Discovering Area and Perimeter

Objective: Students explore area and perimeter of rectangles in a sorting activity and gallery walk.

Preparation: Copy, cut, and label the sorting activity into envelopes (enough for working in pairs)

Introduction: Introduce **area** as the number of units needed to cover an area. Make a connection to an array that models multiplication or repeated addition. Give real world examples of when area is used (i.e. to figure carpet for the classroom, lawn area of the playground, paper on the bulletin board). Allow students to Think, Pair, Share other situations in which area would be used in daily life.

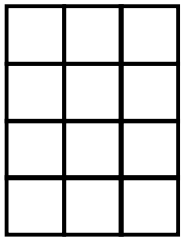
Introduce **perimeter** as the distance around an area. Give real world examples of when perimeter is used (i.e. amount of fencing needed to enclose the playground, amount of border needed to go around the bulletin board). Allow students to Think, Pair, Share other situations in which perimeter would be used in daily life.

Show examples on the board:

$$\begin{aligned} Area &= length \times width \\ &= 3 \times 4 \\ &= 12 \quad square \quad units \end{aligned}$$

or

count the squares



$$\begin{aligned} Perimeter &= 2(length) + 2(width) \\ &= 2(3) + 2(4) \\ &= 6 + 8 \\ &= 14 \, units \\ &\; or \\ &= 3 + 4 + 3 + 4 \\ &= 14 \quad units \end{aligned}$$

Cooperative Practice: (Working with a Partner) First model how students will take the sorting cards and identify which area, perimeter, and rectangle go together. Once students complete the sort, the teacher can verify the work.

Gallery Walk: After students complete their sorting activity, they can practice finding area and perimeter in a gallery walk of real world examples. They can record their findings on the Gallery Walk Recording Sheet.

California State Standards:

3MG 1.2 Estimate or determine the areas and volume of solid figures by covering them with squares or by counting the number of cubes that would fill them.
3MG 1.3 Find the perimeter of a polygon with integer sides.
4M.G. 1.0: Students understand perimeter and area.

Common Core State Standards:

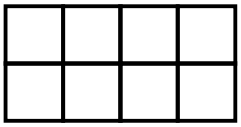
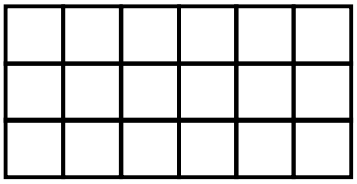
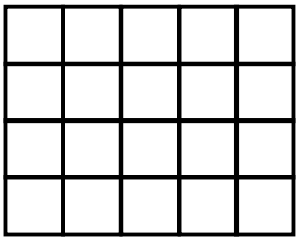
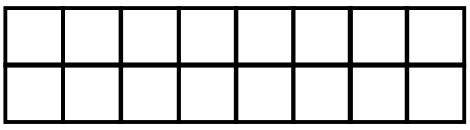
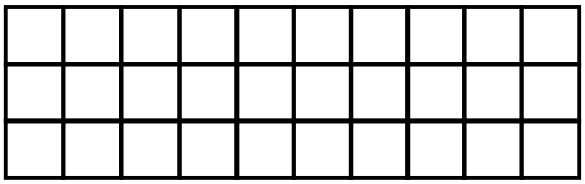
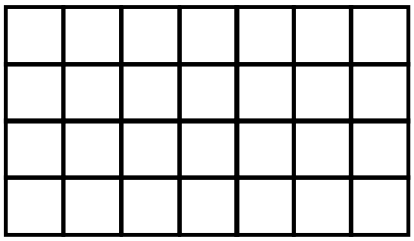
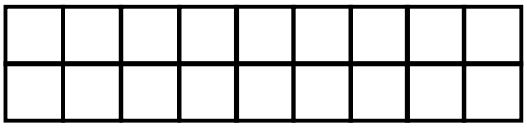
3.MD.5. Recognize area as an attribute of plane figures and understand concepts of area measurement.

a. A square with side length 1 unit, called "a unit square," is said to have "one square unit" of area, and can be used to measure area.

b. A plane figure which can be covered without gaps or overlaps by *n* unit squares is said to have an area of *n* square units.

3.MD.8. Solve real world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, and exhibiting rectangles with the same perimeter and different areas or with the same area and different perimeters.

4.MD.3: Apply the area and perimeter formulas for rectangles in real world and mathematical problems.
Directions: Cut out the boxes and sort each into sets that show the perimeter and area for each of the given rectangles.

