Eureka Math

4th Grade
Module 3
Lesson 2

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Directions for customizing presentations are available on the next slide.

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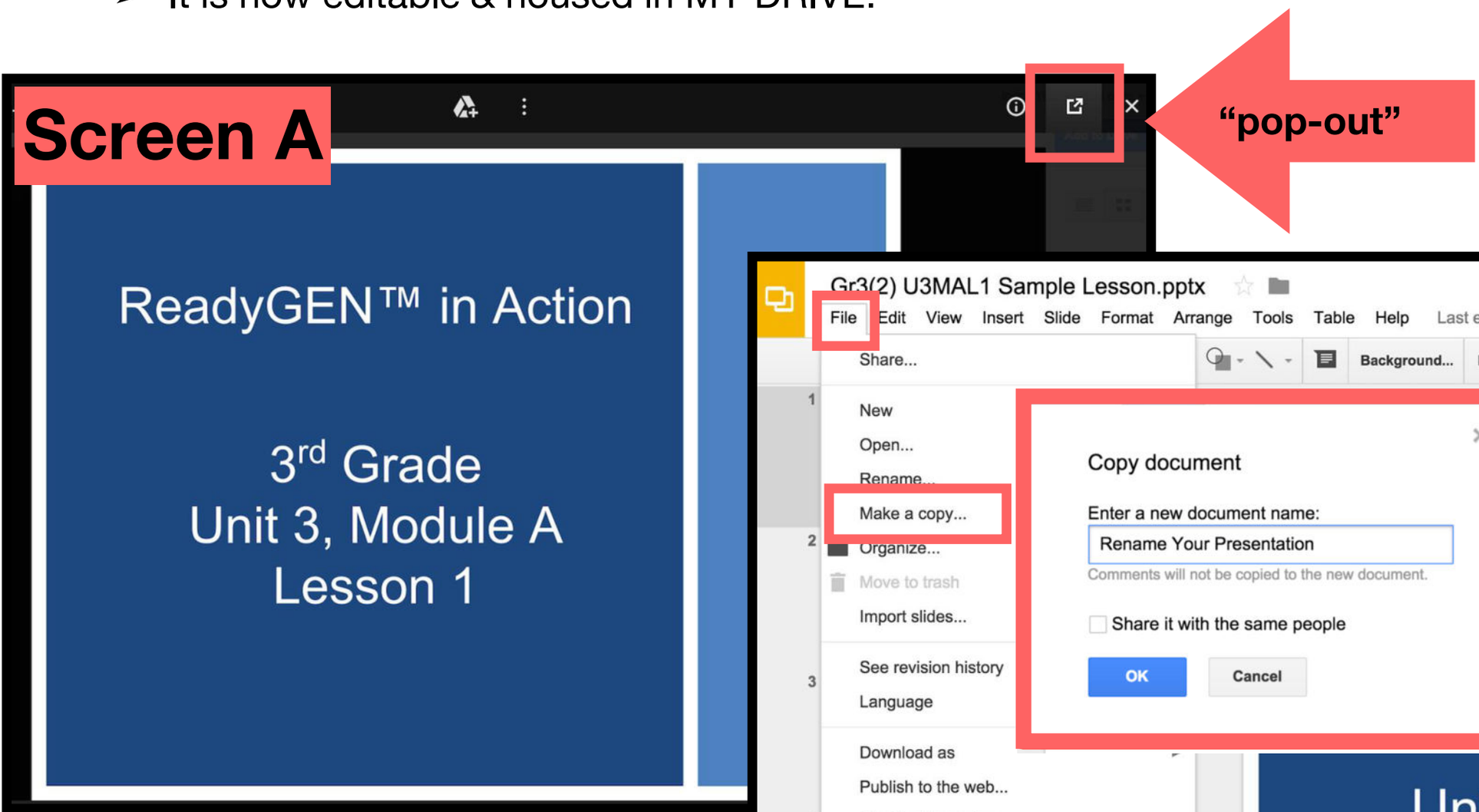
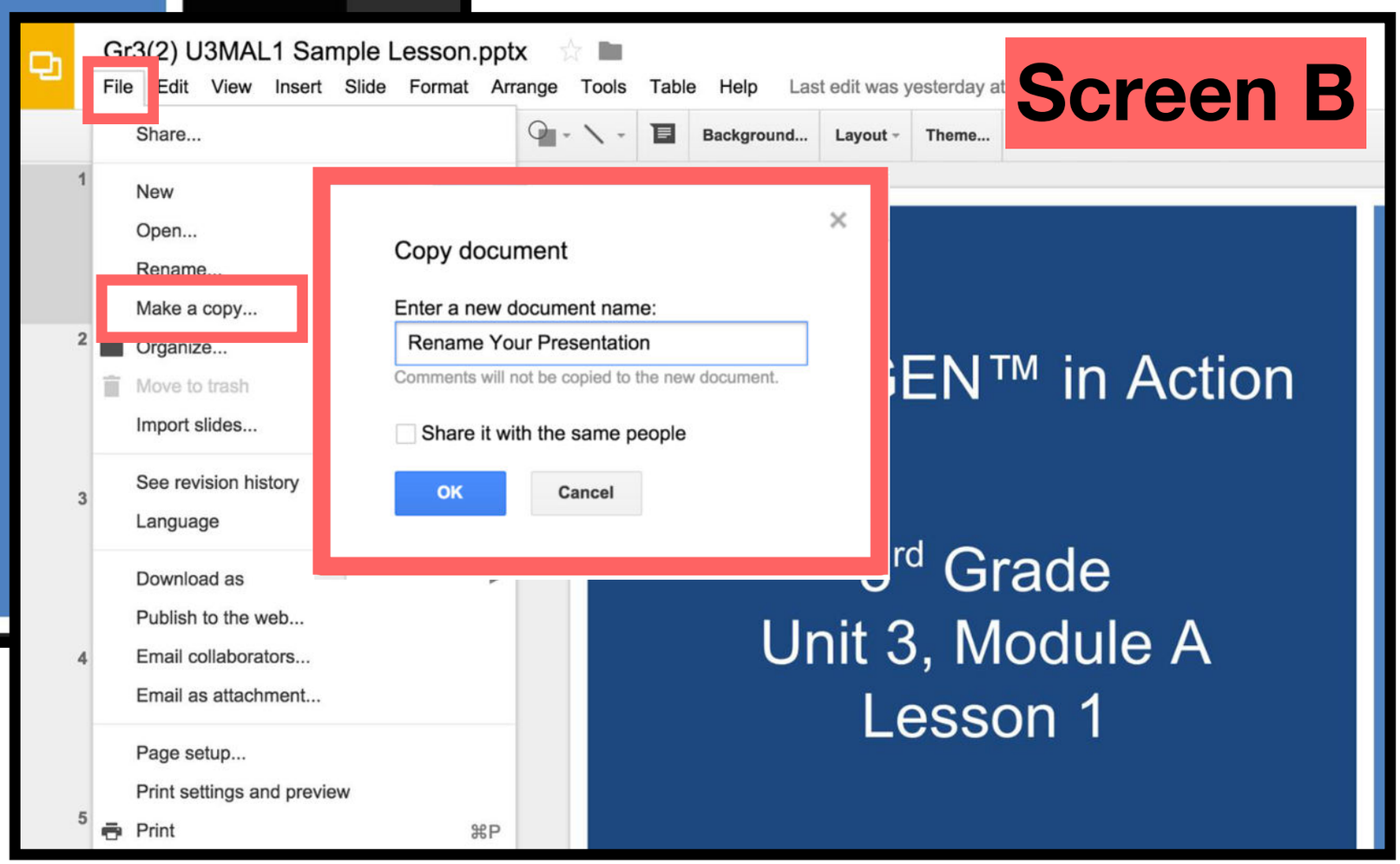




Icons

Read, Draw, Write

Learning Target

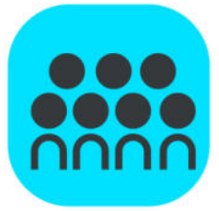
Personal White Board

Problem Set

Manipulatives Needed

Fluency

Think Pair Share



Whole Class

Individual

Partner

Small Group

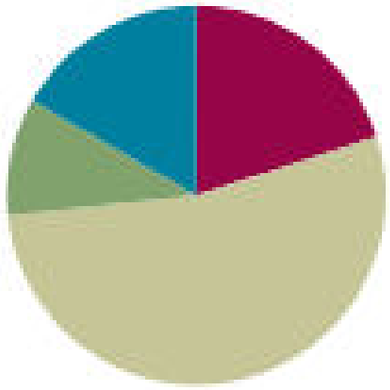
Small Group Time

Lesson 2

Objective: Solve multiplicative comparison word problems by applying the area and perimeter formulas.

Suggested Lesson Structure

Fluency Practice	(12 minutes)
Application Problem	(6 minutes)
Concept Development	(32 minutes)
Student Debrief	(10 minutes)
Total Time	**(60 minutes)**



I can solve multiplicative comparison word problems by applying the area and perimeter formulas.

Fluency Practice

Multiply a Number by Itself

Multiply a Number by Itself:

1 x 1 = _____

Say the complete multiplication equation.

Fluency Practice

Multiply a Number by Itself

Multiply a Number by Itself:

2 x 2 = _____

Say the complete multiplication equation.

Fluency Practice

Multiply a Number by Itself

Now, I'm going to call out a number. You say the answer when it's multiplied by itself.

Fluency Practice

Multiply a Number by Itself

Now, I'm going to call out a number. You say the answer when it's multiplied by itself.

