

# 15

## Find Perimeter and Area

- Imagine you build a tree house. Where would you build it? When would you go to your tree house?
- How can you use math to determine the amount of wood needed to build a tree house? Why is it important to have precise measurements?

### Chapter Learning Target:

Understand perimeter and area.

### Chapter Success Criteria:

- I can identify the perimeter of a shape.
- I can describe the area of a shape.
- I can compare the area and perimeter of a shape.
- I can find the area and perimeter of a shape.



# 15

Name \_\_\_\_\_

## Vocabulary

### Review Words

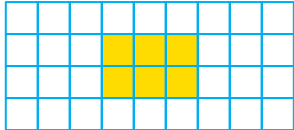
area

square unit

### Organize It

Use the review words to complete the graphic organizer.

The amount of surface a shape covers

  $\blacksquare = 1$

### Define It

What am I?

The distance around a figure

$4 \times 2 = M$

$2 \times 2 = R$

$6 \times 2 = E$

$3 \times 2 = I$

$8 \times 2 = T$

$5 \times 2 = P$

|    |    |   |   |   |    |    |    |   |
|----|----|---|---|---|----|----|----|---|
| 10 | 12 | 4 | 6 | 8 | 12 | 16 | 12 | 4 |
|----|----|---|---|---|----|----|----|---|

# Chapter 15 Vocabulary Cards

perimeter

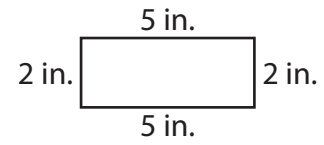
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The distance around a figure



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The perimeter of the rectangle is 14 inches.

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**Learning Target:** Find perimeters of figures.

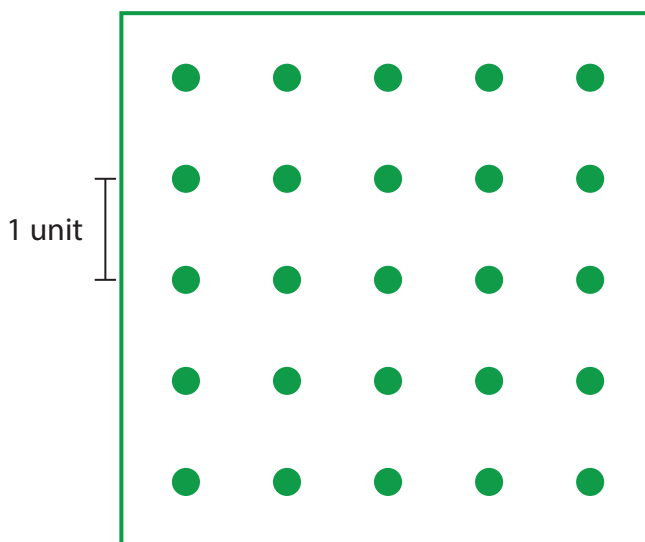
**Success Criteria:**

- I can count the number of units around a figure.
- I can tell the perimeter of a figure using standard units.
- I can use a ruler to find the perimeter of a figure.



## Explore and Grow

Model a rectangle on your geoboard. Draw the rectangle and label its side lengths. What is the distance around the rectangle?



\_\_\_\_\_ units



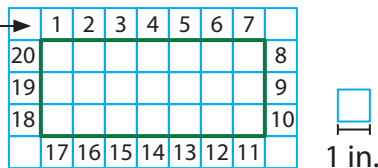
**Structure** Change the side lengths of the rectangle on your geoboard. What do you notice about the distance around your rectangle compared to the distance around the rectangle above? Explain.

# Think and Grow: Understand Perimeter

**Perimeter** is the distance around a figure. You can measure perimeter using standard units, such as inches, feet, centimeters, and meters.

**Example** Find the perimeter of the rectangle.

Choose a unit to begin counting. Count each unit around the rectangle.



Label the perimeter with units, not square units.



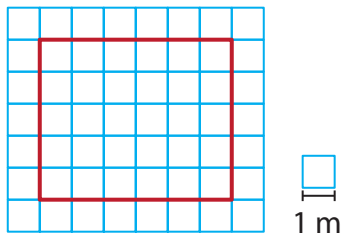
Each unit is \_\_\_\_\_ . There are \_\_\_\_\_ units around the figure.

So, the perimeter is \_\_\_\_\_ inches.

## Show and Grow

Find the perimeter of the figure.

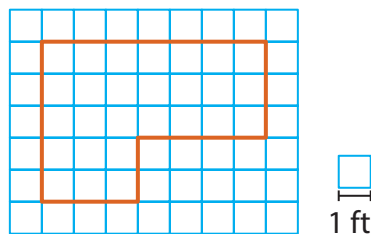
1.



There are \_\_\_\_\_ units around the figure.

So, the perimeter is \_\_\_\_\_ meters.

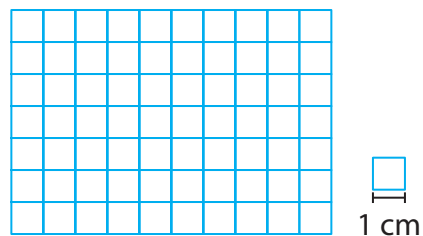
2.



There are \_\_\_\_\_ units around the figure.

So, the perimeter is \_\_\_\_\_ feet.

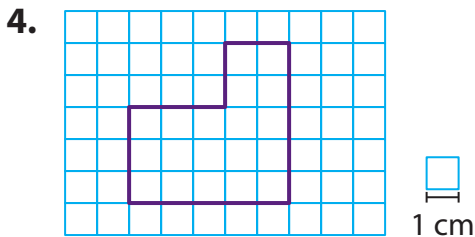
3. Draw a figure that has a perimeter of 16 centimeters.





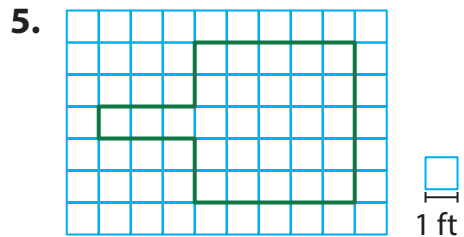
# Apply and Grow: Practice

Find the perimeter of the figure.



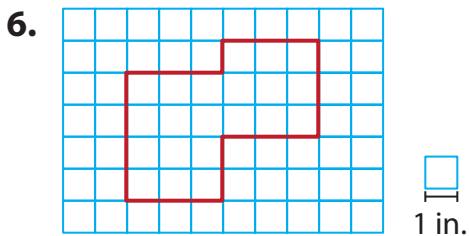
There are \_\_\_\_\_ units around the figure.

So, the perimeter is \_\_\_\_\_.

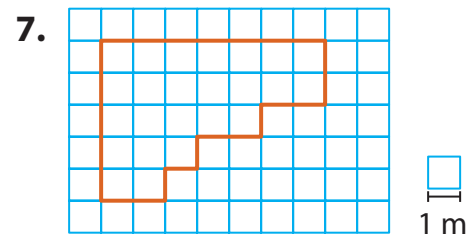


There are \_\_\_\_\_ units around the figure.

So, the perimeter is \_\_\_\_\_.

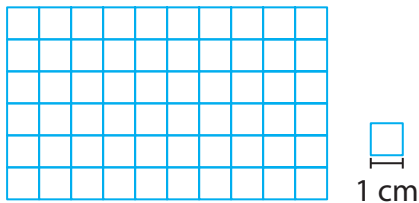


Perimeter = \_\_\_\_\_



Perimeter = \_\_\_\_\_

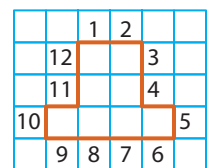
8. Draw a figure that has a perimeter of 14 centimeters.



9. **MP Precision** Which is the most likely measurement for the perimeter of a photo?

- 20 inches                      100 meters
- 5 centimeters                2 inches

10. **YOU BE THE TEACHER** Your friend counts the units around the figure and says the perimeter is 12 units. Is your friend correct? Explain.





## Think and Grow: Modeling Real Life

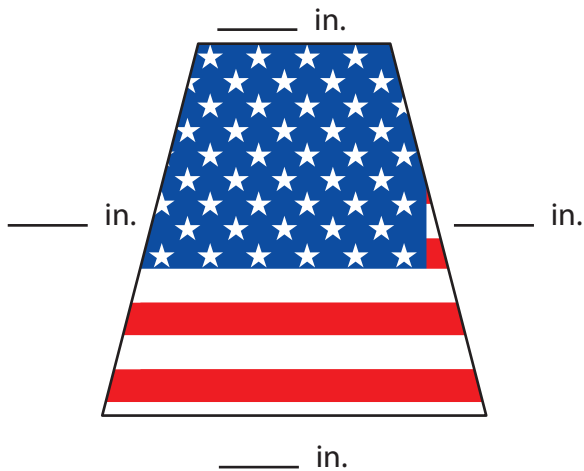
Use a centimeter ruler to find the perimeter of the bookmark.



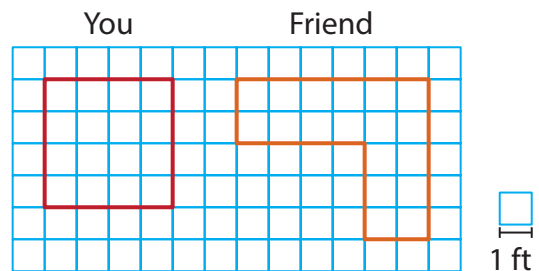
The perimeter is \_\_\_\_\_.

## Show and Grow

11. Use an inch ruler to find the perimeter of the decal.



12. How much greater is the perimeter of your friend's desk than the perimeter of your desk?



13. **DIG DEEPER!** Explain how you might use a centimeter ruler and string to estimate the perimeter of the photo of the window.

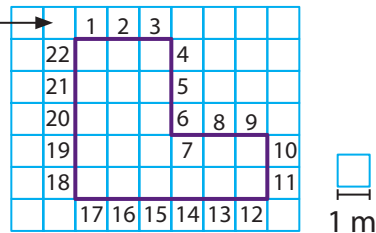




**Learning Target:** Find perimeters of figures.

**Example** Find the perimeter of the figure.

Choose a unit to begin counting. Count each unit around the figure.

