



Perimeter and Area Without Conversions



Purpose This activity has students use all 4 operations to solve problems involving perimeter and area, using only squares and rectangles.

- | | | | |
|--|--|--|---|
| <input type="checkbox"/> One-step | <input checked="" type="checkbox"/> Equation/Number Sentence | <input checked="" type="checkbox"/> Addition | <input checked="" type="checkbox"/> Teacher-facilitated |
| <input checked="" type="checkbox"/> Two-step | <input type="checkbox"/> Verbal Description | <input checked="" type="checkbox"/> Subtraction | <input checked="" type="checkbox"/> Tutoring/Intervention |
| <input checked="" type="checkbox"/> Multi-step | <input checked="" type="checkbox"/> Solution | <input checked="" type="checkbox"/> Multiplication | <input checked="" type="checkbox"/> Centers |
| | <input type="checkbox"/> Estimation | <input checked="" type="checkbox"/> Division | <input type="checkbox"/> Challenge |



How-To Guide

- Put students in groups of 3–4 and hand out materials.
- Project **5.MMT.4 Examples PG. 1**. Use **Sample Discussion #1** on page **29** to lead students through this problem.
- Project **5.MMT.4 Examples PG 2**. Use **Sample Discussion #2** on page **30** to lead students through this problem.
- After the sample discussions, have students perform the following steps to complete the activity:
 - decide whether they are working with area or perimeter;
 - draw a diagram and put the known measures on it;
 - highlight the units to check to see if a conversion is needed;
 - perform conversions as needed;
 - solve the problem;
 - write their answers using units; and
 - check to see if their answers are written in the correct units.



Setting Up For Instruction

- Make 1 copy of **5.MMT.4 Ramp Up** for each student.
- Gather 1 **highlighter** for each student.
- Prepare **5.MMT.4 Examples PG. #1 and #2** to be projected using your classroom technology.
- Make 1 copy of **5.MMT.4 Ramp Up Problems** for each student.