10

Fluency Practice

Multiply a Number by Itself

Now, I'm going to call out a number. You say the answer when it's multiplied by itself.

5

Fluency Practice

Multiply a Number by Itself

Now, I'm going to call out a number. You say the answer when it's multiplied by itself.

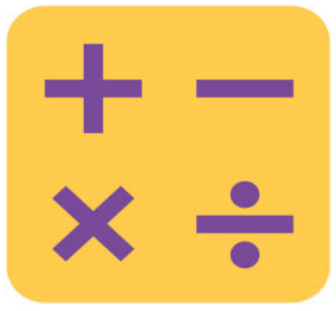
3

Fluency Practice

Multiply a Number by Itself

Now, I'm going to call out a number. You say the answer when it's multiplied by itself.

6

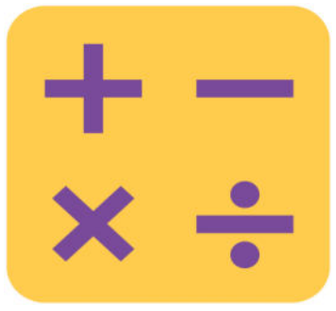


Fluency Practice

Multiply a Number by Itself

Now, I'm going to call out a number. You say the answer when it's multiplied by itself.

8

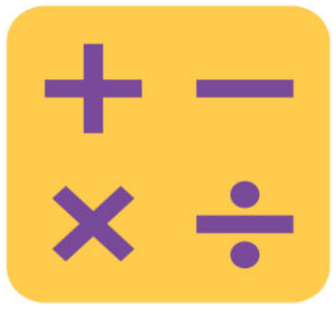


Fluency Practice

Multiply a Number by Itself

Now, I'm going to call out a number. You say the answer when it's multiplied by itself.

4

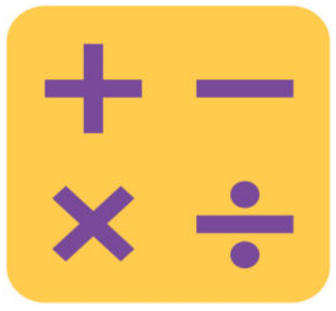


Fluency Practice

Multiply a Number by Itself

Now, I'm going to call out a number. You say the answer when it's multiplied by itself.

7



Fluency Practice

Multiply a Number by Itself

Now, I'm going to call out a number. You say the answer when it's multiplied by itself.

9

Fluency Practice

Rename the Unit

7 tens = _____

Fluency Practice

Rename the Unit

7 tens = 70

Fluency Practice

Rename the Unit

9 tens = _____

Fluency Practice

Rename the Unit

9 tens = 90

Fluency Practice

Rename the Unit

10 tens = _____

Fluency Practice

Rename the Unit

10 tens = 100

Fluency Practice

Rename the Unit

11 tens = _____

Fluency Practice

Rename the Unit

11 tens = 110

Fluency Practice

Rename the Unit

12 tens = _____

Fluency Practice

Rename the Unit

12 tens = 120

Fluency Practice

Rename the Unit

17 tens = _____

Fluency Practice

Rename the Unit

17 tens = 170

Fluency Practice

Rename the Unit

17 hundreds = _____

Fluency Practice

Rename the Unit

17 hundreds = 1,700

Fluency Practice

Rename the Unit

17 thousands = _____

Fluency Practice

Rename the Unit

17 thousands = 17,000

Fluency Practice

Rename the Unit

13 tens = _____

Fluency Practice

Rename the Unit

13 tens = 130

Fluency Practice

Rename the Unit

13 hundreds = _____

Fluency Practice

Rename the Unit

13 hundreds = 1,300

Fluency Practice

Rename the Unit

13 thousands = _____

Fluency Practice

Rename the Unit

13 thousands = 13,000

Fluency Practice

Find the Area and Perimeter

On your personal white board, write a multiplication sentence to find the area.

4

cm

Fluency Practice

Find the Area and Perimeter

Use the formula for perimeter to solve.

4

cm

Fluency Practice

Find the Area and Perimeter

On your personal white board, write a multiplication sentence to find the area.

Fluency Practice

Find the Area and Perimeter

Use the formula for perimeter to solve.

6

cm

Fluency Practice

Find the Area and Perimeter

This is a square.
Say the length of each side

Fluency Practice

Find the Area and Perimeter

On your personal white board, write a multiplication sentence to find the area.

Fluency Practice

Find the Area and Perimeter

Use the formula for perimeter to solve.

Fluency Practice

Find the Area and Perimeter

This is a square.
Say the length of each side

Fluency Practice

Find the Area and Perimeter

On your personal white board, write a multiplication sentence to find the area.

Fluency Practice

Find the Area and Perimeter

Use the formula for perimeter to solve.

Fluency Practice

Find the Area and Perimeter

The area is 12 square cm.
On your white boards, write the division equation to find the width.

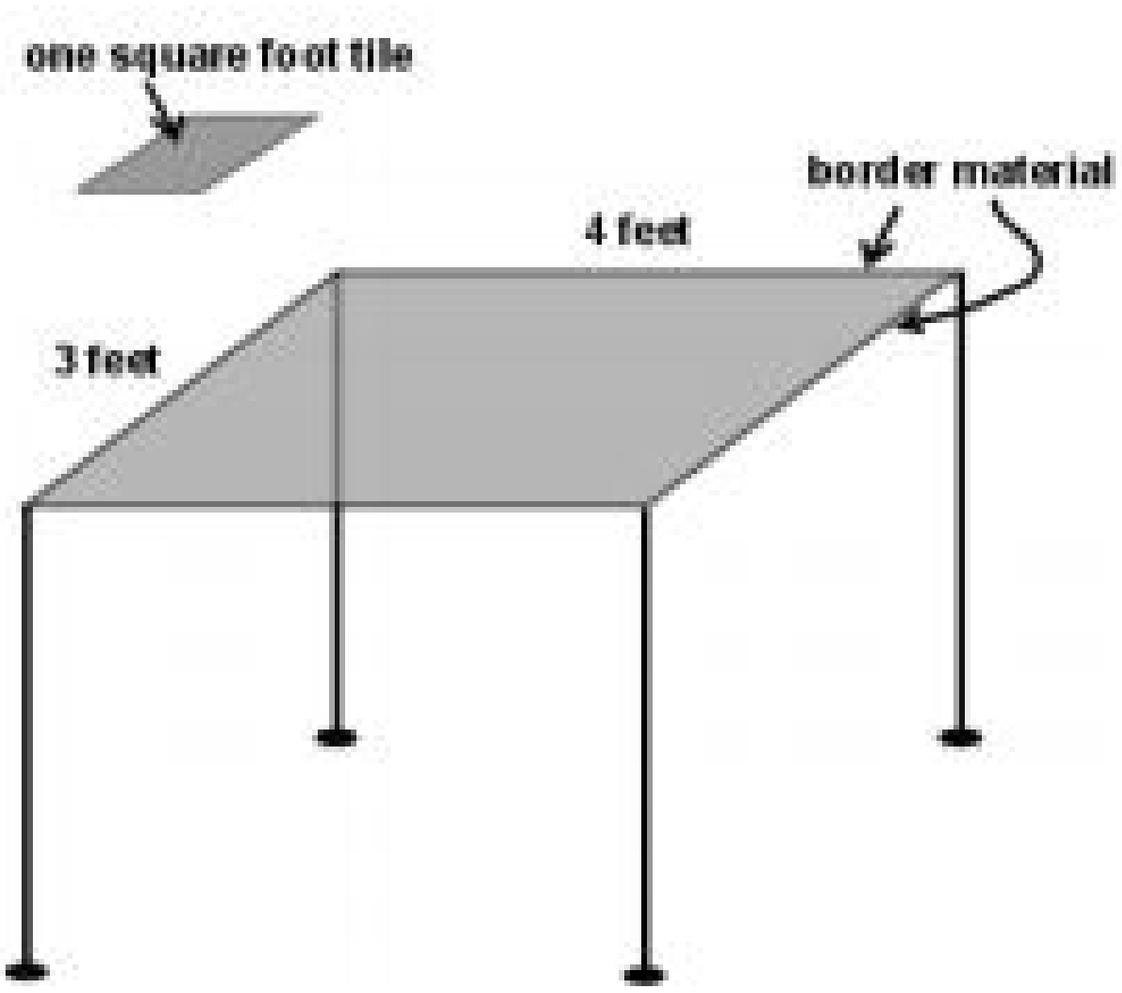
Fluency Practice

Find the Area and Perimeter

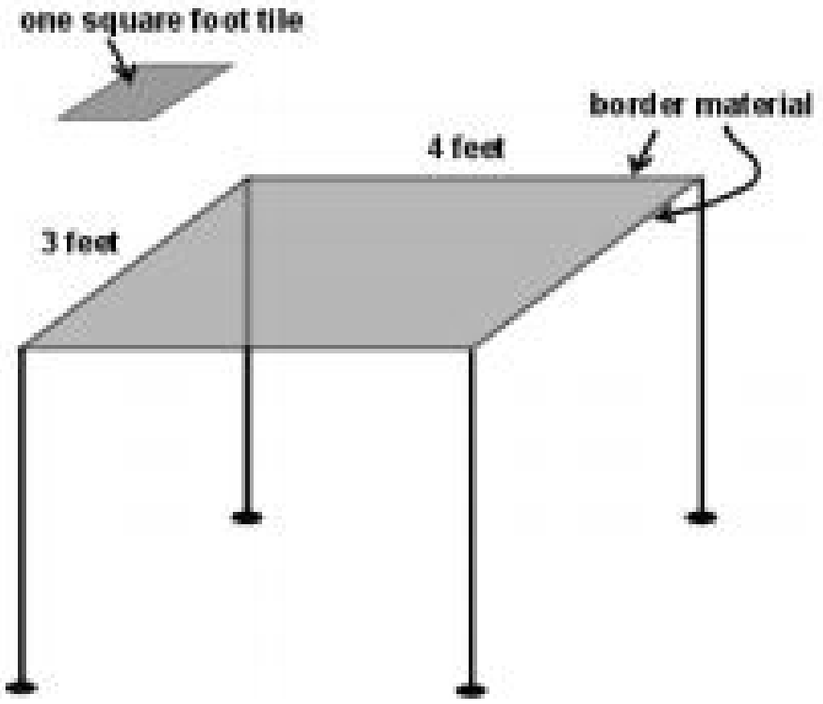
The area is 25 square cm.
Write the division equation to find the width.

