>Example 2:</p> 		$ \begin{aligned} SA &= 2(\text{triangle area}) + 3 \text{ side areas} \\ &= 2 \left[\frac{1}{2}(3)(4) \right] + 4(1) + (3)(1) + 5(1) \\ &= 12 + 4 + 3 + 5 \\ &= 12 + 12 \\ &= 24 \text{ square cm} \end{aligned} $
<p>Example 3:</p> 		$ \begin{aligned} SA &= 2(\text{triangle area}) + 2(\text{side area}) + \text{base area} \\ &= 2 \left[\frac{1}{2}(12)(8) \right] + 2(10)(20) + (12)(20) \\ &= 2(48) + 2(200) + 240 \\ &= 96 + 400 + 240 \\ &= 736 \text{ square cm} \end{aligned} $

LESSON 30: Surface Area

Here is the key to **S378**.

Directions: Complete the following SOLVE problem with your teacher.

~~Tina is working on her geometry project.~~ | One of the three-dimensional figures she is working with is a triangular prism. | The bases of the triangular prism are right triangles that have a base of 5 inches, | a perpendicular height of 12 inches, | and a hypotenuse of 13 inches. | The prism has a height of 8 inches. | What is the surface area of the triangular prism?

S Underline the question.

This problem is asking me to find **the surface area of the triangular prism**.

O Identify the facts.

Eliminate the unnecessary facts.

List the necessary facts. **Triangular bases – right triangle with a base of 9 inches, perpendicular height of 12 inches and a hypotenuse of 13 inches. Prism height is 8 inches.**

L Write in words what your plan of action will be. **Find the area of both bases and the area of the 3 faces and add them together.**

Choose an operation or operations. **Multiplication, addition**

V Estimate your answer. **About 280 square inches**

Carry out your plan.

$$SA = 2\left(\frac{1}{2}bh\right) + lw + lw + lw$$

$$SA = 2\left(\frac{1}{2}\right)(5)(12) + 8(5) + 8(12) + 8(13)$$

$$SA = 60 + 40 + 96 + 104$$

$$SA = 300 \text{ in.}^2$$

E Does your answer make sense? (Compare your answer to the question.) **Yes, because I found the surface area of the prism.**

Is your answer reasonable? (Compare your answer to the estimate.) **Yes, because 300 is close to my estimate of about 280 square inches.**

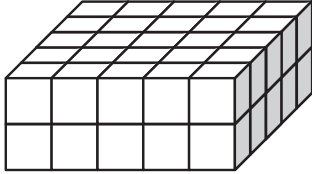
Is your answer accurate? (Check your work.) **Yes**

Write your answer in a complete sentence. **The surface area of the triangular prism is 300 square inches.**

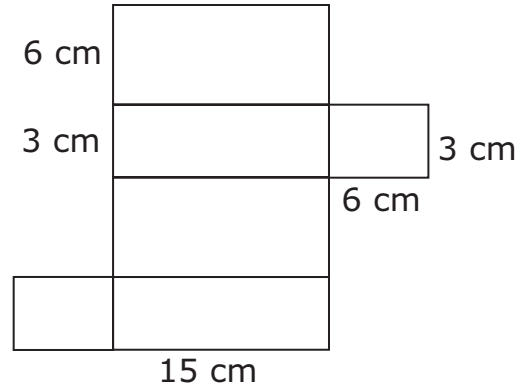
LESSON 30: Surface Area

Here is the key to **S379**.**Directions:** Find the surface area of the following rectangular prisms.

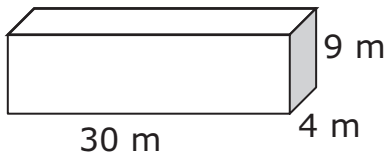
1.

