

# Fencing the Dog Yard

Investigation from MathBits.com

Name \_\_\_\_\_



**Supplies:** 20 Paperclips

You want to design a rectangular pen for your dog, using 20 feet of fencing. For this first part of your investigation, you decide that the length of each side of the dog yard must be an integer value.

1. Hook the paperclips together to form a chain ring. Position the paperclip ring to show rectangular dog pens of varying sizes. Draw each pen on the graph paper.
2. Complete the table below showing all possible dog pens. At the bottom of the chart, generalize the information given one side to be of length  $x$ .

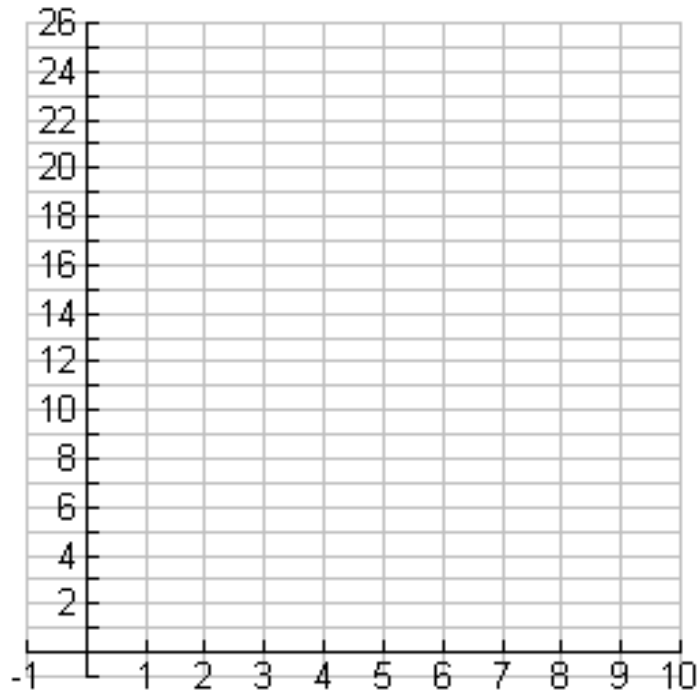
Length of side 1 (ft.)	Length of side 2 (ft.)	Perimeter (ft.)	Area (sq. ft.)
1			
2			
$x$			

3. Explain why the perimeter remains constant.
4. Under these conditions (of only using integer values):

Which dimensions give the dog the most area? \_\_\_\_\_

Which dimensions give the dog the longest run? \_\_\_\_\_

5. Using the grid below, draw a scatter plot of your data. Use the **length of Side 1** on the horizontal  $x$ -axis and the **area of the pen** on the vertical  $y$ -axis.  
Be sure to label your graph.



6. Based upon your chart investigation and your scatter plot, what “name” would be given to this type of graph? \_\_\_\_\_

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