Application Problems

Tommy's dad is teaching him how to make tables out of tiles. Tommy makes a small table that is 3 feet wide and 4 feet long.



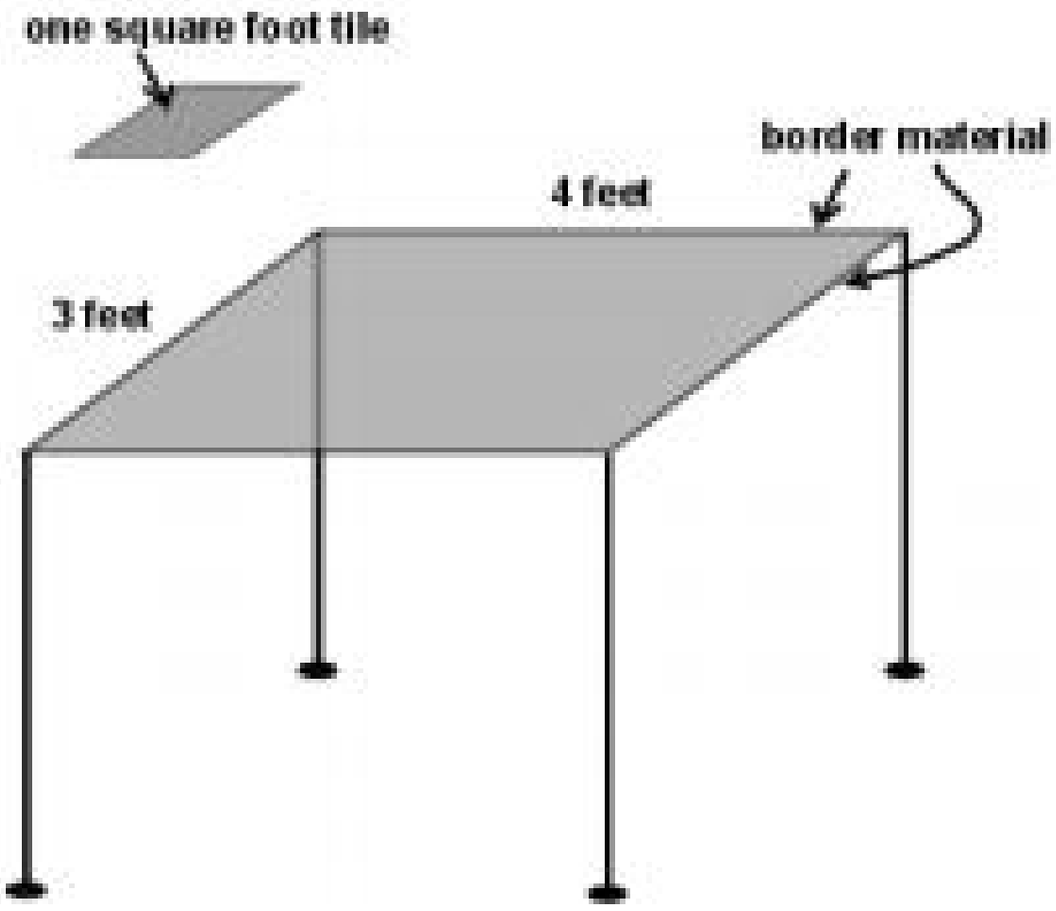
Application Problems



How many square-foot tiles does he need to cover the top of the table?

How many feet of decorative border material will his dad need to cover the edges of the table?

Application Problems



Tommy's dad is making a table 6 feet wide and 8 feet long. When both tables are placed together, what will their combined area be?

Concept Development

Materials

Teacher: Chart of formulas for perimeter and area from Lesson 1.

Students: Personal white boards, square-inch tiles

Concept Development

A rectangle is 1 inch wide. It is 3 times as long as it is wide. Use square tiles to find its length.

Place 3 square-inch tiles on your personal white board. Talk to your partner about what the width and length of this rectangle are.

Concept Development

Now let's make it 2 times as long.
It's now 6 inches long.

Concept Development

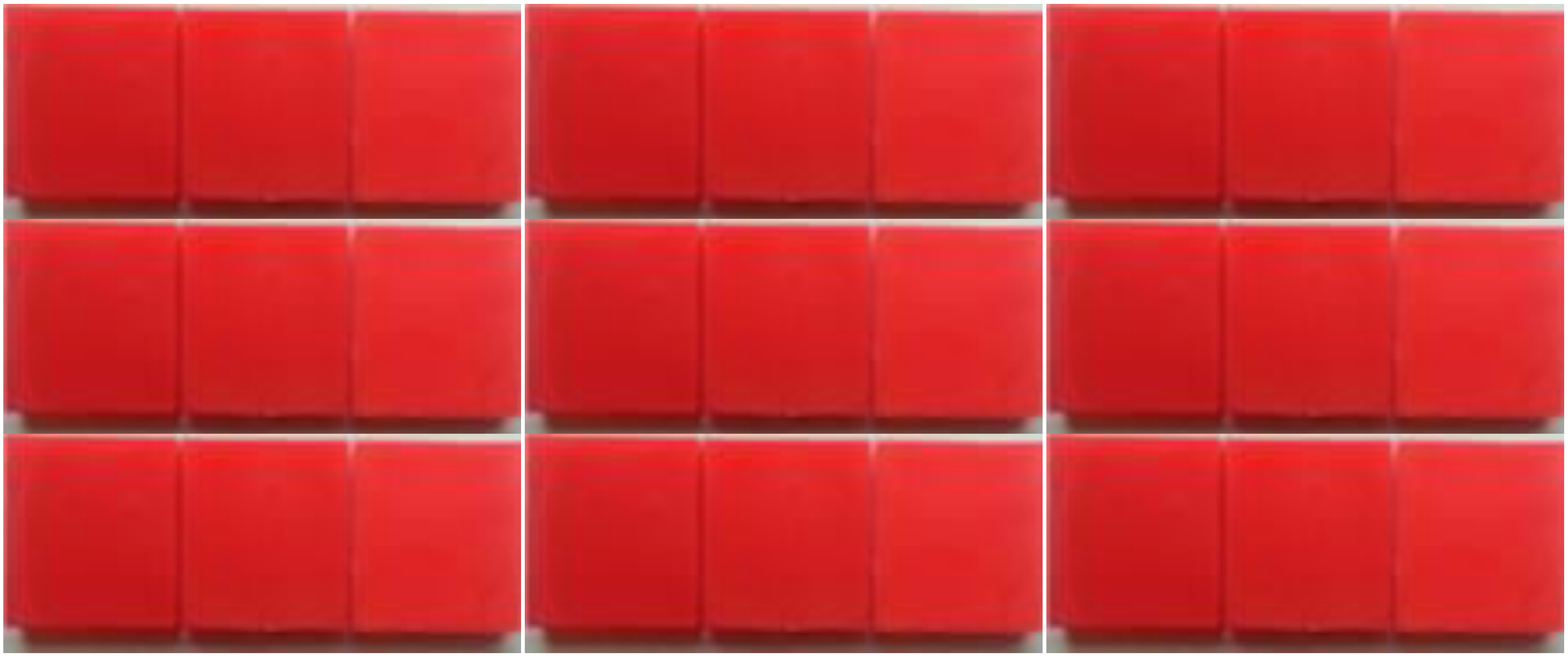
Three times as long would be 9 inches.
Using the original length of 3 inches, tell your partner how to determine the current length that is three times as many.

Concept Development

Find a rectangle that is 3 times as wide as the rectangle shown below.

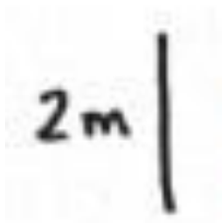
Concept Development

Find a rectangle that is 3 times as wide as the rectangle shown below.



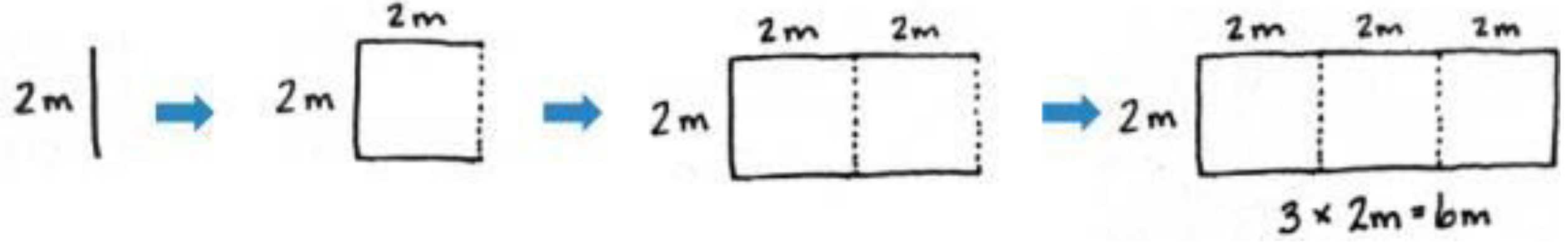
Concept Development

A rectangle is 2 meters wide.