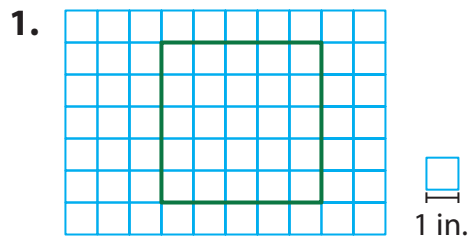


Each unit is 1 meter.

There are 22 units around the figure.

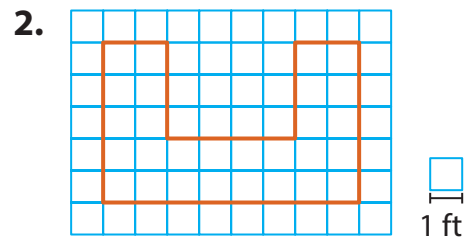
So, the perimeter is 22 meters.

Find the perimeter of the figure.



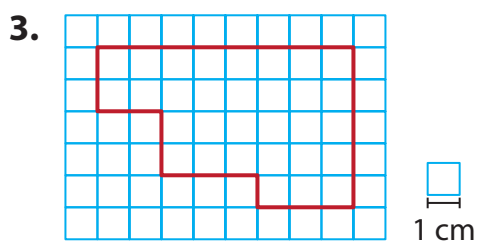
There are \_\_\_\_\_ units around the figure.

So, the perimeter is \_\_\_\_\_ inches.

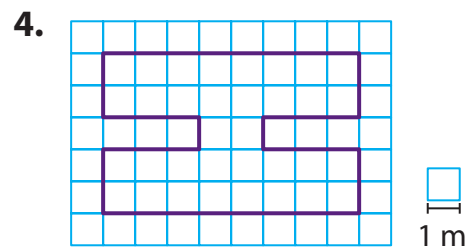


There are \_\_\_\_\_ units around the figure.

So, the perimeter is \_\_\_\_\_ feet.

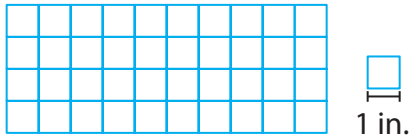


Perimeter = \_\_\_\_\_



Perimeter = \_\_\_\_\_

5. Draw a figure that has a perimeter of 18 inches.



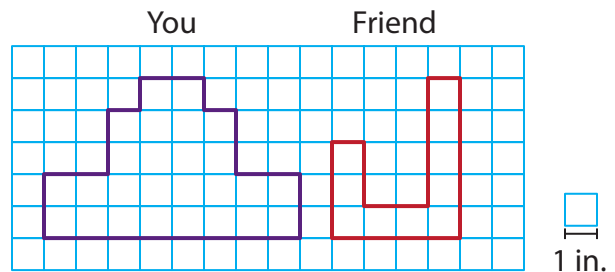
6. **MP Reasoning** Which color represents the perimeter of the rectangle? What does the other color represent?



7. **Modeling Real Life** Use a centimeter ruler to find the perimeter of the library card.



8. **Modeling Real Life** How much greater is the perimeter of your piece of fabric than the perimeter of your friend's piece of fabric?



### Review & Refresh

Write two equivalent fractions for the whole number.

9.  $1 = \frac{\square}{4} = \frac{\square}{6}$

10.  $4 = \frac{\square}{1} = \frac{\square}{2}$

11.  $6 = \frac{\square}{4} = \frac{\square}{6}$



**Learning Target:** Find perimeters of polygons.

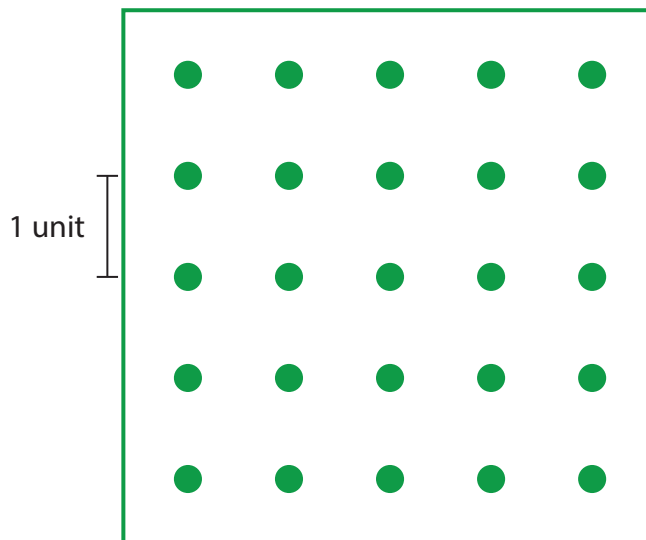
**Success Criteria:**

- I can add all the side lengths to find the perimeter of a polygon.
- I can multiply to find the perimeter of some polygons.



## Explore and Grow

Model a rectangle on your geoboard. Draw the rectangle and label its side lengths. Then find the perimeter in more than one way.



\_\_\_\_\_ units



**Critique the Reasoning of Others** Compare your methods of finding the perimeter to your partner's methods. Explain how they are alike or different.



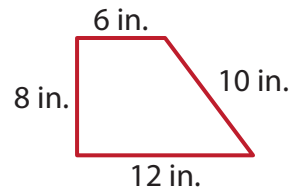
## Think and Grow: Find Perimeter

**Example** Find the perimeter of the trapezoid.

You can find the perimeter of a figure by adding all of the side lengths.

$$\underline{\quad} + \underline{\quad} + \underline{\quad} + \underline{\quad} = P$$

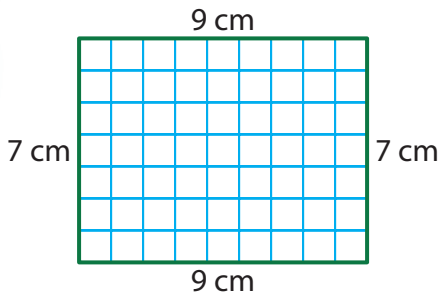
$$\underline{\quad} = P$$



Write an equation. The letter  $P$  represents the unknown perimeter. Add the side lengths.

So, the perimeter is \_\_\_\_\_.

**Example** Find the perimeter of the rectangle.



Because a rectangle has two pairs of equal sides, you can also use multiplication to solve.

Remember, you can count each unit around the rectangle to find the perimeter.



**One Way:**

$$\underline{\quad} + \underline{\quad} + \underline{\quad} + \underline{\quad} = P$$

$$\underline{\quad} = P$$

**Another Way:**

$$2 \times \underline{\quad} + 2 \times \underline{\quad} = P$$

$$\underline{\quad} + \underline{\quad} = P$$

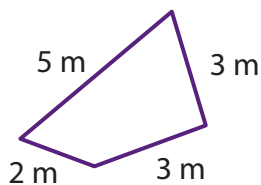
$$\underline{\quad} = P$$

So, the perimeter is \_\_\_\_\_.

## Show and Grow

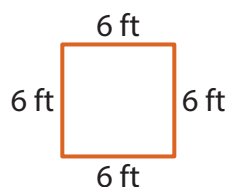
Find the perimeter of the polygon.

1.



The perimeter is \_\_\_\_\_.

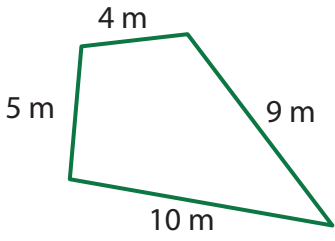
2.

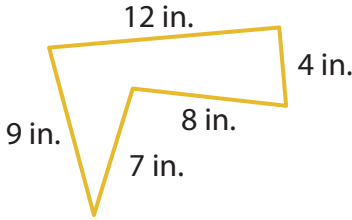


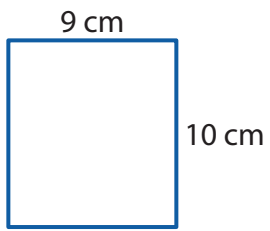
The perimeter is \_\_\_\_\_.

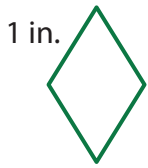
**Apply and Grow: Practice**


Find the perimeter of the polygon.

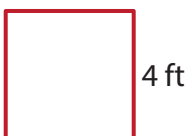
**3.**  Perimeter = \_\_\_\_\_

**4.**  Perimeter = \_\_\_\_\_

**5.** Rectangle  Perimeter = \_\_\_\_\_

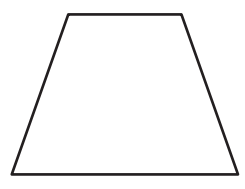
**6.** Rhombus  Perimeter = \_\_\_\_\_

**7.** Parallelogram  Perimeter = \_\_\_\_\_

**8.** Square  Perimeter = \_\_\_\_\_

**9.** You build a pentagon out of wire for a social studies project. Each side is 8 centimeters long. What is the perimeter of the pentagon?

**10.** **MP Number Sense** The top length of the trapezoid is 4 feet. The bottom length is double the top. The left and right lengths are each 2 feet less than the bottom. Label the side lengths and find the perimeter of the trapezoid.



**11. Writing** Explain how finding the perimeter of a rectangle is different from finding its area.

**12. DIG DEEPER!** A rectangle has a perimeter of 12 feet. What could its side lengths be?





## Think and Grow: Modeling Real Life

The rectangular sign is 34 feet longer than it is wide. What is the perimeter of the sign?



Understand the problem:

Make a plan:

Solve:

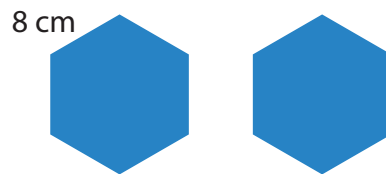
The perimeter is \_\_\_\_\_.