Area *length* × *width* $5 \times 1 = 5$	*Perimeter* $5+1+5+1=12$	
Area *length* × *width* $4 \times 2 = 8$	*Perimeter* $4+2+4+2=12$	
Area *length* × *width* $6 \times 3 = 18$	*Perimeter* $6+3+6+3=18$	
Area *length* × *width* $5 \times 4 = 20$	*Perimeter* $5+4+5+4=18$	
Area *length* × *width* $8 \times 2 = 16$	*Perimeter* $8+2+8+2=20$	
Area *length* × *width* $10 \times 3 = 30$	*Perimeter* $10+3+10+3=26$	
Area *length* × *width* $7 \times 4 = 28$	*Perimeter* $7+4+7+4=22$	
Area *length* × *width* $9 \times 2 = 18$	*Perimeter* $9+2+9+2=22$	

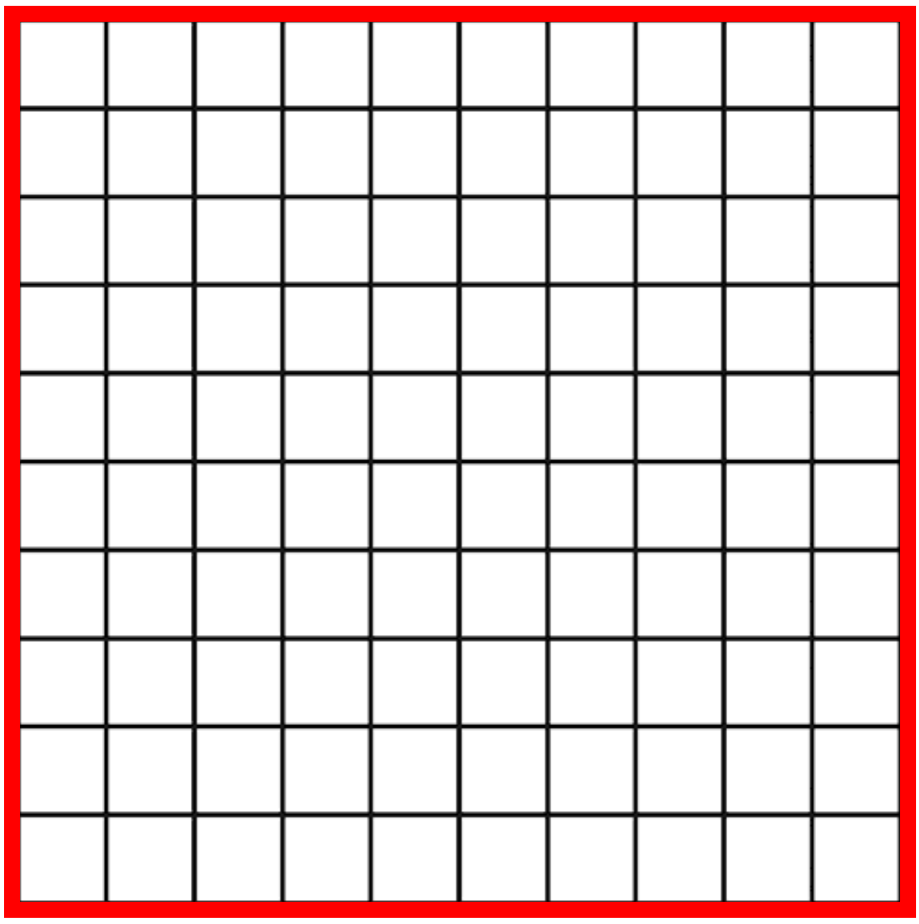
Gallery Walk
Area and Perimeter
Recording Sheet

Determine the area and perimeter for real world locations. Use the example for proper syntax.

Area	Perimeter
Location : Adam's Bedroom 10 units x 10 units = 10 x 10 x units x units (combine like terms) = 100 units squared	10 units + 10 units + 10 units + 10 units = 20 units + 20 units = 40 units
Area Location : _____	Perimeter
Area Location : _____	Perimeter
Area Location: _____	Perimeter
Area Location: _____	Perimeter

1. Adam is using this array to find the **area** of his bedroom. What multiplication sentence could be used to find the **area** of his bedroom? Find the area.