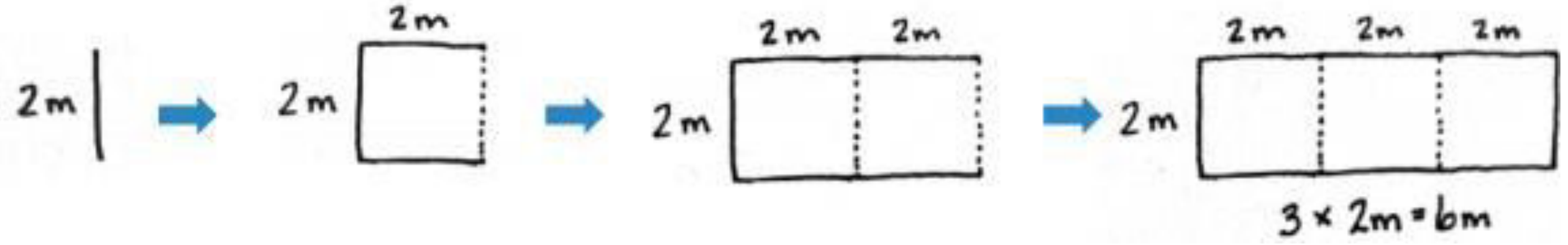
Concept Development

It is 3 times as long as it is wide. That means the length can be thought can be thought of as three segments, or short lines, each 2 meters long.



Concept Development

What is the length when there are 3 segments, each 2 meters long?

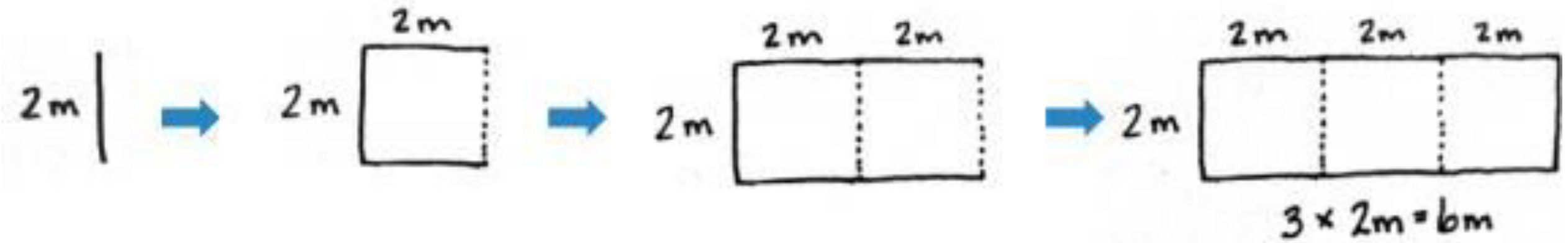


Concept Development

With your partner, draw this rectangle and label the length and width.

What is the length?

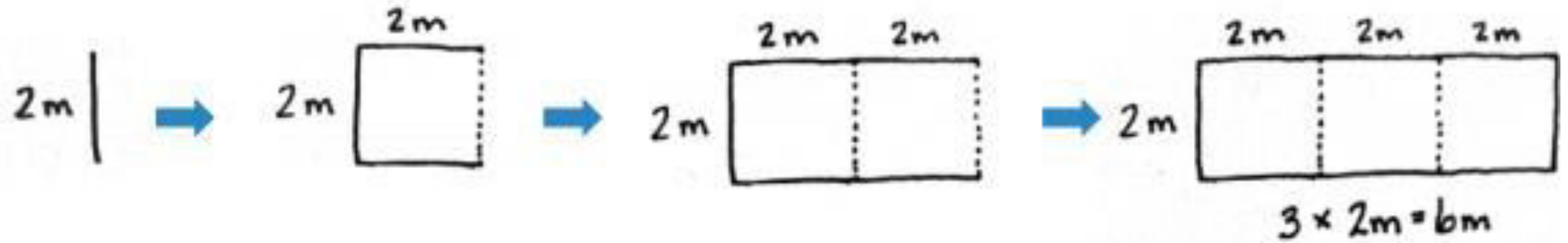
What is the width?



Concept Development

What is the perimeter?

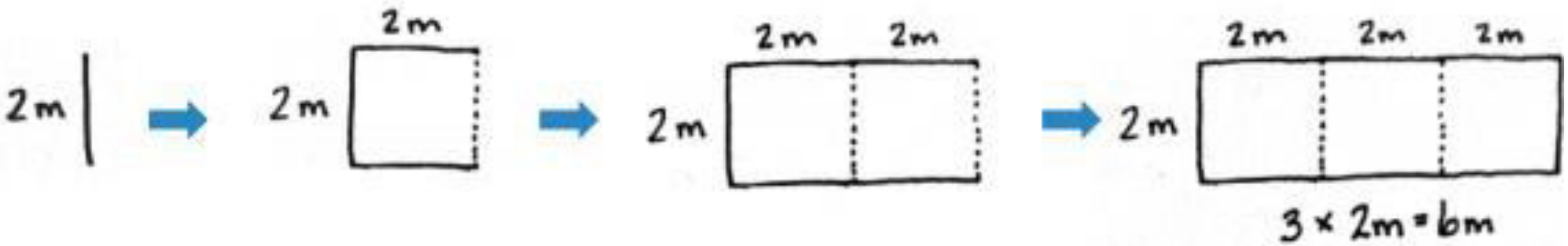
Use the chart of formulas for perimeters from Lesson 1 for reference.



Concept Development

What is the area?

Use the chart of formulas for perimeters from Lesson 1 for reference.



Concept Development

Christine painted a mural with an area of 18 square meters and a length of 6 meters. What is the width or her mural?

Her next mural will be the same length as the first but 4 times as wide.

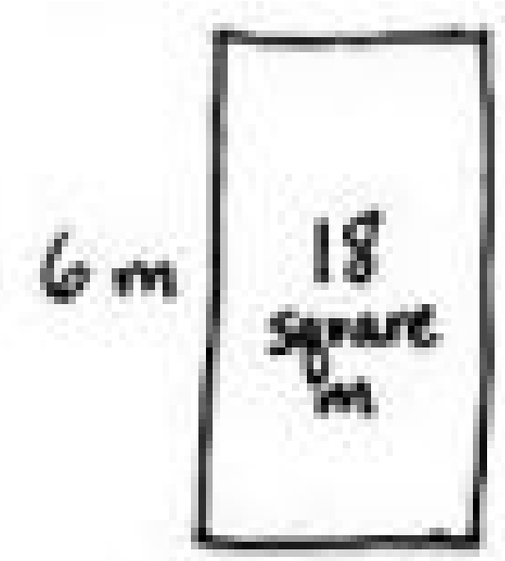
What is the perimeter of her next mural?

Concept Development

With your partner, determine the width of the first mural.

Concept Development

With your partner, determine the width of the first mural.



$A = L \times W$ or $A \div L = W$

$18 \div 6 = 3$

The width of her mural is 3 meters.