**90 square units**

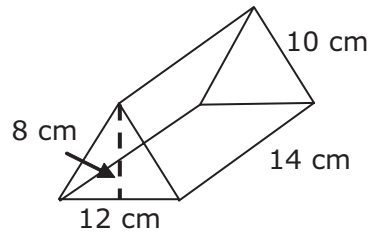
2.

**306 cm²**

3.

**852 m²**

4.

**544 cm²**

5. A plastic shoebox has dimensions of 15 inches, 6 inches, and 5 inches. How much plastic was used to make the box?

390 in.²

LESSON 30: Surface Area

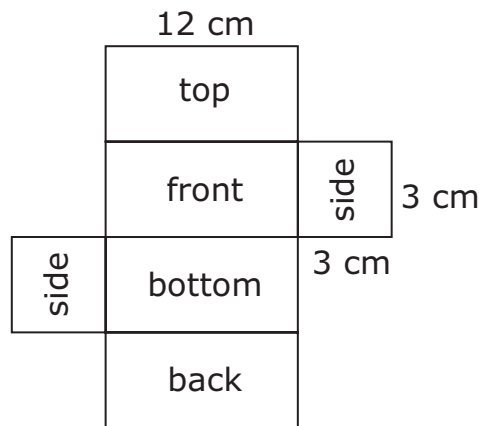
Here is the key to **S380**.

Homework

Name _____ Date _____

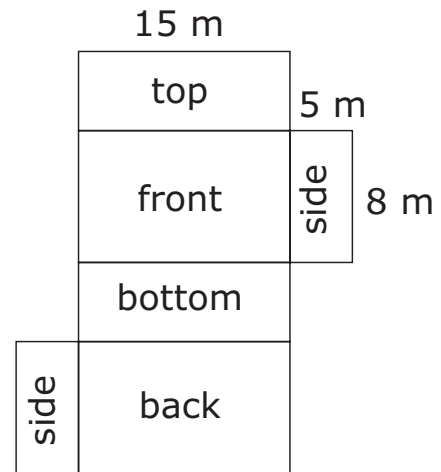
Directions: Find the surface area of each prism.

1.



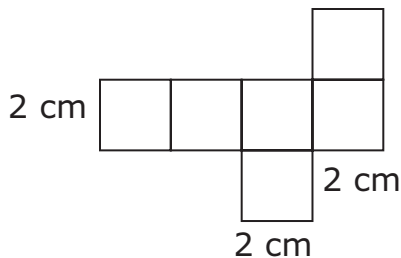
Area of top 36 m^2 (2) = 72 m^2
 Area of front: 36 m^2 (2) = 72 m^2
 Area of side: 9 m^2 (2) = 18 m^2
 Total area: 162 m^2

2.



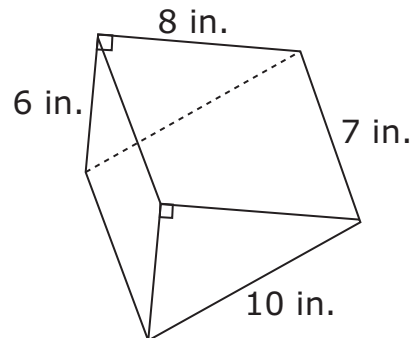
Area of top: 75 m^2 (2) = 150 m^2
 Area of front: 120 m^2 (2) = 240 m^2
 Area of side: 40 m^2 (2) = 80 m^2
 Total area: 470 m^2

3.



24 cm^2

4.



216 in.^2

LESSON 30: Surface Area

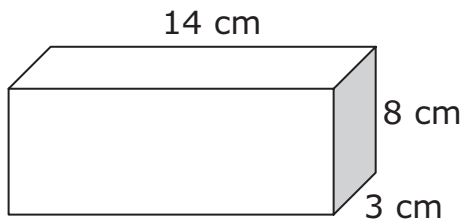
Here is the key to **S381**.

Homework

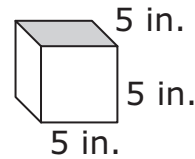
Name _____ Date _____

Directions: Find the surface area of each prism.