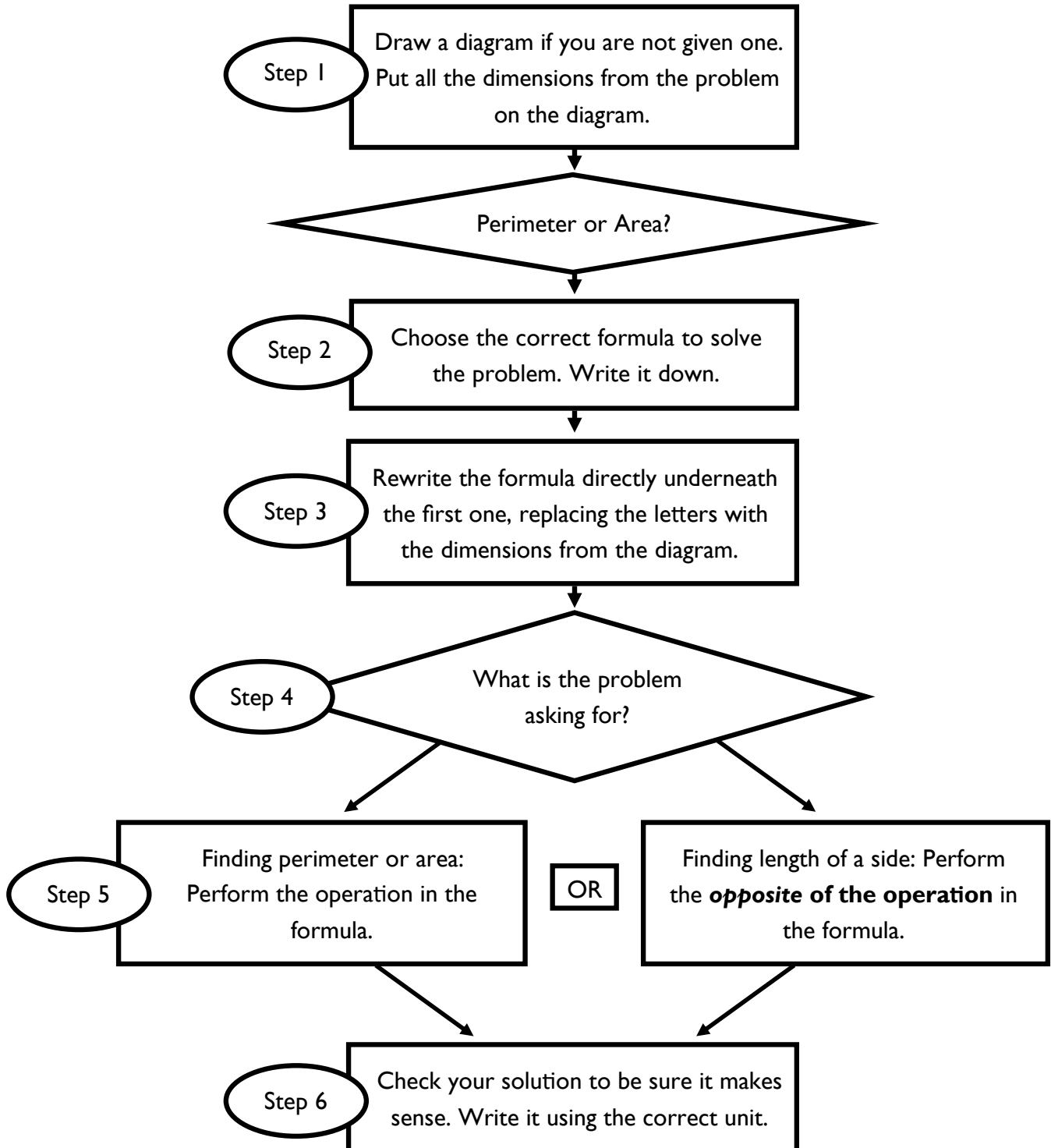
Thought Extenders

- What kind of figure should you draw?
- What measures do you know?
- What is the unit for the solution?
- Does the problem ask you to find perimeter or area? How do you know?
- How do you find perimeter?
- How do you find area?
- What does perimeter mean?
- What does area mean?
- What are the clues that let you know that you must find a missing side length?
- Are you finding perimeter or a missing side length?
- Are you finding area or a missing side length?
- When you find a missing side length, how do you know what operation to choose?
- Did you find the measure that the problem asks you to find?



+ Steps for Solving Problems with a Missing Side (5.1B)

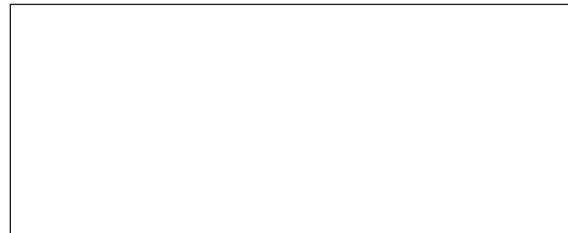
Measurement problems where students have to find the missing side can be complicated for students. Below is an anchor of support that can be used to help students understand the process for solving missing side problems, but doesn't include conversions. This anchor of support is expanded in 5.MMT.11 to include solutions for most measurement problems that involve a formula and conversions.





SAMPLE DISCUSSION #1

- 1 The largest video screen in the world is in Harmony Times Square in Suzhou, China. It measures 500 meters wide, and its perimeter is 1,064 meters. How tall is it?



Perimeter = 1,064 m

500 m

1. Discuss the problem with students. Highlight the dimensions in the problem and other important words—500 meters; perimeter; 1,064 meters; how tall is it?
2. Ask students:
 - What do you have to find? (the height)
 - What does the problem give you? (the width and the perimeter)
 - How do you find the perimeter? ($P = 2l + 2w$)
3. Ask how you can find l . (Student answer will vary.) Sample is below.