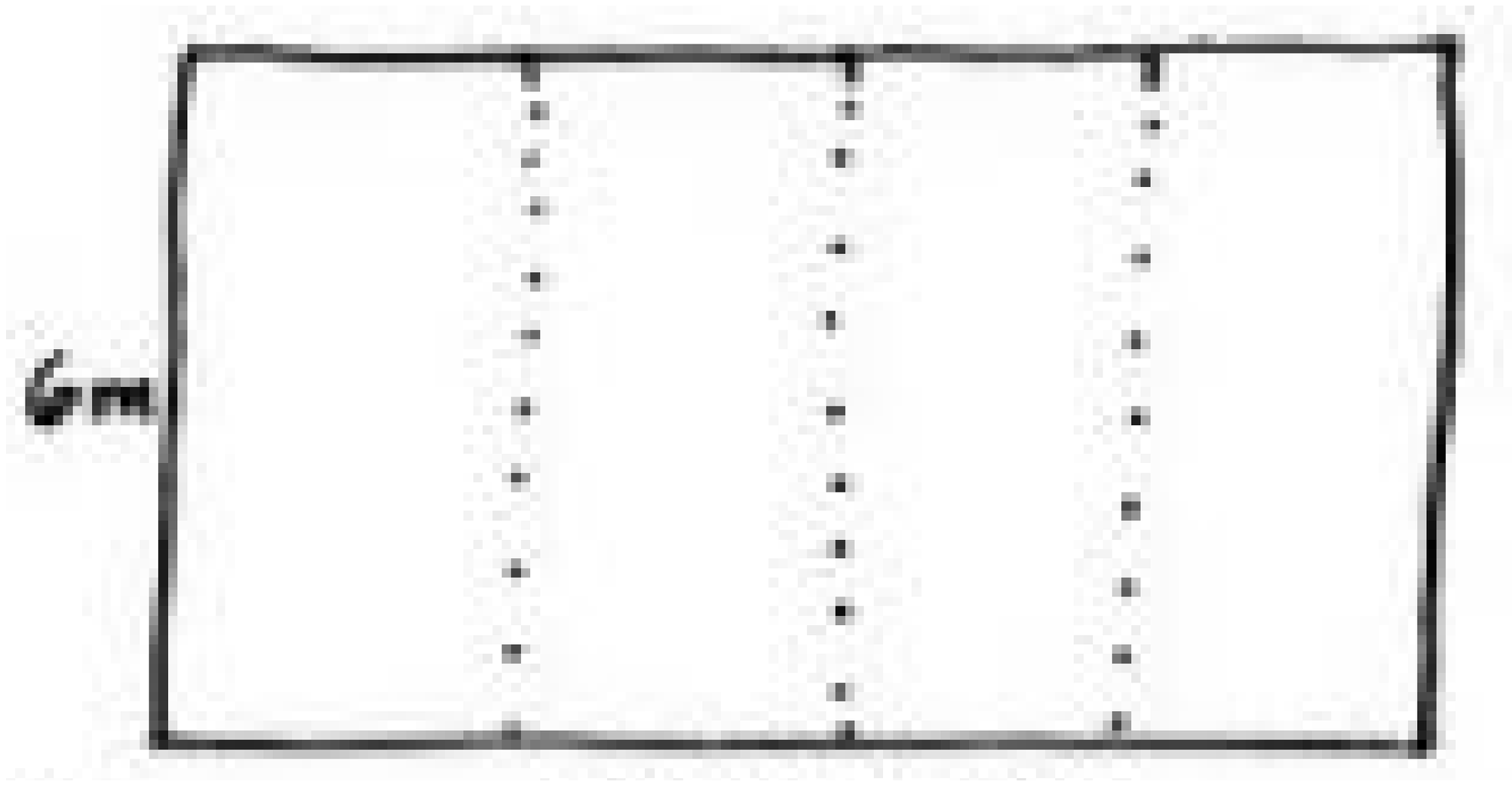
Concept Development

Using the dimensions found, draw and label Christine's next mural. Begin with the side length you know, 6 meters.

How many copies of Christine's first mural will we see in her next mural?

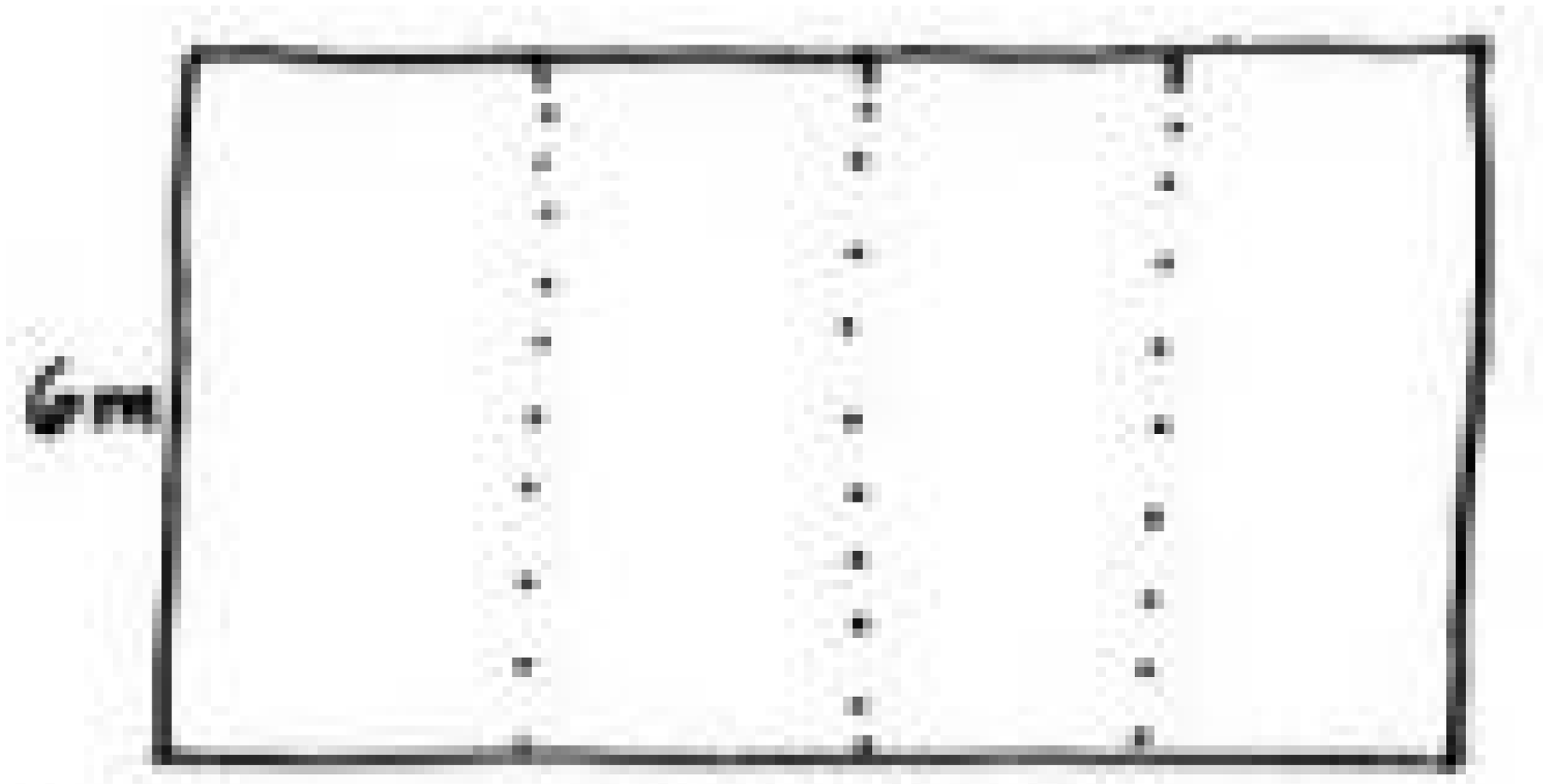
Draw them.

Concept Development



Tell me a multiplication sentence to find how wide her next mural will be.