5.

**356 cm²**

6.

**150 in.²**

7. A rectangular prism has a length of 8 m, a width of 2 m, and a height of 3 m. What is the surface area of the prism?

92 m²

8. What is the surface area of a rectangular prism with a length of 5 cm, a width of 4 cm, and a height of 7 cm?

166 cm²

9. Fauna is painting a rectangular prism for a project. The length of the prism is 3 inches, the width is 8 inches, and the height is 5 inches. How many square inches will she be painting?

158 in.²

10. Tyleek has a box that he is covering with construction paper. The box is in the shape of a cube. The squares that make up the cube have a side length of 10 inches. What is the surface area of the cube?

600 in.²

LESSON 30: Surface Area

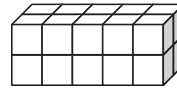
Name _____

Date _____

Quiz

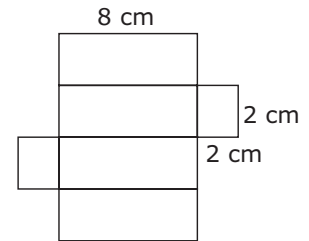
1. What is the surface area of the prism?

- A. 20 square units
- B. 24 square units
- C. 48 square units
- D. 60 square units



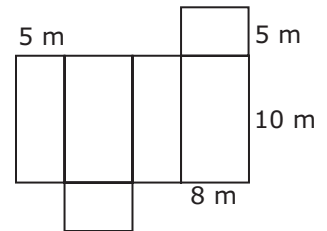
2. What is the surface area of the prism that matches the net drawn?

- A. 24 cm^2
- B. 32 cm^2
- C. 68 cm^2
- D. 72 cm^2



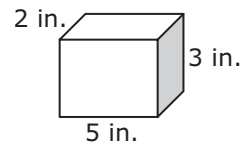
3. Find the surface area of a prism that is represented by the net shown.

- A. 400 m^2
- B. 340 m^2
- C. 170 m^2
- D. 85 m^2



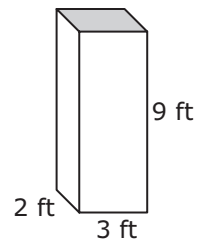
4. What is the surface area of the prism shown?

- A. 31 in.^2
- B. 44 in.^2
- C. 62 in.^2
- D. 93 in.^2



5. What is the surface area of the following prism?

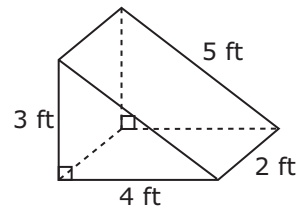
- A. 102 ft^2
- B. 76 ft^2
- C. 54 ft^2
- D. 51 ft^2



LESSON 30: Surface Area

6. What is the surface area of the figure?

- A. 12 ft^2
- B. 18 ft^2
- C. 36 ft^2
- D. 72 ft^2



7. A cardboard box has a length of 4 feet, a width of 3 feet, and a height of 1 foot. What is the surface area of the box?

- A. 12 ft^2
- B. 16 ft^2
- C. 19 ft^2
- D. 38 ft^2

8. A wooden chest measures 2 feet in length, 4 feet in width, and 5 feet tall. How much wood was used to make the chest?

- A. 80 ft^2
- B. 76 ft^2
- C. 40 ft^2
- D. 38 ft^2

9. Bailey is painting a rectangular prism green to use as a bush in the school play. The prism has a length of 15 inches, a width of 8 inches, and a height of 9 inches. How many square inches will she have to paint?

- A. 327 in.^2
- B. 654 in.^2
- C. $1,080 \text{ in.}^2$
- D. $2,160 \text{ in.}^2$

10. What is the surface area of the figure?

- A. 28 cm^2
- B. 36 cm^2
- C. 108 cm^2
- D. 118 cm^2