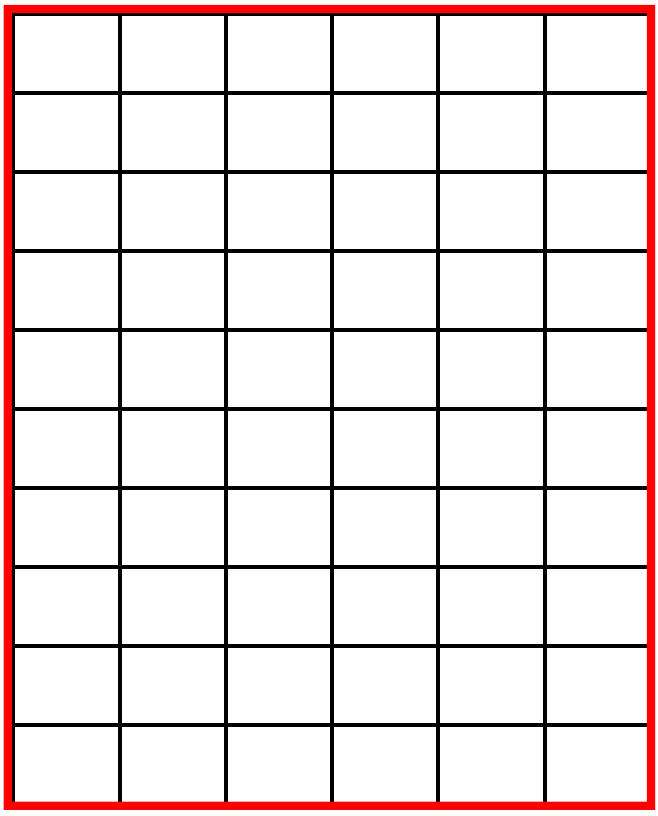
Adam wants to put a border on all 4 walls. What is the perimeter of Adam's bedroom?



2. Ms. White is using this array to find the **area** of the lunch area.

What 2 multiplication sentences could be used to find the **area** of the lunch area? Find the area.

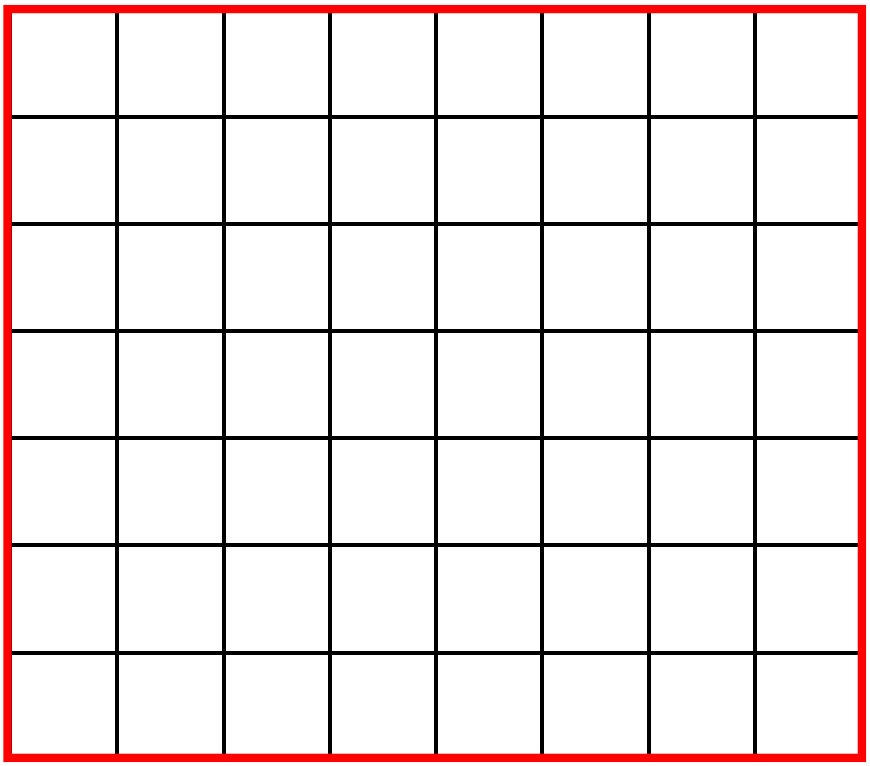
The school wants to paint a blue border in the lunch area. What is the perimeter of the lunch area?