## Show and Grow

**13.** A city has a rectangular sidewalk in a park. The sidewalk is 4 feet wide and is 96 feet longer than it is wide. What is the perimeter of the sidewalk?

**14.** A team jogs around a rectangular field three times. The field is 80 yards long and 60 yards wide. How many yards does the team jog?

**15.** Each side of the tiles is 8 centimeters long. What is the sum of the perimeters?

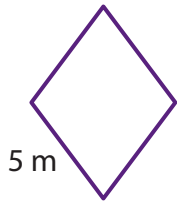


You put the tiles together as shown. Is the perimeter of this new shape the same as the sum of the perimeters above? Explain.



**Learning Target:** Find perimeters of polygons.

**Example** Find the perimeter of the rhombus.



Because a rhombus has four equal sides, you can also use multiplication to solve.

**One Way:**

$$\underline{5} + \underline{5} + \underline{5} + \underline{5} = P$$

$$\underline{20} = P$$

**Another Way:**

$$4 \times \underline{5} = P$$

$$\underline{20} = P$$

So, the perimeter is 20 meters.



The letter *P* represents the unknown perimeter.



Find the perimeter of the polygon.

**1.**

Perimeter = \_\_\_\_\_

**2.**

Perimeter = \_\_\_\_\_

**3. Square**

Perimeter = \_\_\_\_\_

**4. Parallelogram**

Perimeter = \_\_\_\_\_

**5. Rhombus**

Perimeter = \_\_\_\_\_

**6. Rectangle**

Perimeter = \_\_\_\_\_

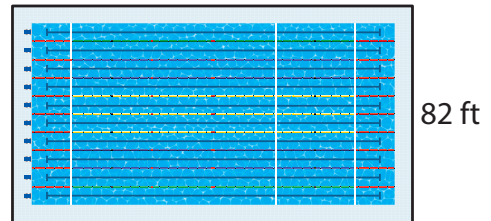
7. Each side of a triangle is 5 centimeters long. What is the perimeter of the triangle?

8. **YOU BE THE TEACHER** Descartes says that a square will always have a greater perimeter than a triangle because it has more sides. Is he correct? Explain.

9. **MP Structure** Draw a pentagon and label its sides so that it has the same perimeter as the rectangle.



10. **Modeling Real Life** An Olympic swimming pool is 82 feet longer than it is wide. What is the perimeter of the swimming pool?



11. **Modeling Real Life** You put painter's tape around two rectangular windows. The windows are each 52 inches long and 28 inches wide. How much painter's tape do you need?

### Review & Refresh

Find the sum.

$$\begin{array}{r} 12. \quad 590 \\ + 147 \\ \hline \end{array}$$

$$\begin{array}{r} 13. \quad 636 \\ + 258 \\ \hline \end{array}$$

$$\begin{array}{r} 14. \quad 476 \\ + 329 \\ \hline \end{array}$$



**Learning Target:** Use perimeter to find the unknown side lengths of a polygon.

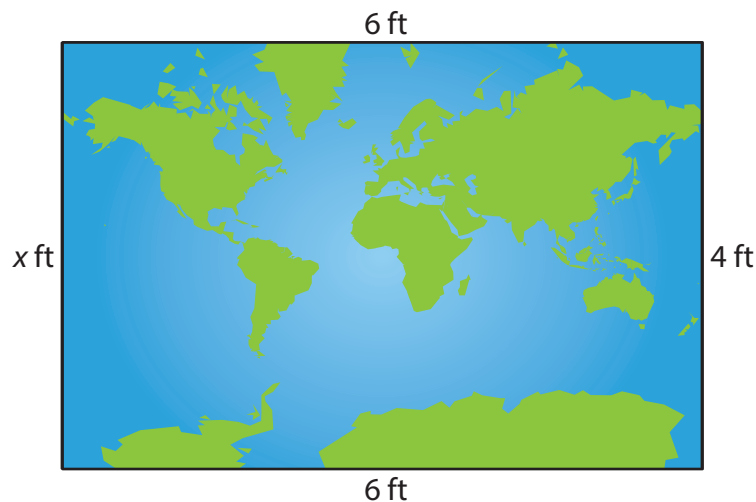
**Success Criteria:**

- I can use perimeter to find an unknown side length.
- I can use multiplication and the perimeter to find the unknown side length when all sides are equal.



## Explore and Grow

You have a map with the three side lengths shown. The perimeter of the map is 20 feet. Describe how you can find the fourth side length of your map without measuring.

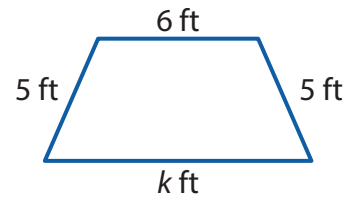


**Repeated Reasoning** How is finding the unknown side length of a square different from finding the unknown side length of a rectangle?



# Think and Grow: Find Unknown Side Lengths

**Example** The perimeter of the trapezoid is 26 feet.  
Find the unknown side length.



$$k + \underline{\quad} + \underline{\quad} + \underline{\quad} = 26$$

Write an equation for the perimeter.

$$k + 16 = 26$$

Add the known side lengths.

$$\underline{\quad} + 16 = 26$$

What number plus 16 equals 26?

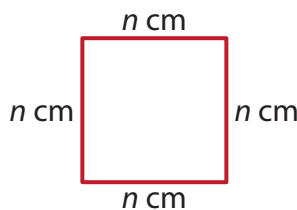
$$\text{So, } k = \underline{\quad}.$$

The unknown side length is \_\_\_\_\_.

Because the square has 4 equal sides, use a multiplication equation to find each unknown side length.



**Example** The perimeter of the square is 32 centimeters. Find the length of each side of the square.



$$4 \times n = 32$$

Write an equation for the perimeter.

$$4 \times \underline{\quad} = 32$$

4 times what number equals 32?

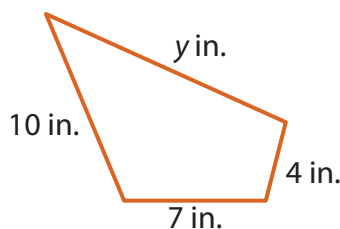
$$\text{So, } n = \underline{\quad}.$$

So, the length of each side is \_\_\_\_\_.

## Show and Grow

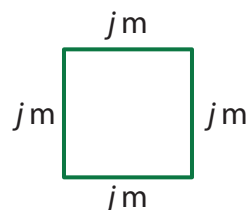
Find the unknown side length.

1. Perimeter = 34 inches



$$y = \underline{\quad}$$

2. Perimeter = 20 meters

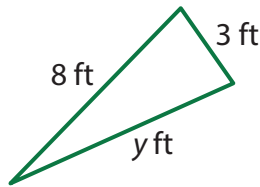


$$j = \underline{\quad}$$

**Apply and Grow: Practice**

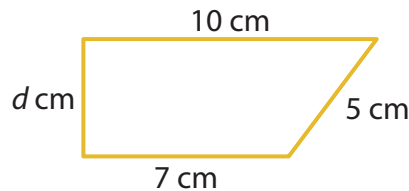
Find the unknown side length.

3. Perimeter = 19 feet



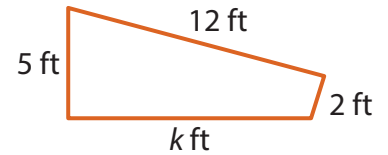
$y =$  \_\_\_\_\_

4. Perimeter = 26 centimeters



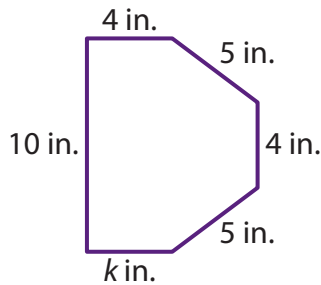
$d =$  \_\_\_\_\_

5. Perimeter = 30 feet



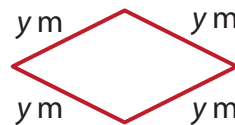
$k =$  \_\_\_\_\_

6. Perimeter = 32 inches



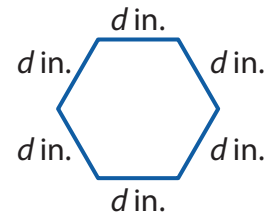
$k =$  \_\_\_\_\_

7. Perimeter = 8 meters



$y =$  \_\_\_\_\_

8. Perimeter = 48 inches

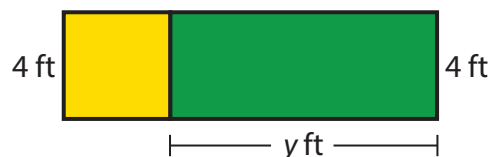


$d =$  \_\_\_\_\_

9. **MP Number Sense** A rectangle has a perimeter of 30 centimeters. The left side is 7 centimeters long. What is the length of the top side?

10. **Writing** A triangle has three equal sides and a perimeter of 21 meters. Explain how to use division to find the side lengths.

11. **DIG DEEPER!** Newton draws and labels the square and rectangle below. The perimeter of the combined shape is 36 feet. Find the unknown side length.





## Think and Grow: Modeling Real Life

The perimeter of the rectangular vegetable garden is 30 meters. What are the lengths of the other three sides?



6 m

Understand the problem:

Make a plan:

Solve:

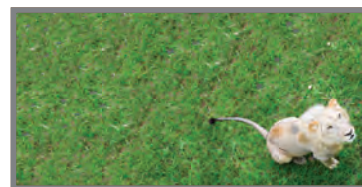
The lengths of the other three sides are

\_\_\_\_\_, \_\_\_\_\_, and \_\_\_\_\_.

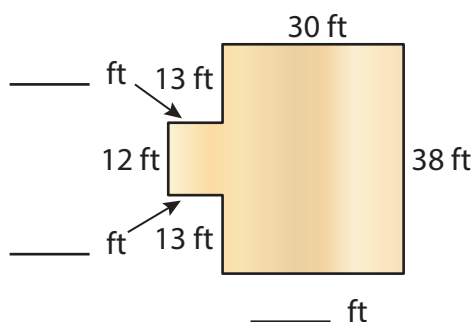
## Show and Grow

12. The perimeter of the rectangular zoo enclosure is 34 meters. What are the lengths of the other three sides?

12 m



13. The floor of an apartment is made of two rectangles. The perimeter is 154 feet. What are the lengths of the other three sides?