$$P = 2l + 2w$$

$$1064 = 2l + (2 \times 500)$$

$$2 \times 500 = 1000$$

$$\begin{array}{r} 1064 \\ -1000 \\ \hline 64 \end{array}$$

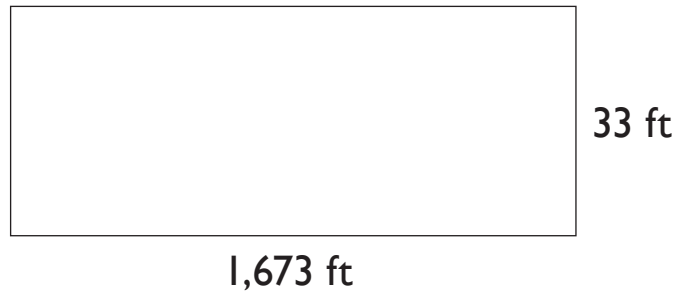
$$2 \overline{)64}$$

The screen is 32 meters tall.



SAMPLE DISCUSSION #2

- 2 The largest video screen in Europe is in the Tauron Arena in Krakow, Poland. It measures 1,673 feet wide by 33 feet tall. What is its perimeter?



1. Discuss the problem with students. Highlight the dimensions in the problem and other important words—1,673 ft wide by 33 ft tall; what is its perimeter?
2. Ask students:
 - What are you looking for? (the perimeter)
 - How do you find the perimeter? ($P = 2l + 2w$)
3. Ask how you can find l .

$$P = 2l + 2w$$

$$P = (2 \times 33) + (2 \times 1673)$$

$$P = 66 + 3346$$

$$P = 3412$$

The perimeter is 3,412 feet.



5.MMT.4 RAMP UP EXAMPLES (PG. 1 OF 2)

- 1 The largest video screen in the world is in Harmony Times Square in Suzhou, China. It measures 500 meters wide, and its perimeter is 1,064 meters. How tall is it?



5.MMT.4 RAMP UP EXAMPLES (PG. 2 OF 2)

- 2 The largest video screen in Europe is in the Tauron Arena in Krakow, Poland. It measures 1,673 feet wide by 33 feet tall. What is its perimeter?



5.MMT.4 RAMP UP PROBLEMS

- | | |
|--|--|
| <p>1 The largest video screen in the world is in Harmony Times Square in Suzhou, China. It measures 500 meters wide, and its perimeter is 1,064 meters. How tall is it?</p> | <p>4 The largest video screen in Texas is at the Texas Motor Speedway in Fort Worth. It measures 218 feet wide by 94.6 feet tall. What is its perimeter?</p> |
| <p>2 The largest video screen in Europe is in the Tauron Arena in Krakow, Poland. It measures 1,673 feet wide by 33 feet tall. What is its perimeter?</p> | <p>5 Two of the largest screens in the world are in AT&T Stadium, where the Dallas Cowboys play. The larger one measures 180 feet wide by 72 feet tall. The smaller one measures 100 feet wide by 38 feet tall. How many square feet more is the area of the larger screen?</p> |
| <p>3 The largest video screen in the USA is at the Fremont Street Experience in Las Vegas, Nevada. It measures 1,500 feet wide by 90 feet tall. What is its area?</p> | <p>6 Two more of the largest screens in the world are at Kyle Field at the Texas A&M University. The larger one 47 feet tall by 163 feet wide. The smaller one is 53 feet tall by 73 feet wide. How many more square feet is the area of the larger screen?</p> |

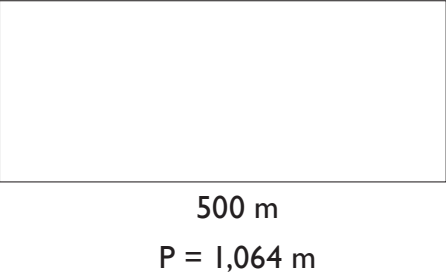





5.MMT.4 RAMP UP ANSWER KEY (PG. 1 OF 3)

Note: In the “Solve it!” space, the solution is sometimes shown using algebra. Your students may work the problem using arithmetic instead.

Directions: Draw a diagram including the dimensions from the problem. Determine if the problem deals with perimeter or area and check the box. Write the formula and fill in the numbers. Then solve the problem. Be sure to include a label on the answer.