3. Daniel is using this array to find the **area** of the baseball field.

What 2 multiplication sentences could be used to find the **area** of the baseball field? Find the area.

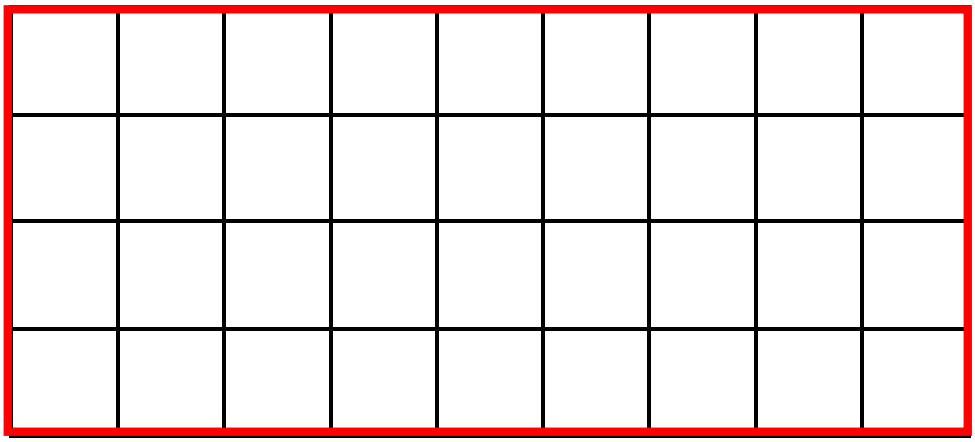
What is the perimeter of the baseball field?



4. Alexia is using this array to find the **area** of the white board.

What 2 multiplication sentences could be used to find the **area** of the white board? Find the area.

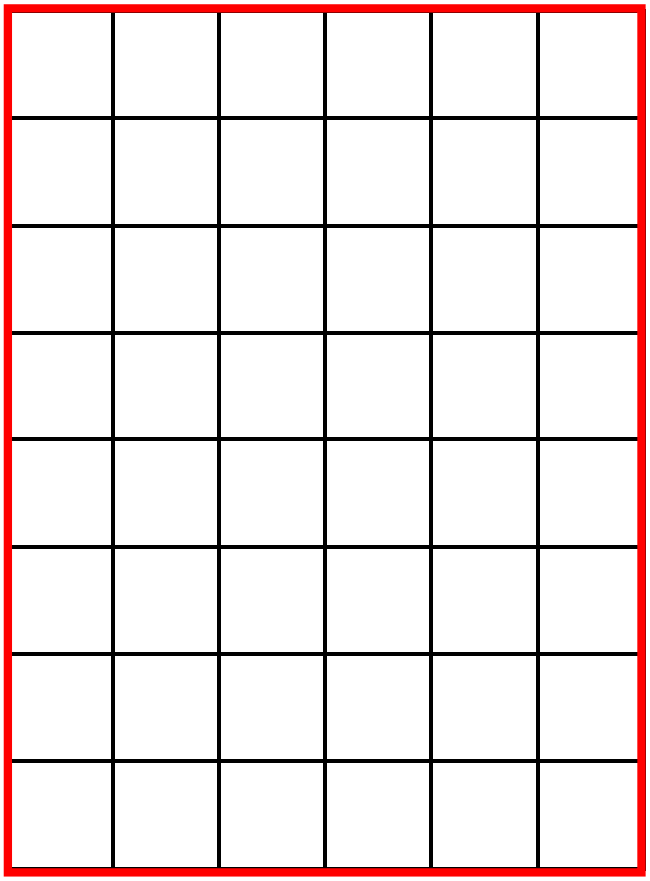
She wants to make a star border. What is the perimeter of the white board?