14. **DIG DEEPER!** You want to make a flower bed in the shape of a pentagon. Two sides of the flower bed are each 7 inches long, and two sides are each 16 inches long. The perimeter is 57 inches. Sketch the flower bed and label all of the side lengths.



**Learning Target:** Use perimeter to find the unknown side lengths of a polygon.

**Example** The perimeter of the quadrilateral is 29 centimeters. Find the unknown side length.

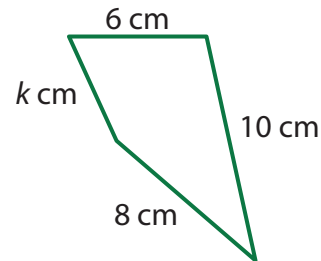


$$k + \underline{6} + \underline{10} + \underline{8} = 29$$

$$k + 24 = 29$$

$$\underline{5} + 24 = 29$$

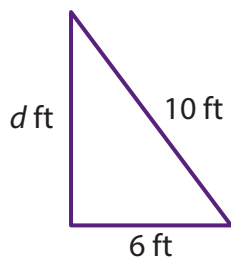
So,  $k = \underline{5}$ .



The unknown side length is 5 centimeters.

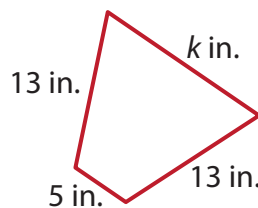
Find the unknown side length.

1. Perimeter = 24 feet



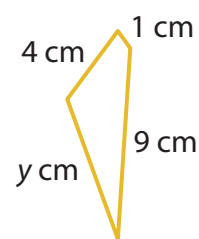
$d = \underline{\hspace{2cm}}$

2. Perimeter = 46 inches



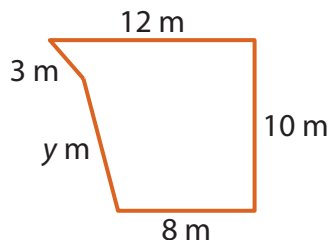
$k = \underline{\hspace{2cm}}$

3. Perimeter = 21 centimeters



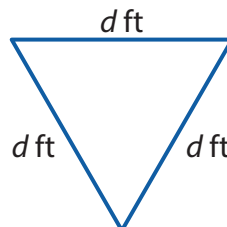
$y = \underline{\hspace{2cm}}$

4. Perimeter = 41 meters



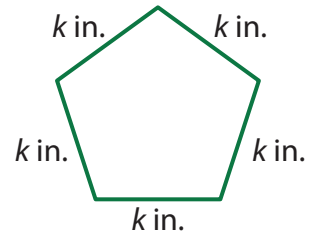
$y = \underline{\hspace{2cm}}$

5. Perimeter = 12 feet



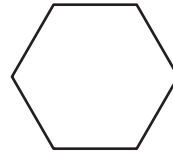
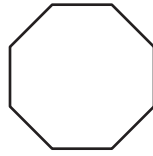
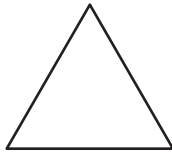
$d = \underline{\hspace{2cm}}$

6. Perimeter = 50 inches



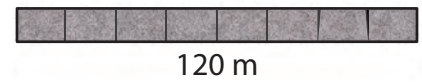
$k = \underline{\hspace{2cm}}$

7. **DIG DEEPER!** Each polygon has equal side lengths that are whole numbers. Which polygon could have a perimeter of 16 centimeters? Explain.

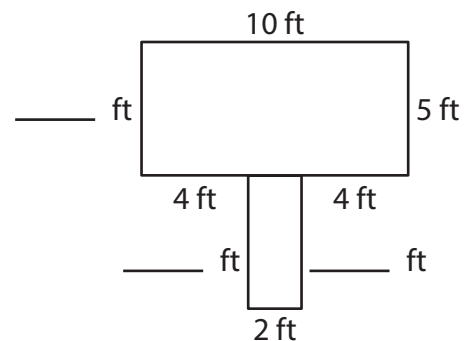


8. **MP Number Sense** The area of a square is 25 square inches. What is its perimeter?

9. **Modeling Real Life** The perimeter of the rectangular sidewalk is 260 meters. What are the lengths of the other three sides?



10. **Modeling Real Life** Two rectangular tables are pushed together. The perimeter is 40 feet. What are the lengths of the other three sides?



### Review & Refresh

Write the time. Write another way to say the time.

11.



12.



13.



**Learning Target:** Use area to compare rectangles with the same perimeter.

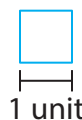
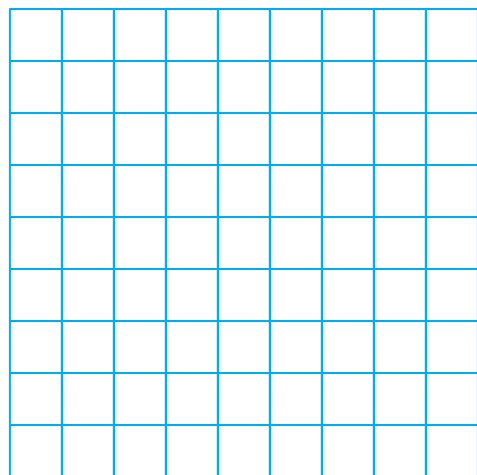
**Success Criteria:**

- I can find the perimeter and area of a given rectangle.
- I can draw a rectangle with the same perimeter as a given rectangle.
- I can compare the areas of the rectangles.



## Explore and Grow

Use color tiles to create two different rectangles that each have a perimeter of 16 units. Then draw your rectangles and label their dimensions. Do the rectangles have the same area? Explain how you know.



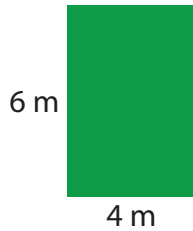
**Repeated Reasoning** Draw another rectangle that has the same perimeter but different dimensions. Compare the area of the new rectangle to the rectangles above. What do you notice?



## Think and Grow: Same Perimeter, Different Areas

**Example** Find the perimeter and the area of Rectangle A. Draw a different rectangle that has the same perimeter. Which rectangle has the greater area?

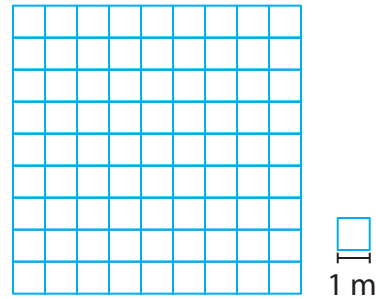
Rectangle A



$$\begin{aligned} \text{Perimeter} &= 4 + 6 + 4 + 6 \\ &= \underline{\hspace{2cm}} \end{aligned}$$

$$\text{Area} = 6 \times 4 = \underline{\hspace{2cm}}$$

Rectangle B



$$\begin{aligned} \text{Perimeter} &= \underline{\hspace{1cm}} + \underline{\hspace{1cm}} + \underline{\hspace{1cm}} + \underline{\hspace{1cm}} \\ &= \underline{\hspace{2cm}} \end{aligned}$$

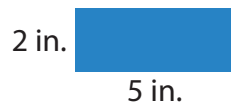
$$\text{Area} = \underline{\hspace{1cm}} \times \underline{\hspace{1cm}} = \underline{\hspace{2cm}}$$

Rectangle \_\_\_\_\_ has the greater area.

## Show and Grow

1. Find the perimeter and area of Rectangle A. Draw a different rectangle that has the same perimeter. Which rectangle has the greater area?

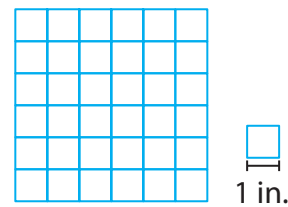
Rectangle A



$$\text{Perimeter} = \underline{\hspace{2cm}}$$

$$\text{Area} = \underline{\hspace{2cm}}$$

Rectangle B



$$\text{Perimeter} = \underline{\hspace{2cm}}$$

$$\text{Area} = \underline{\hspace{2cm}}$$

Rectangle \_\_\_\_\_ has the greater area.



 **Apply and Grow: Practice**

Find the perimeter and area of Rectangle A. Draw a different rectangle that has the same perimeter. Which rectangle has the greater area?

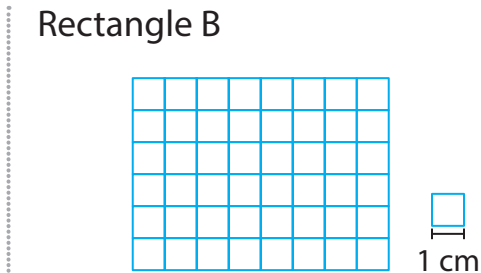
**2. Rectangle A**



Perimeter = \_\_\_\_\_

Area = \_\_\_\_\_

**Rectangle B**



Perimeter = \_\_\_\_\_

Area = \_\_\_\_\_

Rectangle \_\_\_\_\_ has the greater area.

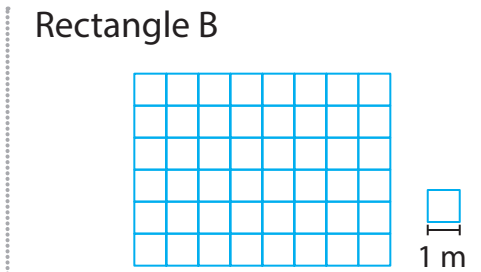
**3. Rectangle A**



Perimeter = \_\_\_\_\_

Area = \_\_\_\_\_


**Rectangle B**

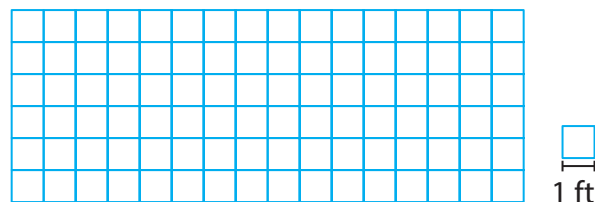


Perimeter = \_\_\_\_\_

Area = \_\_\_\_\_

Rectangle \_\_\_\_\_ has the greater area.