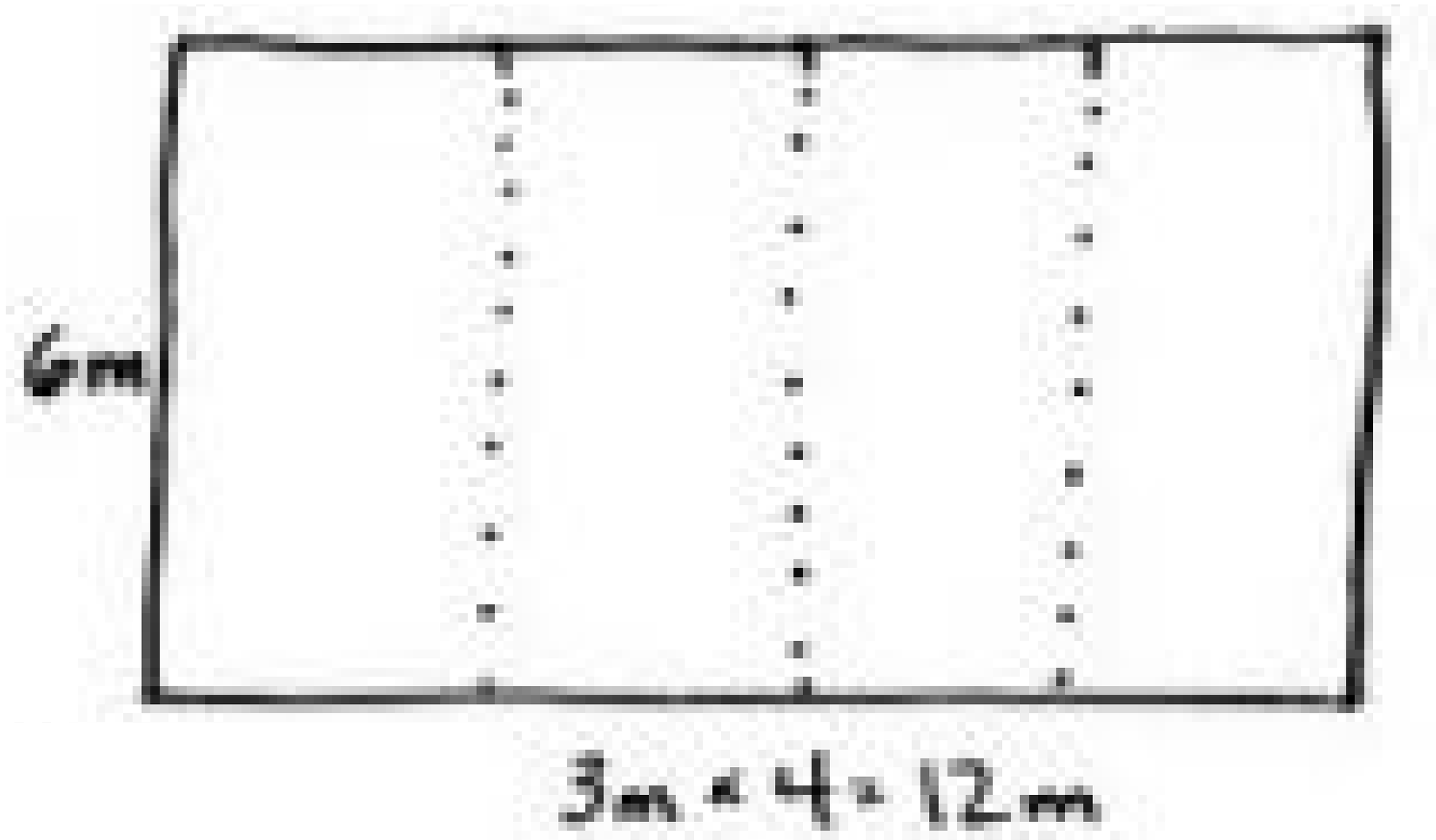
Concept Development



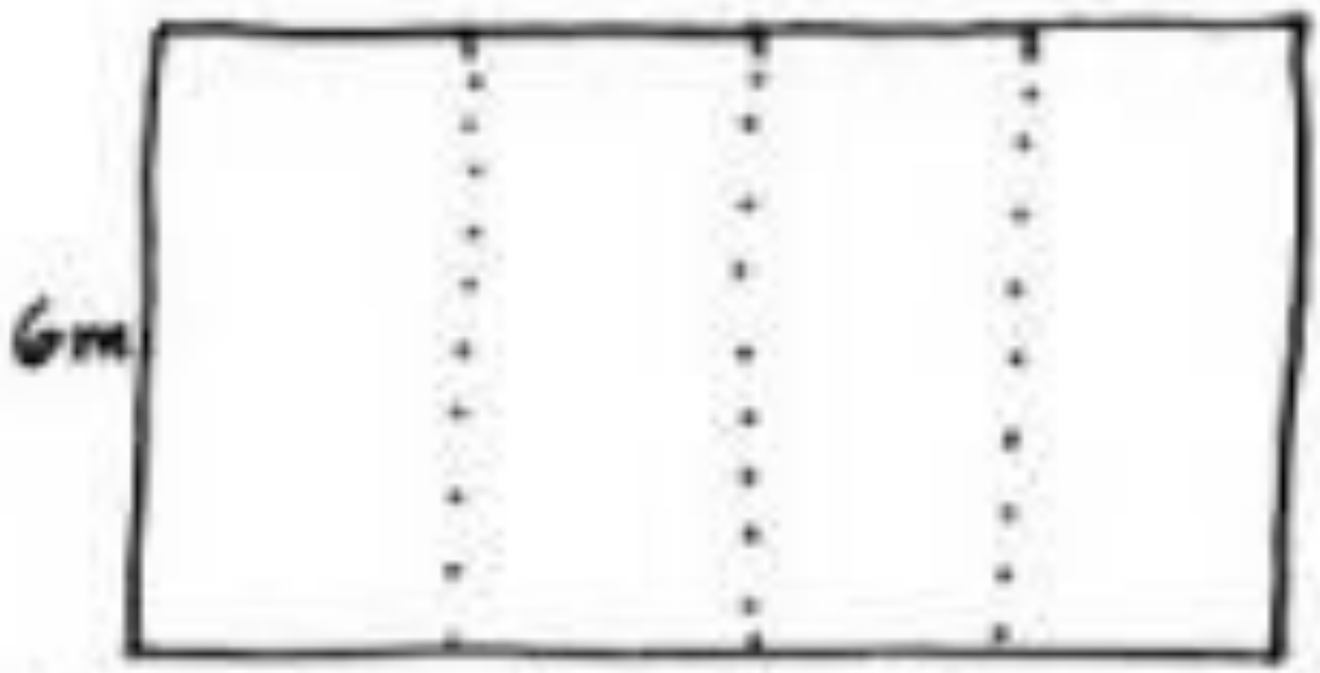
Put on labels

Concept Development

Find the perimeter of Christine's next mural.



Concept Development



3m × 4 = 12m

P = 2 × (l + w)

2 × (6 + 12)

2 × (18) = 36 meters

The perimeter of her next mural is 36 meters.

Concept Development

Sherrie's rectangular garden is 8 square meters. The longer side of the garden is 4 meters.

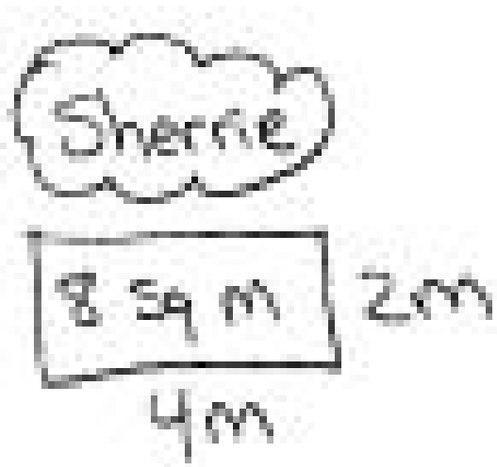
Nancy's garden is twice as long and twice as wide as Sherrie's rectangular garden.

Concept Development

With your partner,
draw and label
a diagram of Sherri's garden.

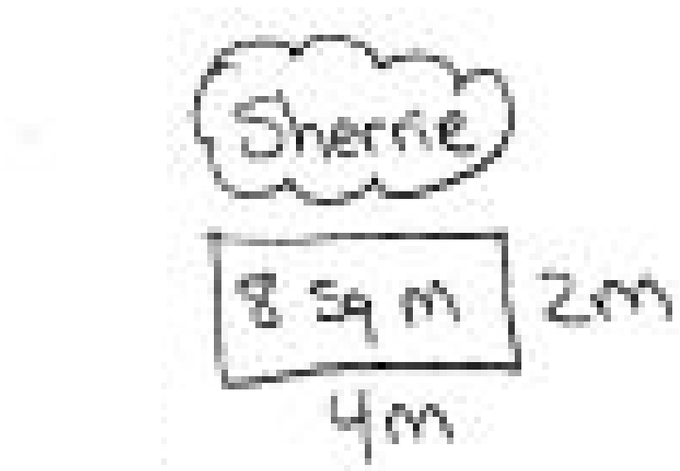
Concept Development

With your partner,
draw and label
a diagram of Sherri's garden.



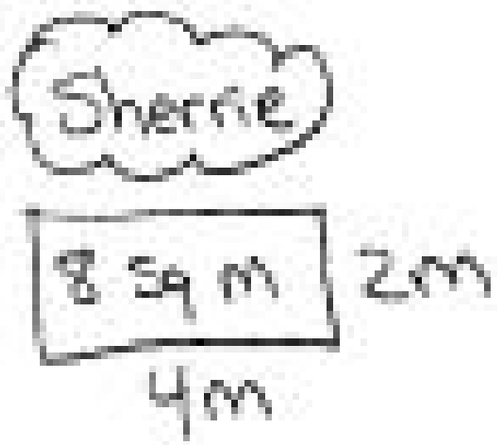
Concept Development

What is the width of Sherrie's garden?



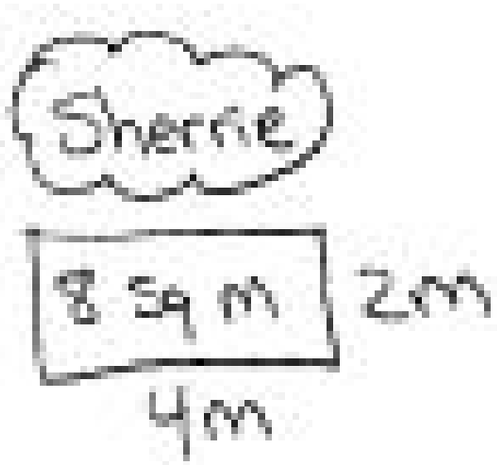
Concept Development

Help me draw Nancy's garden. Twice as long as 4 meters is how many meters?



Concept Development

Draw Nancy's garden and find the perimeters of both gardens.