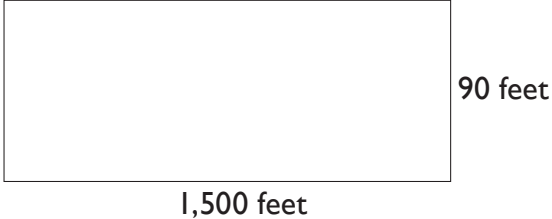
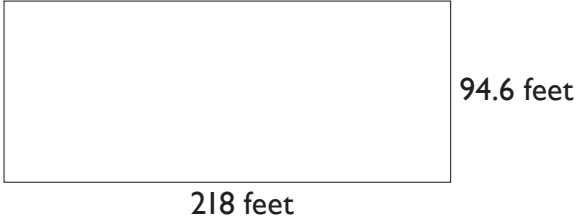
Diagram	Solution
<p>1 <input checked="" type="checkbox"/> Perimeter <input type="checkbox"/> Area</p>  <p style="text-align: center;">500 m P = 1,064 m</p>	<p>Formula: $P = 2l + 2w$</p> <hr/> <p>Fill it in: $1064 = 2(500) + 2w$</p> <hr/> <p style="text-align: center;">Solve it!</p> $1064 = 2(500) + 2w$ $1064 = 1000 + 2w$ $1064 - 1000 = 2w$ $64 = 2w$ $32 = w$ <p>Solution: <u>32 meters</u></p>
<p>2 <input checked="" type="checkbox"/> Perimeter <input type="checkbox"/> Area</p>  <p style="text-align: center;">1,673 feet 33 feet</p>	<p>Formula: $P = 2l + 2w$</p> <hr/> <p>Fill it in: $P = 2(1673) + 2(33)$</p> <hr/> <p style="text-align: center;">Solve it!</p> $P = 2(1673) + 2(33)$ $P = 3346 + 66$ $P = 3412$ <p>Solution: <u>3,412 feet</u></p>



5.MMT.4 RAMP UP ANSWER KEY (PG. 2 OF 3)

Note: In the “Solve it!” space, the solution is sometimes shown using algebra. Your students may work the problem using arithmetic instead.

Directions: Draw a diagram including the dimensions from the problem. Determine if the problem deals with perimeter or area and check the box. Write the formula and fill in the numbers. Then solve the problem. Be sure to include a label on the answer.

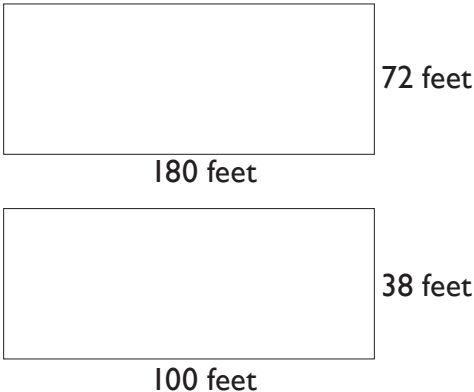
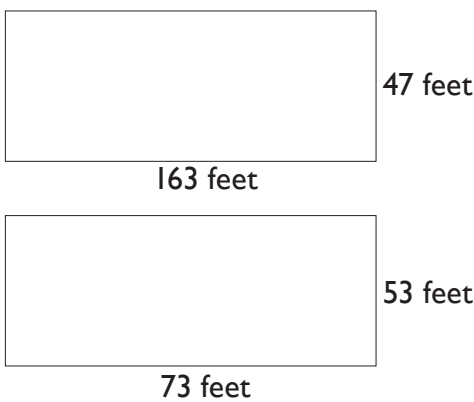
Diagram	Solution
<p>3 <input type="checkbox"/> Perimeter <input checked="" type="checkbox"/> Area</p>  <p>A rectangle with a length of 1,500 feet and a width of 90 feet.</p>	<p>Formula: $A = l \times w$</p> <p>Fill it in: $A = 1500 \times 90$</p> <p>Solve it!</p> <p>$A = 1500 \times 90$ $A = 135,000$</p> <p>Solution: 135,000 square feet</p>
<p>4 <input checked="" type="checkbox"/> Perimeter <input type="checkbox"/> Area</p>  <p>A rectangle with a length of 218 feet and a width of 94.6 feet.</p>	<p>Formula: $P = 2l + 2w$</p> <p>Fill it in: $P = 2(218) + 2(94.6)$</p> <p>Solve it!</p> <p>$P = 2(218) + 2(94.6)$ $P = 436 + 189.2$ $P = 625.2$</p> <p>Solution: 625.2 feet</p>



5.MMT.4 RAMP UP ANSWER KEY (PG. 3 OF 3)

Note: In the “Solve it!” space, the solution is sometimes shown using algebra. Your students may work the problem using arithmetic instead.