**4.  Structure** Draw a rectangle that has the same perimeter as the one shown, but with a lesser area. What is the area?





## Think and Grow: Modeling Real Life

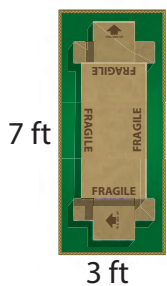
A paleontologist has 12 meters of twine to rope off a rectangular section of the ground. How long and wide should she make the roped-off section so it has the greatest possible area?

Draw to show:

She should make the roped-off section \_\_\_\_\_ meters long and \_\_\_\_\_ meters wide.

## Show and Grow

5. Newton has 16 feet of wood to make a rectangular sandbox. How long and wide should he make the sandbox so it has the greatest possible area?



6. **DIG DEEPER!** You and Newton are building forts. You each have the same length of rope to make a rectangular perimeter for the fort on the ground. Your roped-off section is shown. Newton's section has a greater area than yours. Draw one way Newton could rope off his fort.

Descartes also builds a fort. He has the same length of rope as you to make a perimeter around his fort. Descartes's roped-off section has a lesser area than yours. Draw one way Descartes could rope off his fort.

**Learning Target:** Use area to compare rectangles with the same perimeter.

**Example** Find the perimeter and the area of Rectangle A. Draw a different rectangle that has the same perimeter? Which rectangle has the greater area?



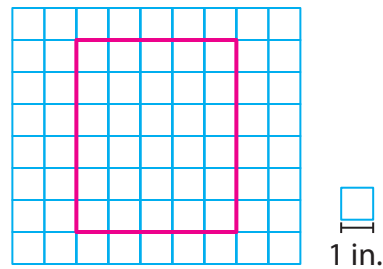
Rectangle A



$$\begin{aligned} \text{Perimeter} &= 9 + 2 + 9 + 2 \\ &= \underline{22 \text{ inches}} \end{aligned}$$

$$\begin{aligned} \text{Area} &= 9 \times 2 \\ &= \underline{18 \text{ square inches}} \end{aligned}$$

Rectangle B



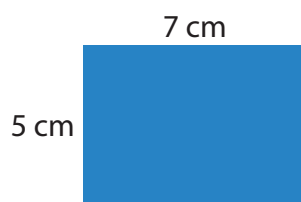
$$\begin{aligned} \text{Perimeter} &= \underline{6} + \underline{5} + \underline{6} + \underline{5} \\ &= \underline{22 \text{ inches}} \end{aligned}$$

$$\begin{aligned} \text{Area} &= \underline{6} \times \underline{5} \\ &= \underline{30 \text{ square inches}} \end{aligned}$$

Rectangle B has the greater area.

- Find the perimeter and area of Rectangle A. Draw a different rectangle that has the same perimeter. Which rectangle has the greater area?

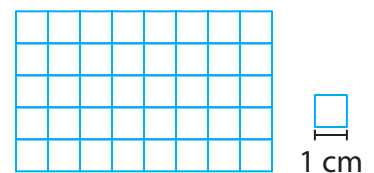
Rectangle A



Perimeter = \_\_\_\_\_

Area = \_\_\_\_\_

Rectangle B

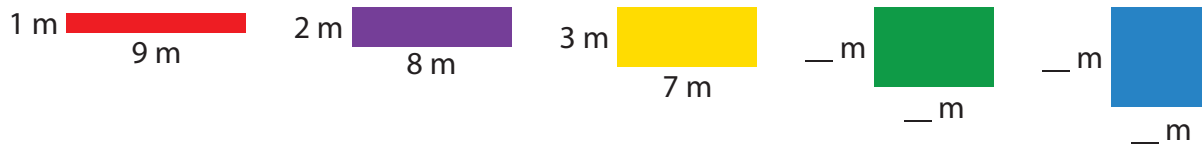


Perimeter = \_\_\_\_\_

Area = \_\_\_\_\_

Rectangle \_\_\_\_\_ has the greater area.

2. **MP Patterns** Complete the pattern. Find the area of each rectangle.



Each rectangle has the same perimeter. As the area increases, what do you notice about the shape of the rectangle?



3. **Modeling Real Life** You are making a card with a 36-centimeter ribbon border. How long and wide should you make the card so you have the greatest possible area to write?

4. **DIG DEEPER!** A school has two rectangular playgrounds that each have the same perimeter. The first playground is shown. The second has a lesser area than the first. Draw one way the second playground could look.



The school builds another playground. It has the same perimeter as the first. The third playground has a greater area than the first. Draw one way the third playground could look.

### Review & Refresh

Find the product.

5.  $2 \times 30 = \underline{\quad}$

6.  $6 \times 20 = \underline{\quad}$

7.  $3 \times 90 = \underline{\quad}$

**Learning Target:** Use perimeter to compare rectangles with the same area.

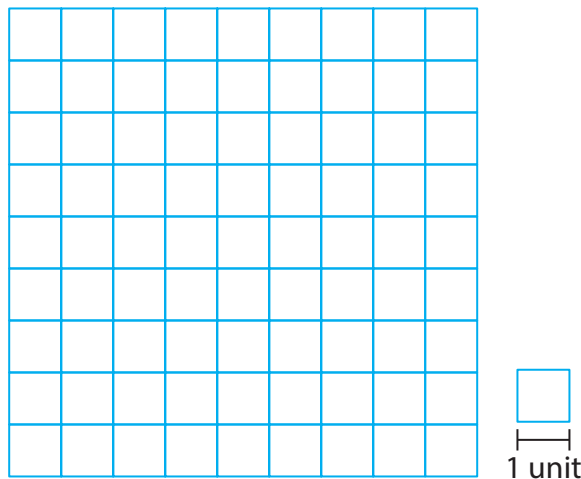
**Success Criteria:**

- I can find the area and perimeter of a given rectangle.
- I can draw a different rectangle with the same area as a given rectangle.
- I can compare the perimeters of the rectangles.



## Explore and Grow

Use color tiles to create two different rectangles that each have an area of 18 square units. Then draw your rectangles and label their dimensions. Do the rectangles have the same perimeter? Explain how you know.



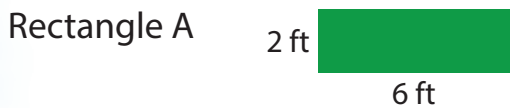
**Repeated Reasoning** As the perimeter increases and the area stays the same, what do you notice about the shape of the rectangle?





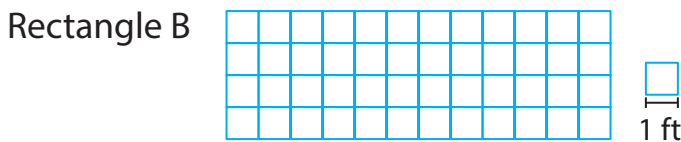
## Think and Grow: Same Area, Different Perimeters

**Example** Find the area and the perimeter of Rectangle A. Draw a different rectangle that has the same area. Which rectangle has the lesser perimeter?



$$\begin{aligned} \text{Area} &= 2 \times 6 \\ &= \underline{\hspace{2cm}} \end{aligned}$$

$$\begin{aligned} \text{Perimeter} &= 6 + 2 + 6 + 2 \\ &= \underline{\hspace{2cm}} \end{aligned}$$



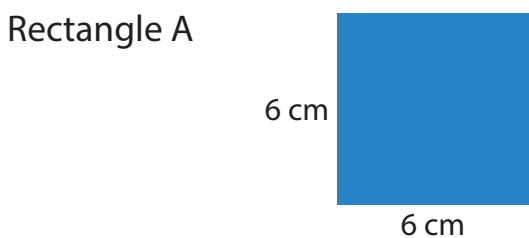
$$\begin{aligned} \text{Area} &= \underline{\hspace{1cm}} \times \underline{\hspace{1cm}} \\ &= \underline{\hspace{2cm}} \end{aligned}$$

$$\begin{aligned} \text{Perimeter} &= \underline{\hspace{1cm}} + \underline{\hspace{1cm}} + \underline{\hspace{1cm}} + \underline{\hspace{1cm}} \\ &= \underline{\hspace{2cm}} \end{aligned}$$

Rectangle \_\_\_\_\_ has the lesser perimeter.

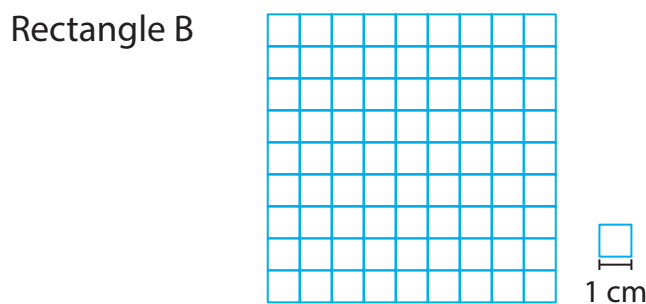
## Show and Grow

1. Find the area and the perimeter of Rectangle A. Draw a different rectangle that has the same area. Which rectangle has the lesser perimeter?



$$\text{Area} = \underline{\hspace{2cm}}$$

$$\text{Perimeter} = \underline{\hspace{2cm}}$$



$$\text{Area} = \underline{\hspace{2cm}}$$

$$\text{Perimeter} = \underline{\hspace{2cm}}$$

Rectangle \_\_\_\_\_ has the lesser perimeter.

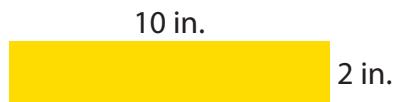
Name \_\_\_\_\_



## Apply and Grow: Practice

Find the area and the perimeter of Rectangle A. Draw a different rectangle that has the same area. Which rectangle has the lesser perimeter?