Concept Development

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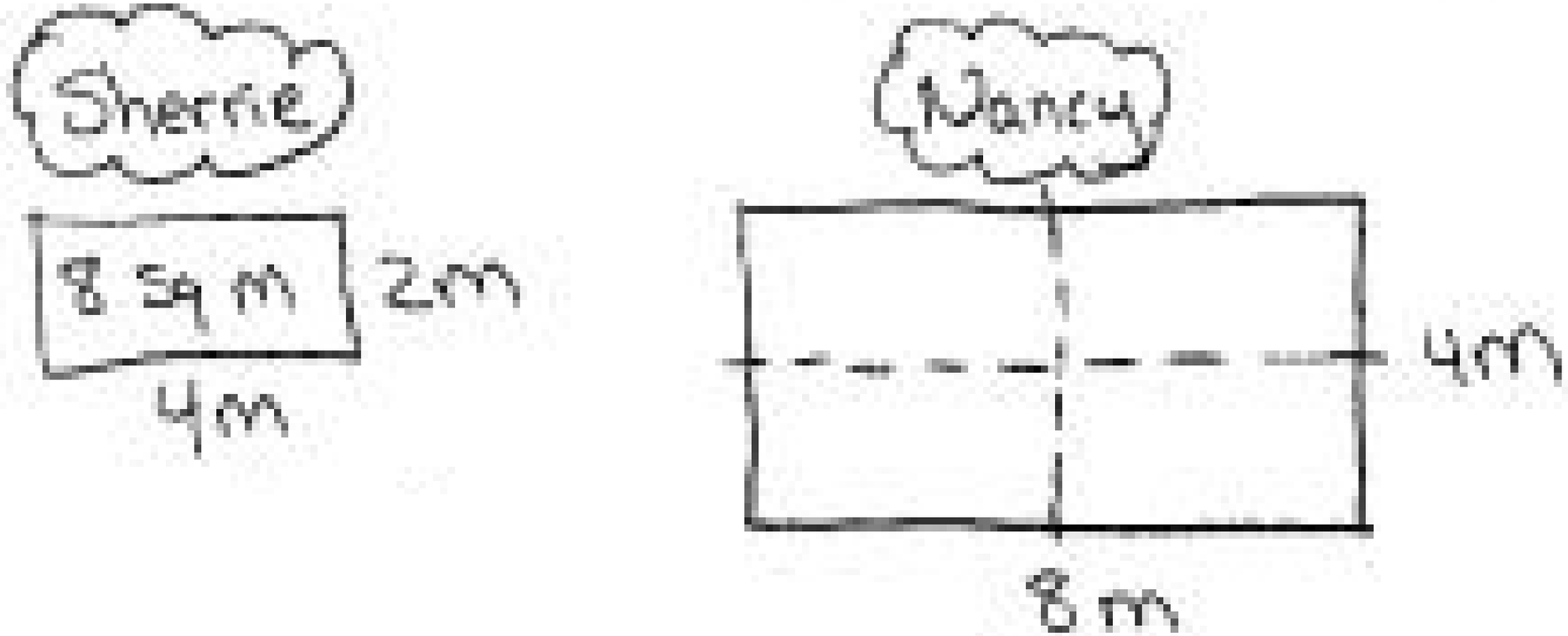
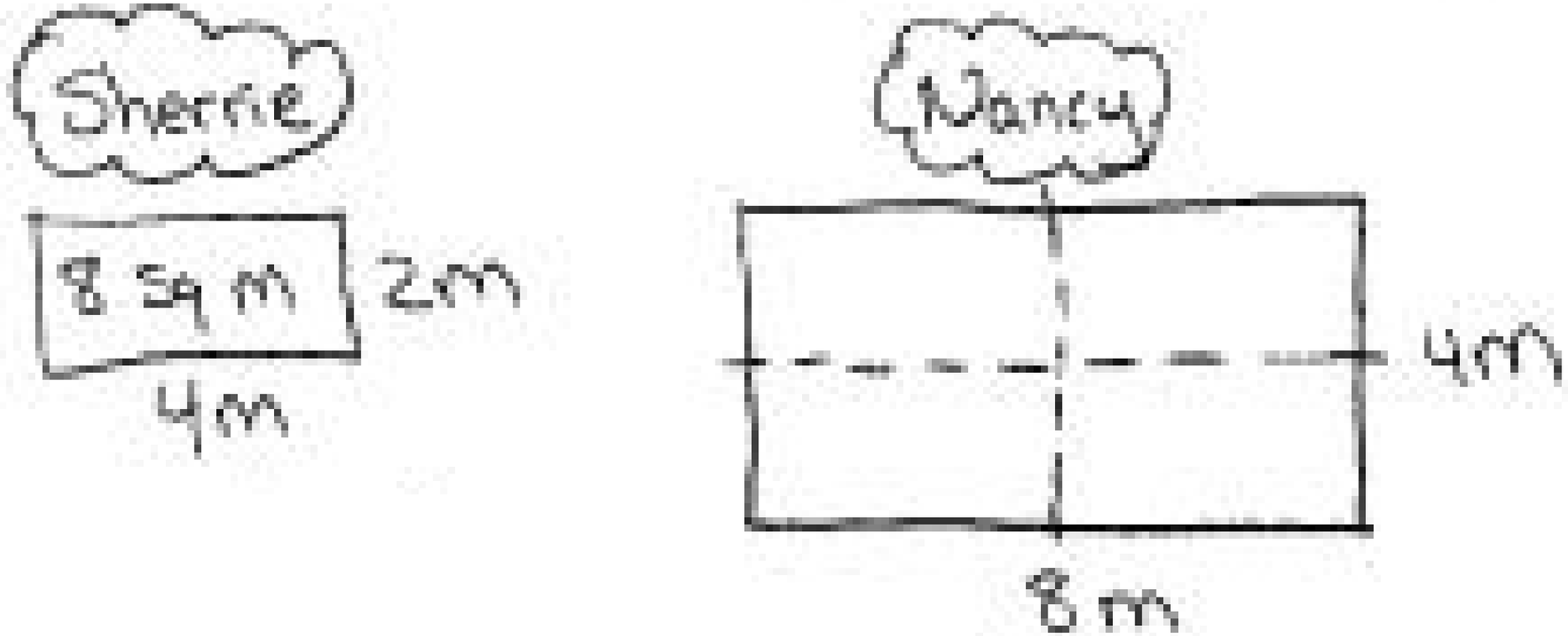


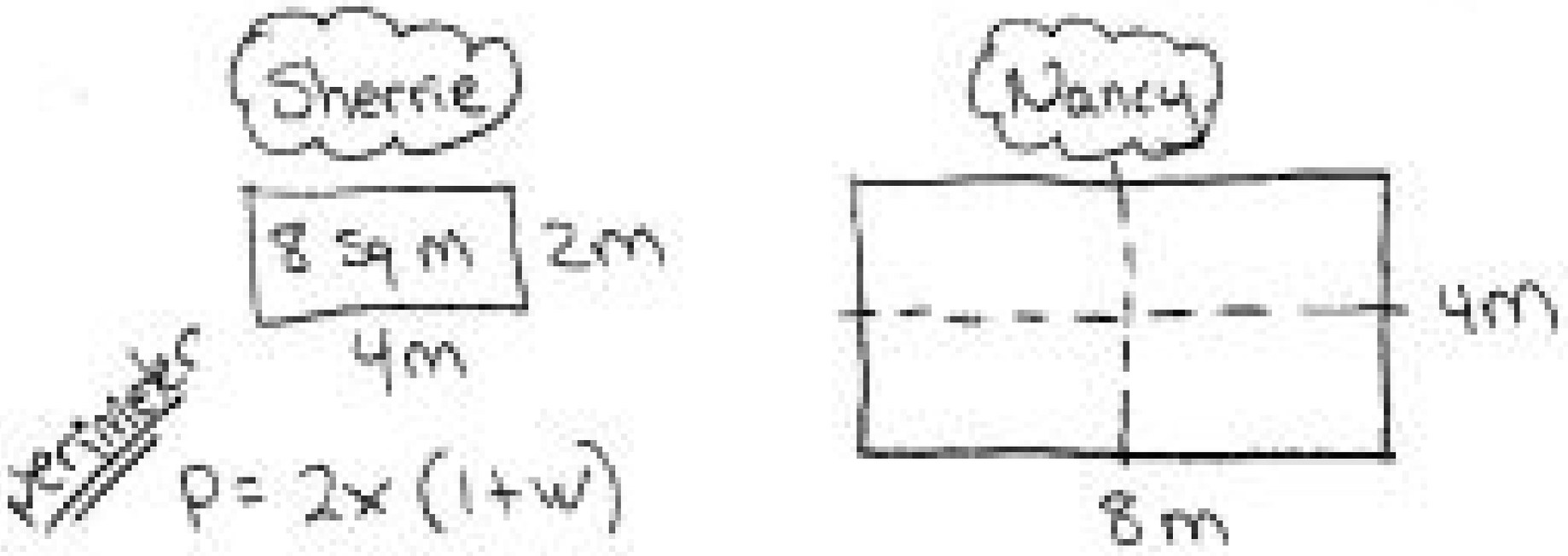
Concept Development

Draw Nancy's garden and find the perimeters of both gardens.



Concept Development

Tell your partner the relationship between the two perimeters.