5. Mr. Juan is using this array to find the **area** of the wall for some new paint.

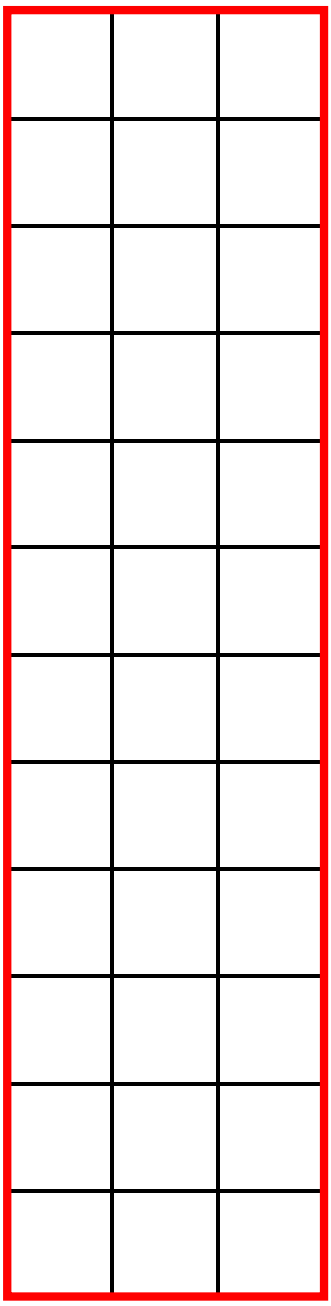
What 2 multiplication sentences could be used to find the **area** of the wall? Find the area.

If he paints a red border along each wall what is the perimeter of the walls?



6. Your uncle is using this array to find the **area** of his lawn. What 2 multiplication sentences could be used to find the **area** of the lawn? Find the area.

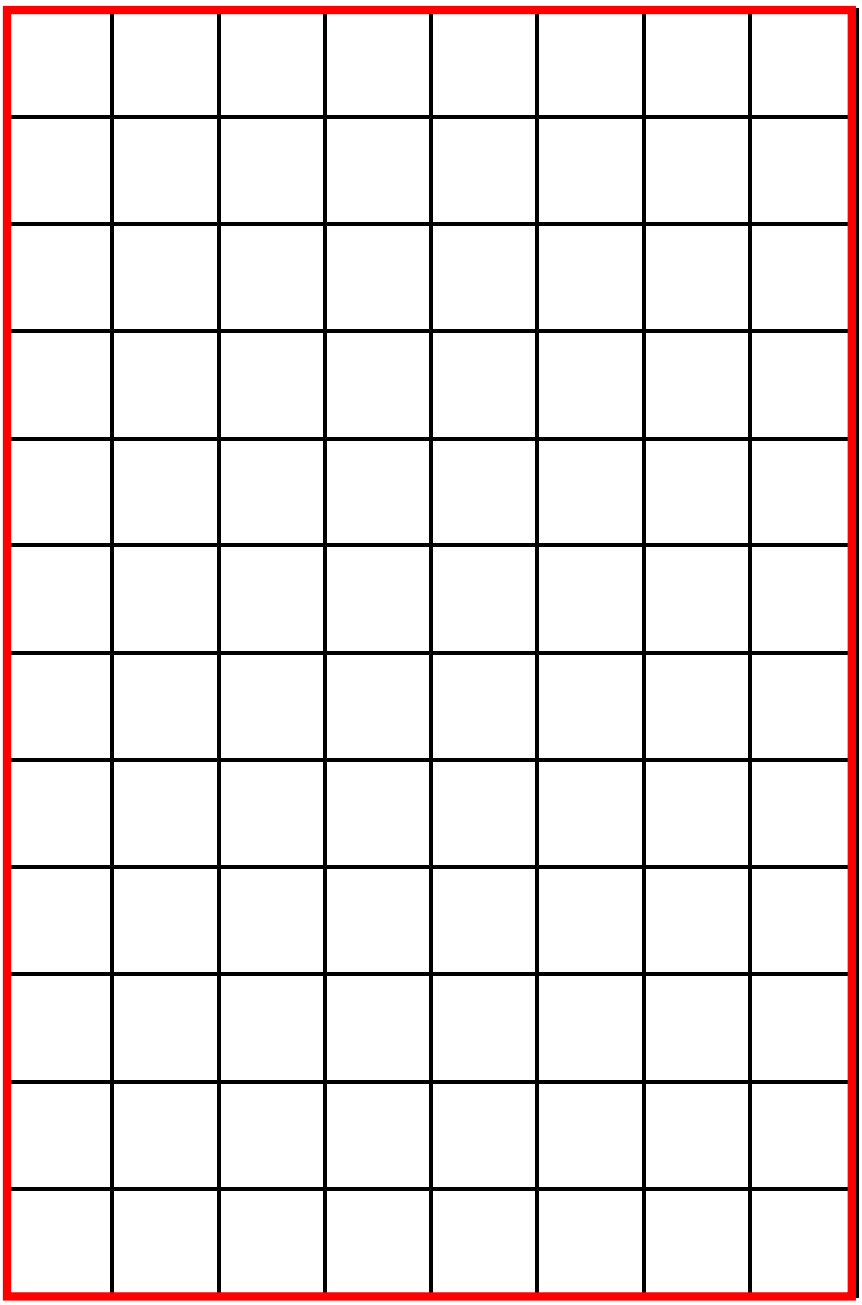
If he wants to create a walkway along the border of his lawn, what is the perimeter of the lawn?