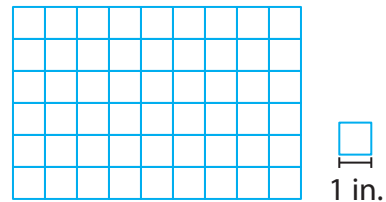
### 2. Rectangle A



Area = \_\_\_\_\_

Perimeter = \_\_\_\_\_

### Rectangle B



Area = \_\_\_\_\_

Perimeter = \_\_\_\_\_

Rectangle \_\_\_\_\_ has the lesser perimeter.

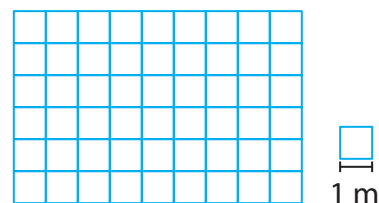
### 3. Rectangle A



Area = \_\_\_\_\_

Perimeter = \_\_\_\_\_

### Rectangle B



Area = \_\_\_\_\_

Perimeter = \_\_\_\_\_

Rectangle \_\_\_\_\_ has the lesser perimeter.

4. **DIG DEEPER!** The perimeter of a blue rectangle is 10 feet. The perimeter of a green rectangle is 14 feet. Both rectangles have the same area. Find the area and the dimensions of each rectangle.



## Think and Grow: Modeling Real Life

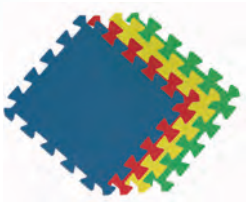
You have 40 square patio bricks that are each 1 foot long and 1 foot wide. You want to make a rectangular patio with all of the bricks. How long and wide should you make the patio so it has the least possible perimeter?



Draw to show:

You should make the patio \_\_\_\_\_ feet long and \_\_\_\_\_ feet wide.

## Show and Grow



5. Your friend has 16 square foam tiles that are each 1 foot long and 1 foot wide. He wants to make a rectangular exercise space with all of the tiles. How long and wide should he make the exercise space so it has the least possible perimeter?

6. **DIG DEEPER!** You and your friend each use fencing to make a rectangular playpen for a puppy. Each pen has the same area. Your pen is shown. Your friend's pen uses less fencing than yours. Draw one way your friend could make her pen.



Your cousin makes a playpen for a puppy. His pen has the same area as your pen. Your cousin's pen uses more fencing than yours. Draw one way your cousin could make his pen.

**Learning Target:** Use perimeter to compare rectangles with the same area.



**Example** Find the area and the perimeter of Rectangle A. Draw a different rectangle that has the same area. Which rectangle has the lesser perimeter?

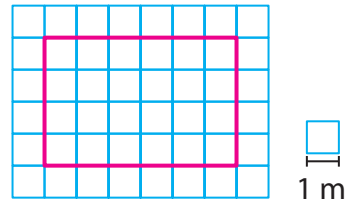
Rectangle A



$$\begin{aligned} \text{Area} &= 3 \times 8 \\ &= \underline{24 \text{ square meters}} \end{aligned}$$

$$\begin{aligned} \text{Perimeter} &= 3 + 8 + 3 + 8 \\ &= \underline{22 \text{ meters}} \end{aligned}$$

Rectangle B



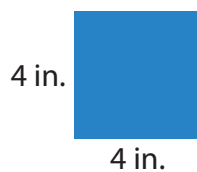
$$\begin{aligned} \text{Area} &= \underline{4} \times \underline{6} \\ &= \underline{24 \text{ square meters}} \end{aligned}$$

$$\begin{aligned} \text{Perimeter} &= \underline{4} + \underline{6} + \underline{4} + \underline{6} \\ &= \underline{20 \text{ meters}} \end{aligned}$$

Rectangle B has the lesser perimeter.

1. Find the area and the perimeter of Rectangle A. Draw a different rectangle that has the same area. Which rectangle has the lesser perimeter?

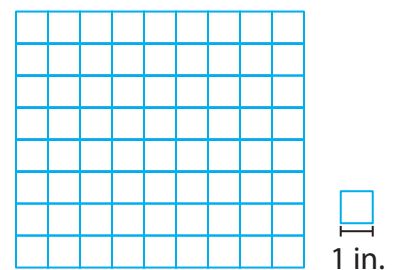
Rectangle A



$$\text{Area} = \underline{\hspace{2cm}}$$

$$\text{Perimeter} = \underline{\hspace{2cm}}$$

Rectangle B

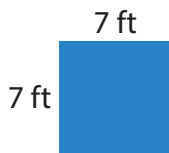


$$\text{Area} = \underline{\hspace{2cm}}$$

$$\text{Perimeter} = \underline{\hspace{2cm}}$$

Rectangle      has the lesser perimeter.

2. **MP Structure** The dimensions of a rectangle are 4 feet by 10 feet. Which shape has the same area, but a different perimeter?



3. **MP Reasoning** The two fields have the same area. Players run one lap around each field. At which field do the players run farther? Explain.

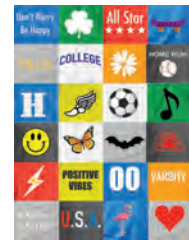
Field A



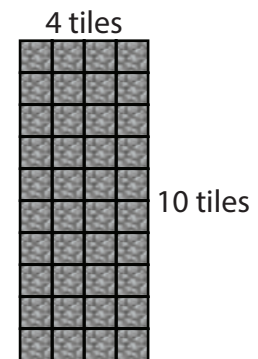
Field B



4. **Modeling Real Life** You have 24 square pieces of T-shirt that are each 1 foot long and 1 foot wide. You want to make a rectangular T-shirt quilt with all of the pieces. How long and wide should you make the quilt so it has the least possible perimeter?



5. **DIG DEEPER!** You and Descartes each have 40 cobblestone tiles to arrange into a rectangular pathway. Your pathway is shown. Descartes's pathway has a lesser perimeter than yours. Draw one way Descartes could make his pathway.



Newton also makes a rectangular pathway with 40 cobblestone tiles. His pathway has a greater perimeter than yours. Draw one way Newton could make his pathway.

### Review & Refresh

Identify the number of right angles and pairs of parallel sides.

6. Right angles: \_\_\_\_\_  
Pairs of parallel sides: \_\_\_\_\_

7. Right angles: \_\_\_\_\_  
Pairs of parallel sides: \_\_\_\_\_





You and your cousin build a tree house.

1. The floor of the tree house is in the shape of a quadrilateral with parallel sides that are 4 feet long and 10 feet long. The other 2 sides are equal in length. The perimeter is 24 feet. Sketch the floor and label all of the side lengths.

---

2. Each rectangular wall of the tree house is 5 feet tall. How many square feet of wood is needed for all of the walls?

---

3. You cut out a door in the shape of a rectangle with sides that are whole numbers. Its area is 8 square feet. What is the height of the door?

---

4. You want to paint the floor and walls on the inside of your tree house. The area of the floor is 28 square feet. Each quart of paint covers 100 square feet.
  - a. How many quarts of paint do you need to buy?

---

  - b. Do you have enough paint to paint the outside walls of the tree house? Explain.

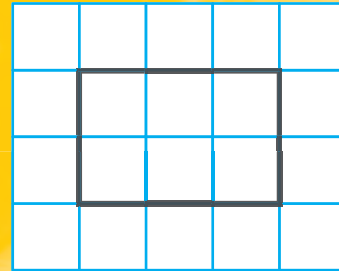


# Perimeter Roll and Conquer

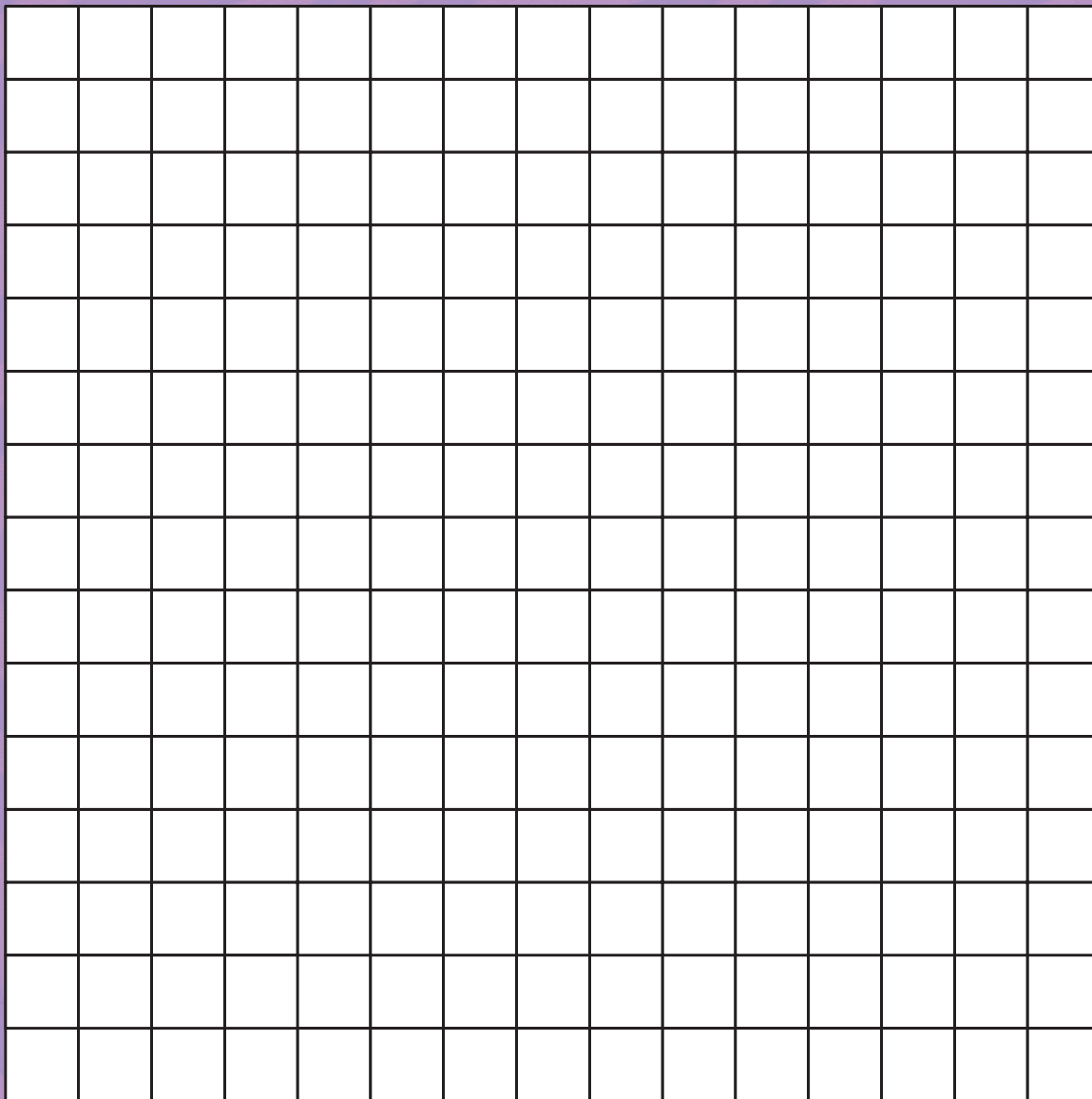
## Directions:

1. Players take turns rolling two dice.
2. On your turn, draw a rectangle on the board using the numbers on the dice as the side lengths. Your rectangle cannot cover another rectangle.
3. Write an equation to find the perimeter of the rectangle.
4. If you cannot fit a rectangle on the board, then you lose your turn. Play 10 rounds, if possible.
5. Add all of your rectangles' perimeters together. The player with the greatest sum wins!

Example:

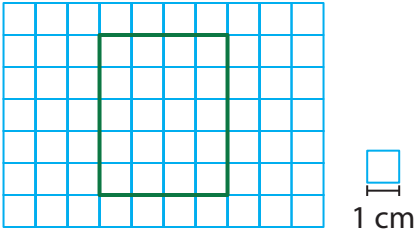


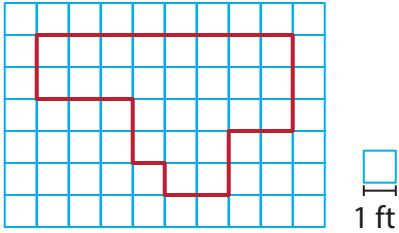
$$2 \times 2 + 2 \times 3 = 10$$



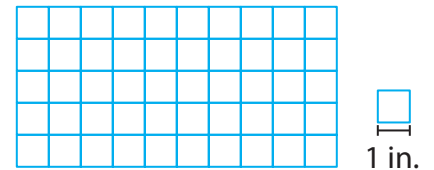
**15.1 Understand Perimeter**

Find the perimeter of the figure.

1.    
 Perimeter = \_\_\_\_\_

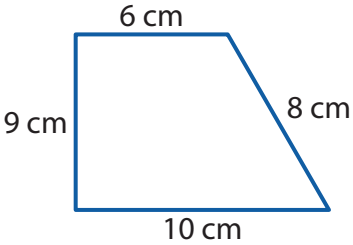
2.    
 Perimeter = \_\_\_\_\_

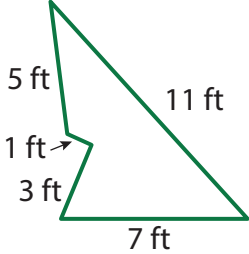
3. Draw a figure that has a perimeter of 10 inches.

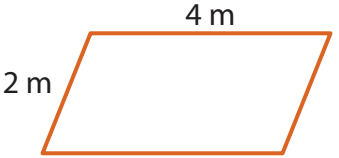


**15.2 Find Perimeter of Polygons**

Find the perimeter of the polygon.

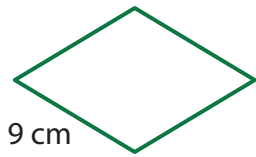
4.    
 Perimeter = \_\_\_\_\_

5.    
 Perimeter = \_\_\_\_\_

6. Parallelogram    
 Perimeter = \_\_\_\_\_

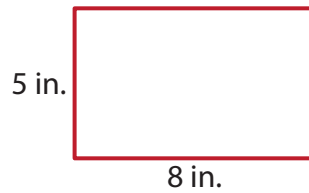
Find the perimeter of the polygon.

7. Rhombus



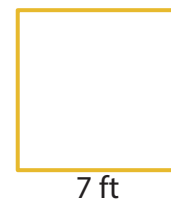
Perimeter = \_\_\_\_\_

8. Rectangle



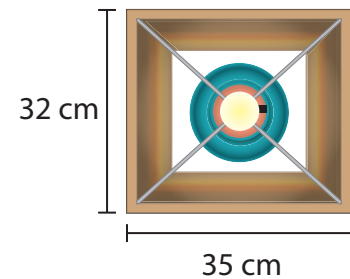
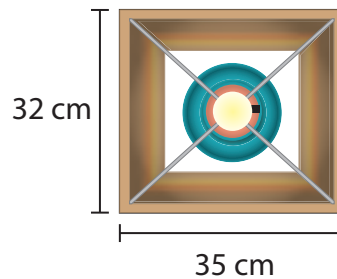
Perimeter = \_\_\_\_\_

9. Square



Perimeter = \_\_\_\_\_

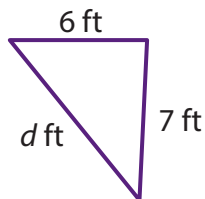
10. **Modeling Real Life** You want to put lace around the tops of the two rectangular lampshades. How many centimeters of lace do you need?



## 15.3 Find Unknown Side Lengths

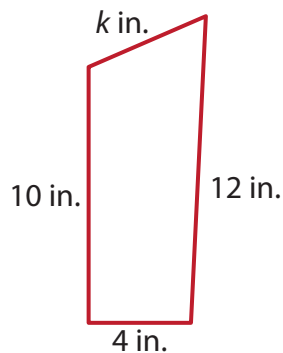
Find the unknown side length.

11. Perimeter = 22 feet



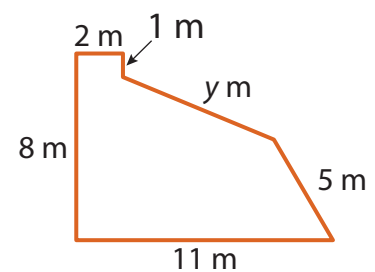
$d =$  \_\_\_\_\_

12. Perimeter = 31 inches



$k =$  \_\_\_\_\_

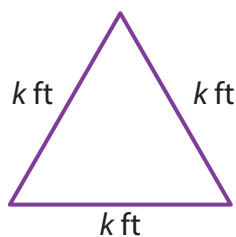
13. Perimeter = 34 meters



$y =$  \_\_\_\_\_

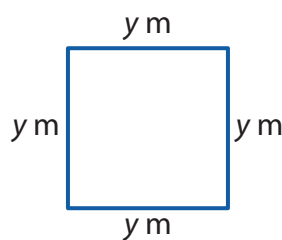
Find the unknown side length.

14. Perimeter = 24 feet



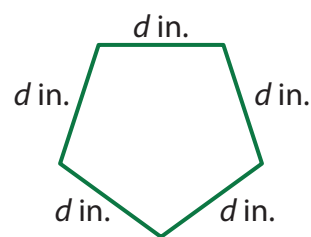
$k =$  \_\_\_\_\_

15. Perimeter = 16 meters



$y =$  \_\_\_\_\_

16. Perimeter = 30 inches



$d =$  \_\_\_\_\_

17. **MP Number Sense** A rectangle has a perimeter of 38 centimeters. The left side length is 10 centimeters. What is the length of the top side?

## 15.4 Same Perimeter, Different Areas

18. Find the perimeter and area of Rectangle A. Draw a different rectangle that has the same perimeter. Which rectangle has the greater area?

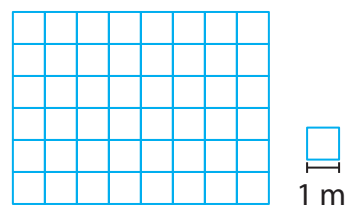
Rectangle A



Perimeter = \_\_\_\_\_

Area = \_\_\_\_\_

Rectangle B



Perimeter = \_\_\_\_\_

Area = \_\_\_\_\_

Rectangle \_\_\_\_\_ has the greater area.



19. **MP Patterns** Each rectangle has the same perimeter. Are the areas increasing or decreasing? Explain.



## 15.5 Same Area, Different Perimeters

20. Find the area and the perimeter of Rectangle A. Draw a different rectangle that has the same area. Which rectangle has the lesser perimeter?

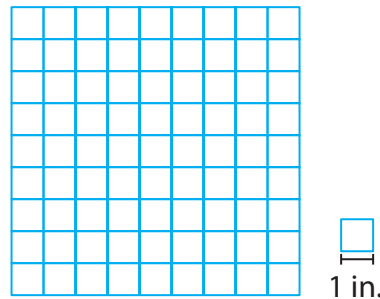
Rectangle A



Area = \_\_\_\_\_

Perimeter = \_\_\_\_\_

Rectangle B



Area = \_\_\_\_\_

Perimeter = \_\_\_\_\_

Rectangle \_\_\_\_\_ has the lesser perimeter.

21. **MP Reasoning** The two dirt-bike parks have the same area. Kids ride dirt bikes around the outside of each park. At which park do the kids ride farther? Explain.



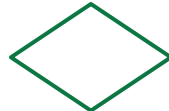
# Cumulative Practice 1-15

1. A mango has a mass that is 369 grams greater than the apple. What is the mass of the mango?

(A) 471 grams                      (B) 369 grams  
(C) 267 grams                      (D) 461 grams



2. Which term describes two of the shapes shown, but *not* all three of the shapes?



(A) polygon                      (B) rectangle  
(C) square                      (D) parallelogram

3. A rectangular note card has an area of 35 square inches. The length of one of its sides is 7 inches. What is the perimeter of the note card?