Sherrie

$P = 2 \times (l + w)$

$= 2 \times 6\text{ m}$

$= 12 \text{ meters}$

Nancy

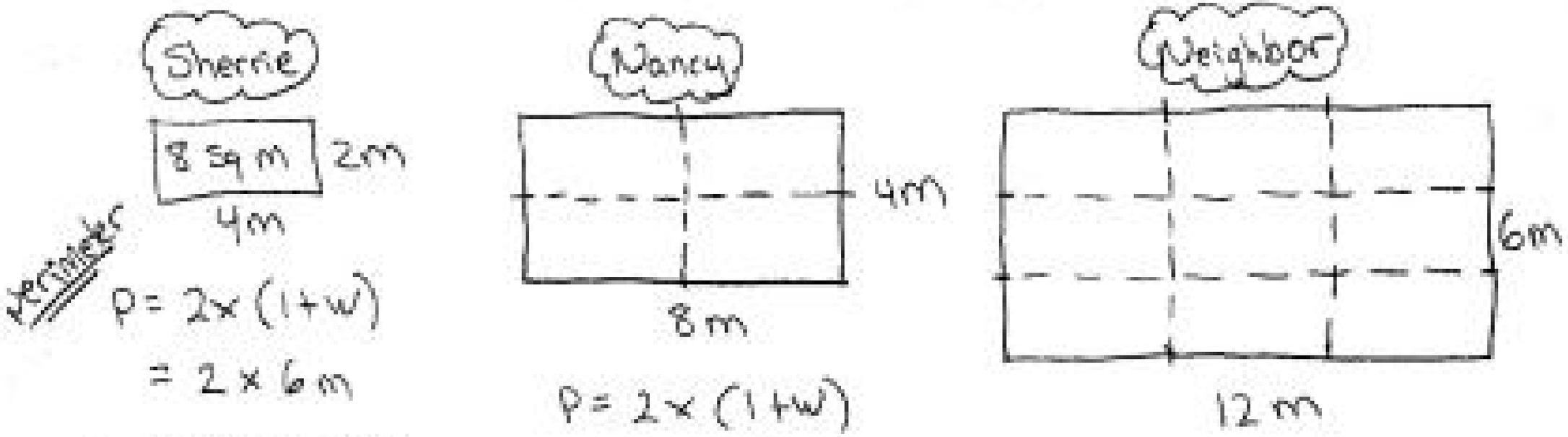
$P = 2 \times (l + w)$

$= 2 \times 12\text{ m}$

$= 24 \text{ meters}$

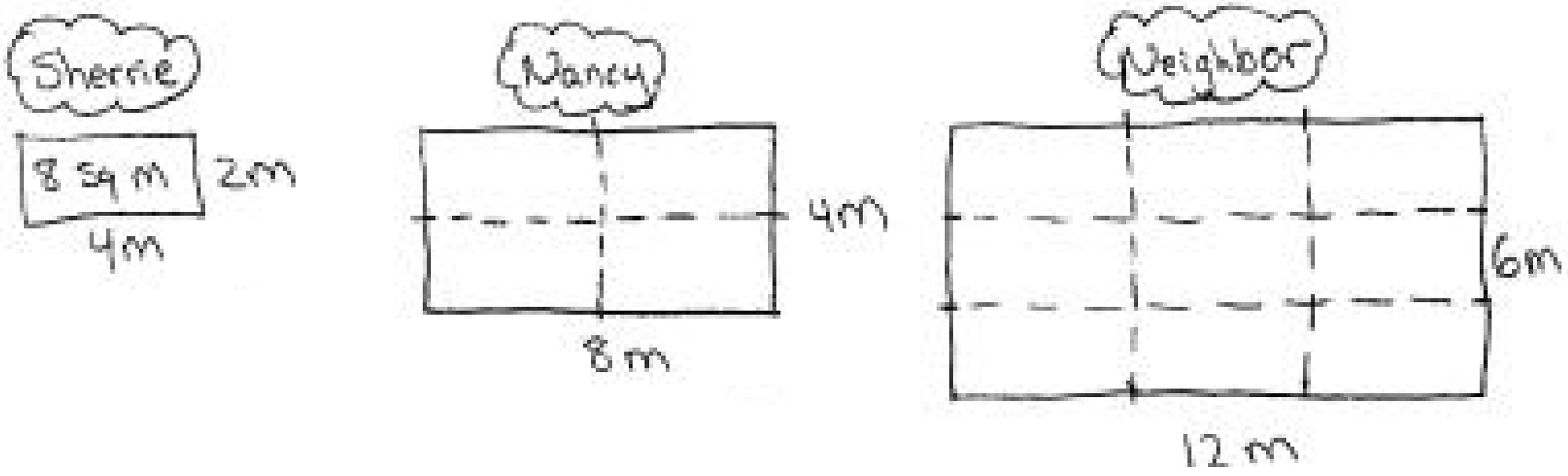
Concept Development

If Sherrie's neighbor had a garden
3 times as long and 3 times as wide
as her garden, what would be the relationship
of the perimeter between those gardens?

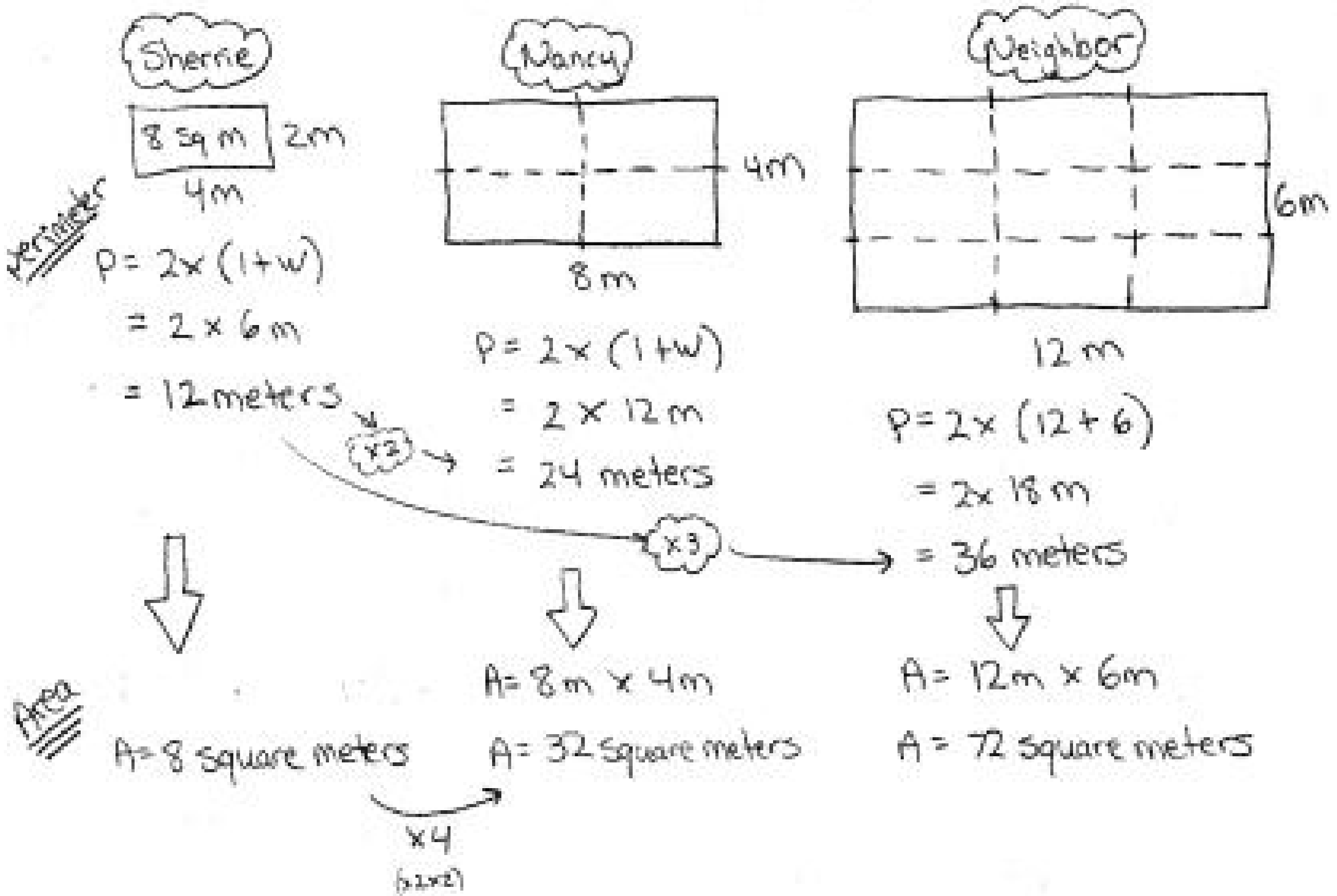


Concept Development

Solve for the area of Nancy's garden and the neighbor's garden. What do you notice about the relationship among the perimeters and areas of the three gardens?



Concept Development



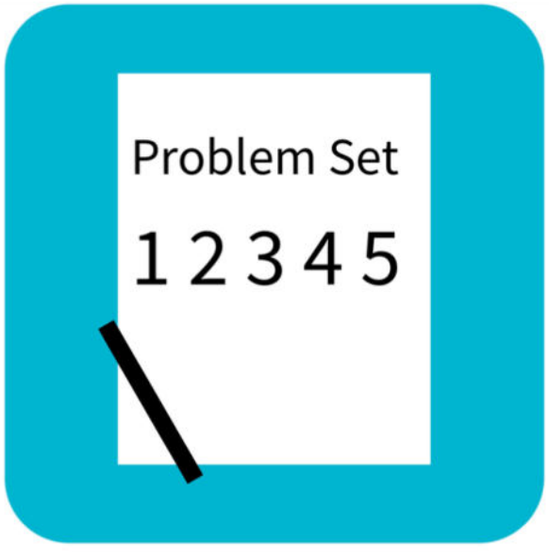
Concept Development

Create a table to show the relationship among the areas and perimeters of the three gardens.

	Sherri	Nancy	Neighbor
Perimeter			
Area			

Concept Development

	Sherrie	Nancy	Neighbor
Perimeter	12m	24m	36m
Area	8sqm	32sqm	72sqm



Problem Set

Name _____ Date _____

1. A rectangular porch is 4 feet wide. It is 3 times as long as it is wide.

   a. Label the diagram with the dimensions of the porch.

   b. Find the perimeter of the porch.

Debrief

Discuss the relationship between the area of an original rectangle and the area of a different rectangle whose width is 3 times as long as it was to start with.

Discuss the relationship between the perimeters of the sandboxes in Problem 4.

For Problem 4(e), why isn't the area twice as much if the length and width are twice as much?

What conclusion can you make about the areas of two rectangles when the widths are the same but the length of one is twice as much as the length of the other?

Debrief

What conclusion can you make about the areas of two rectangles when the length and width of one rectangle are each twice as much as the length and width of the other rectangle?

What significant math vocabulary did we use today to communicate precisely?

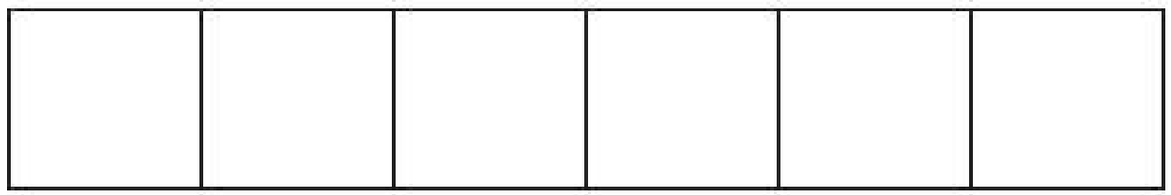
How did the Application Problem connect to today's lesson?

Exit Ticket

Name _____ Date _____

1. A table is 2 feet wide. It is 6 times as long as it is wide.

a. Label the diagram with the dimensions of the table.



b. Find the perimeter of the table.