7. Target is using this array to find the **area** of the new electronics department.

What 2 multiplication sentences could be used to find the **area** of the electronics department? Find the area.

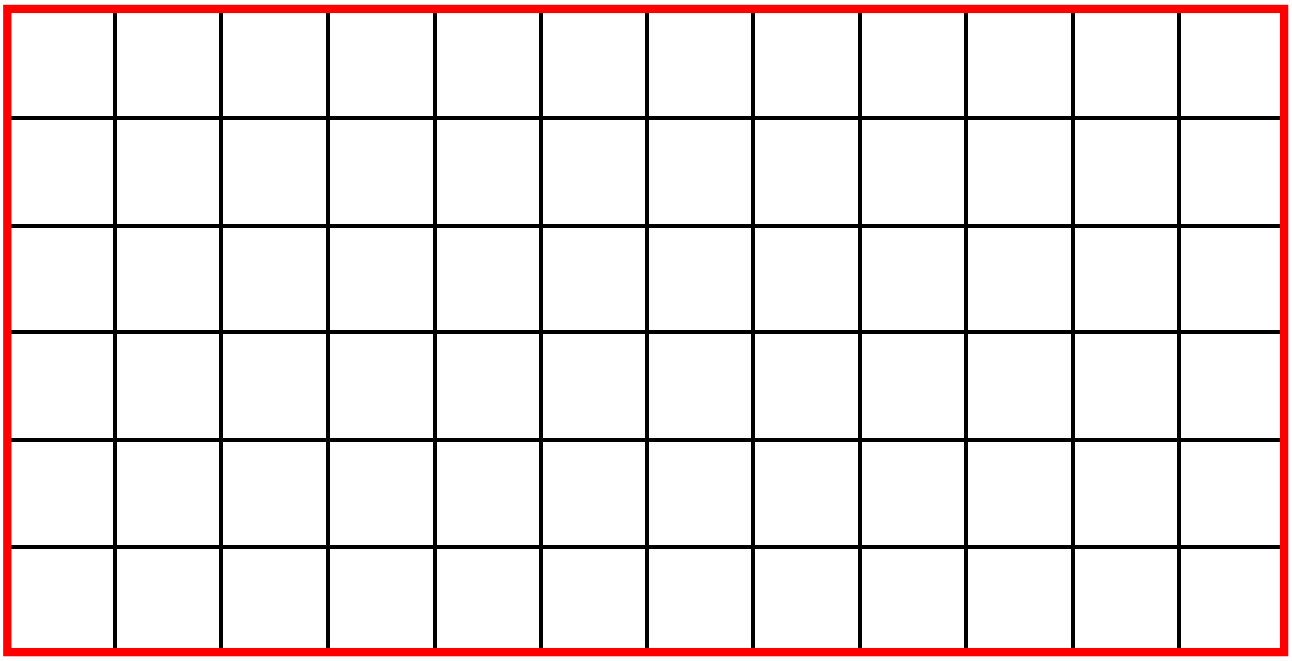
What is the perimeter of the electronics department?



8. Ms. Miller is using this array to find the **area** of the classroom.

What 2 multiplication sentences could be used to find the **area** of the classroom? Find the area.