Directions: Draw a diagram including the dimensions from the problem. Determine if the problem deals with perimeter or area and check the box. Write the formula and fill in the numbers. Then solve the problem. Be sure to include a label on the answer.

Diagram	Solution
<p>5 <input type="checkbox"/> Perimeter <input checked="" type="checkbox"/> Area</p> 	<p>Formula: $A = l \times w$</p> <p>Fill it in: $A = 180 \times 72$ $A = 100 \times 38$</p> <p style="text-align: center;">Solve it!</p> $A = 180 \times 72 \qquad A = 100 \times 38$ $A = 12960 \qquad A = 3800$ $A = 12960 - 3800$ $A = 9160$ <p>Solution: <u>9,160 square feet</u></p>
<p>6 <input type="checkbox"/> Perimeter <input checked="" type="checkbox"/> Area</p> 	<p>Formula: $A = l \times w$</p> <p>Fill it in: $A = 163 \times 47$ $A = 73 \times 53$</p> <p style="text-align: center;">Solve it!</p> $A = 163 \times 47 \qquad A = 73 \times 53$ $A = 7661 \qquad A = 3869$ $A = 7661 - 3869$ $A = 3792$ <p>Solution: <u>3,792 square feet</u></p>



5.MMT.4 RAMP UP (PG. 1 OF 3)

Name: _____

Directions: Draw a diagram including the dimensions from the problem. Determine if the problem deals with perimeter or area and check the box. Write the formula and fill in the numbers. Then solve the problem. Be sure to include a label on the answer.

Diagram	Solution
<p>1 <input type="checkbox"/> Perimeter <input type="checkbox"/> Area</p>	<p>Formula: _____</p> <p>Fill it in: _____</p> <p style="text-align: center;">Solve it!</p> <p>Solution: _____</p>
<p>2 <input type="checkbox"/> Perimeter <input type="checkbox"/> Area</p>	<p>Formula: _____</p> <p>Fill it in: _____</p> <p style="text-align: center;">Solve it!</p> <p>Solution: _____</p>





5.MMT.4 RAMP UP (PG. 2 OF 3)

Name: _____

Directions: Draw a diagram including the dimensions from the problem. Determine if the problem deals with perimeter or area and check the box. Write the formula and fill in the numbers. Then solve the problem. Be sure to include a label on the answer.

Diagram	Solution
<p>3 <input type="checkbox"/> Perimeter <input type="checkbox"/> Area</p>	<p>Formula: _____</p> <p>Fill it in: _____</p> <p style="text-align: center;">Solve it!</p> <p>Solution: _____</p>
<p>4 <input type="checkbox"/> Perimeter <input type="checkbox"/> Area</p>	<p>Formula: _____</p> <p>Fill it in: _____</p> <p style="text-align: center;">Solve it!</p> <p>Solution: _____</p>





Directions: Draw a diagram including the dimensions from the problem. Determine if the problem deals with perimeter or area and check the box. Write the formula and fill in the numbers. Then solve the problem. Be sure to include a label on the answer.

Diagram	Solution
<p>5 <input type="checkbox"/> Perimeter <input type="checkbox"/> Area</p>	<p>Formula: _____</p> <p>Fill it in: _____</p> <p style="text-align: center;">Solve it!</p> <p>Solution: _____</p>
<p>6 <input type="checkbox"/> Perimeter <input type="checkbox"/> Area</p>	<p>Formula: _____</p> <p>Fill it in: _____</p> <p style="text-align: center;">Solve it!</p> <p>Solution: _____</p>