(A) 5 inches                      (B) 24 inches  
(C) 84 inches                      (D) 12 inches

4. How many minutes are equivalent to 4 hours?

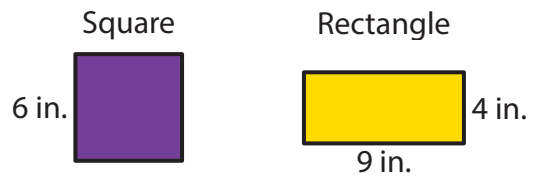
(A) 400 minutes                      (B) 240 minutes  
(C) 24 minutes                      (D) 40 minutes

5. A balloon artist has 108 balloons. He has 72 white balloons, and an equal number of red, blue, green, and purple balloons. How many purple balloons does he have?

(A) 36      (B) 180      (C) 9      (D) 32



6. Which statements about the figures are true?



- The shapes have different perimeters.       The shapes have the same areas.
- The shapes have the same perimeters.       The shapes have different areas.

7. The graph shows how many students ordered each lunch option.

Think  
Solve  
Explain

| Lunch Orders                     |  |
|----------------------------------|--|
| Grilled chicken                  |  |
| Turkey hot dog                   |  |
| Peanut butter and jelly sandwich |  |
| Salad bar                        |  |

Each = 6 students.

**Part A** How many students ordered lunch?

**Part B** Choose a lesser value for the key. How will the graph change?

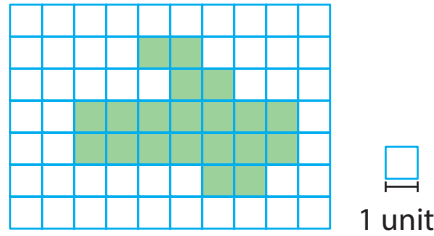
8. Find the sum.



$$\begin{array}{r} 354 \\ 297 \\ 156 \\ + 128 \\ \hline \end{array}$$

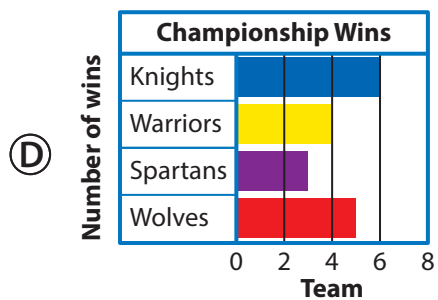
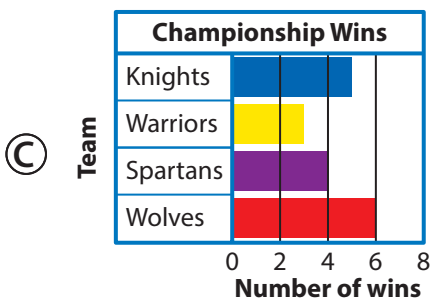
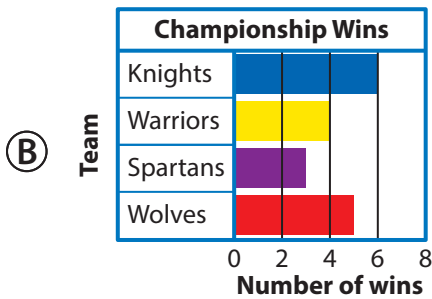
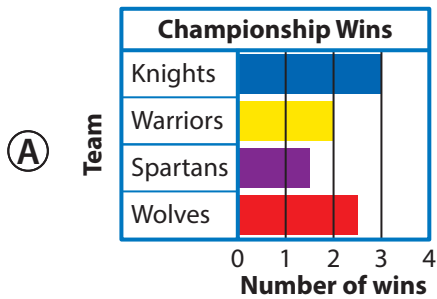
9. What is the perimeter of the figure?

- (A) 26 units
- (B) 22 units
- (C) 20 units
- (D) 16 units

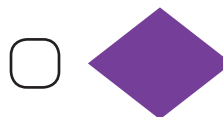


10. Which bar graph correctly shows the data?

| Championship Wins |   |
|-------------------|---|
| Knights           | 6 |
| Warriors          | 4 |
| Spartans          | 3 |
| Wolves            | 5 |

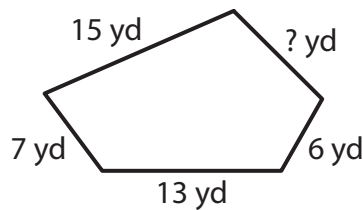


11. Which polygons have at least one pair of parallel sides?



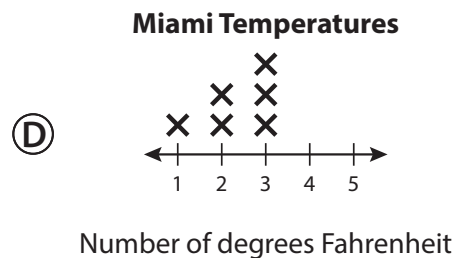
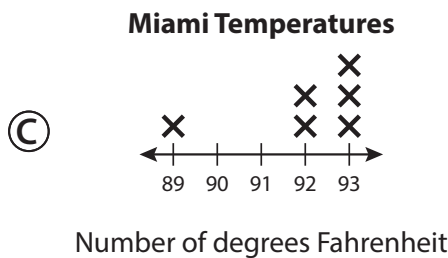
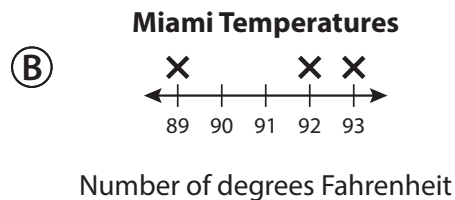
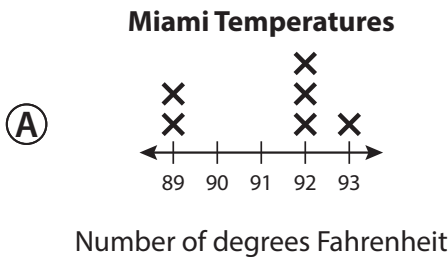
12. The perimeter of the polygon is 50 yards. What is the missing side length?

- (A) 41 yards
- (B) 10 yards
- (C) 91 yards
- (D) 9 yards



13. Which line plot correctly shows the data?

| Miami High Temperatures (degrees Fahrenheit) |    |
|--|----|
| Monday                                       | 89 |
| Tuesday                                      | 92 |
| Wednesday                                    | 92 |
| Thursday                                     | 92 |
| Friday                                       | 93 |
| Saturday                                     | 89 |



14. Your friend is asked to draw a quadrilateral with four right angles. She says it can only be a square. Is she correct?

- (A) Yes, there is no other shape it can be.
- (B) No, it could also be a rectangle.
- (C) No, it could also be a hexagon.
- (D) No, it could also be a trapezoid.

15. Which numbers round to 480 when rounded to the nearest ten?

- 484
- 478
- 472
- 485
- 475
- 489



Name \_\_\_\_\_

# STEAM Performance Task

1-15



1. Use the Internet or some other resource to learn more about crested geckos.
  - a. Write three interesting facts about geckos.



---

b. Geckos need to drink water every day. Is this amount of water measured in *milliliters* or *liters*? Explain.

---

c. Geckos can live in a terrarium. Is the capacity of this terrarium measured in *milliliters* or *liters*? Explain.

---

2. Your class designs a terrarium for a gecko.

a. The base of the terrarium is a hexagon. Each side of the hexagon is 6 inches long. What is the perimeter of the base?

---

b. The terrarium is 20 inches tall. All of the side walls are made of glass. How many square inches of glass is needed for the terrarium?

---

c. Another class designs a terrarium with a rectangular base. All of its sides are equal in length. The base has the same perimeter as the base your class designs. What is the perimeter of the base? What is the area?



3. An online store sells crested geckos. The store owner measures the length of each gecko in the store. The results are shown in the table.

| Crested Gecko Lengths (inches) |                |                |                |                |                |
|--------------------------------|----------------|----------------|----------------|----------------|----------------|
| $7\frac{1}{2}$                 | 8              | $5\frac{1}{4}$ | $5\frac{3}{4}$ | $6\frac{1}{4}$ | $5\frac{1}{2}$ |
| 5                              | $5\frac{1}{4}$ | $7\frac{1}{4}$ | $6\frac{1}{2}$ | 7              | $6\frac{3}{4}$ |
| $5\frac{1}{2}$                 | $6\frac{1}{4}$ | $5\frac{1}{2}$ | 6              | $5\frac{1}{2}$ | $6\frac{1}{2}$ |
| $7\frac{1}{4}$                 | $6\frac{1}{2}$ | 5              | $5\frac{1}{2}$ | $7\frac{1}{2}$ | 6              |

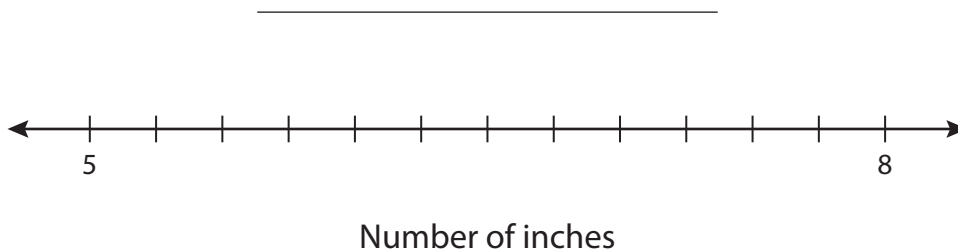
The temperature inside a terrarium for a gecko should be between 78 and 82 degrees.



But at night, the temperature can be a little lower.



- a. Use the table to complete the line plot.



- b. How many geckos did the store owner measure?

- c. What is the difference in the lengths of the longest gecko and the shortest gecko?

- d. How many geckos are shorter than  $6\frac{1}{4}$  inches?

- e. The length of a gecko's tail is about 3 inches. How would the line plot change if the store owner measured the length of each gecko without its tail?