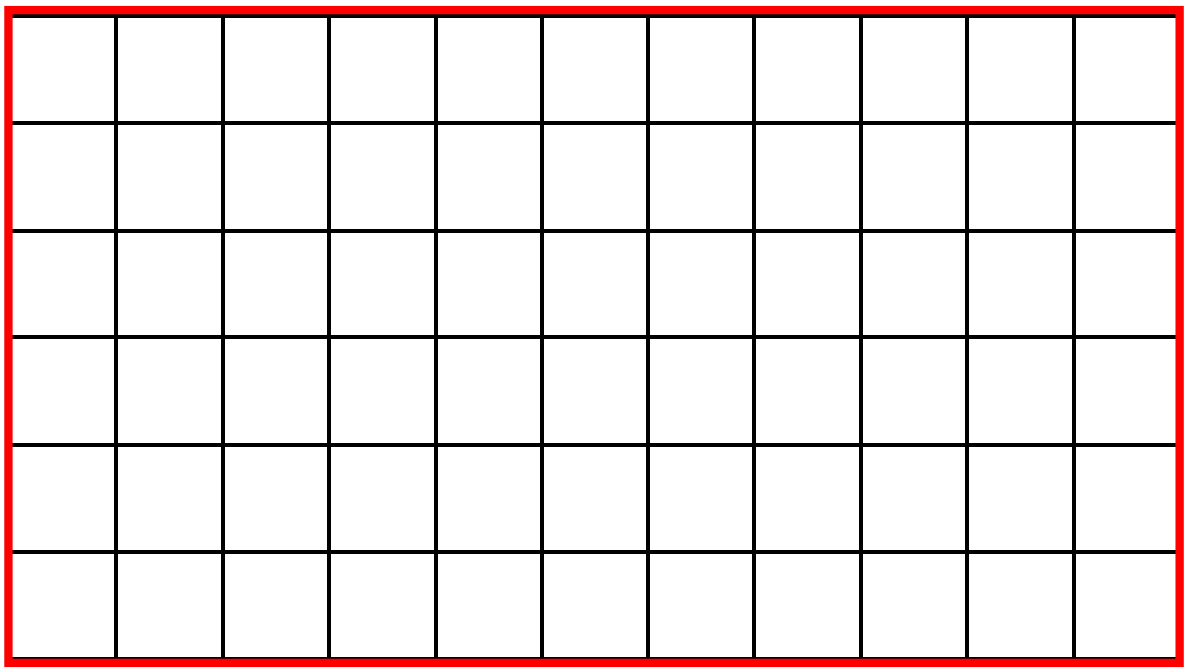
What is the perimeter of the classroom?



9. Mr. Smith is using this array to find the **area** of the computer lab.

What 2 multiplication sentences could be used to find the **area** of the computer lab? Find the area.

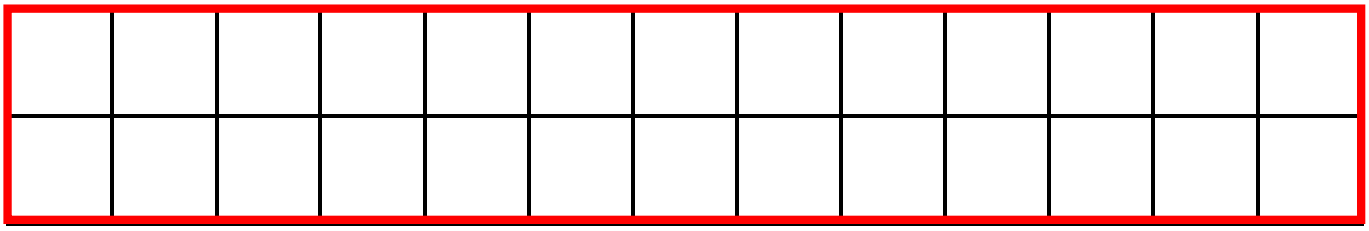
What is the perimeter of the computer lab?



10. McDonalds is using this array to find the **area** of the play area.

What 2 multiplication sentences could be used to find the **area** of the play area? Find the area.

What is the perimeter of the play area?



Warm-Up

CST #36: 3NS 2.4

Third-grade students went to a concert in 8 buses. Each bus took 45 students. How many students went to the concert?

A) 320

B) 360

C) 380

D) 3,240

Review

Identify the property of multiplication for each of the given problems as Associative, Commutative, Distributive, Identity, or Zero.

$5 \times 7 = 7 \times 5$ _____

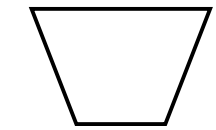
$7 \times 9 = (7 \times 5) + (7 \times 4)$

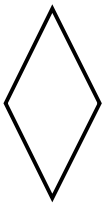
_____

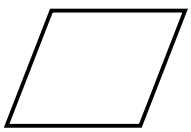
$8 \times (4 \times 3) = (8 \times 4) \times 3$

Current

Identify each quadrilateral as a rhombus, parallelogram, or trapezoid.







Other

Identify the **two multiplication** and **two division** sentences that this array models.