

## Objective

Locate and name points in the first quadrant of a coordinate grid.

## Common Core State Standards

- **5.G.1** Use a pair of perpendicular number lines, called axes, to define a coordinate system, with the intersection of the lines (the origin) arranged to coincide with the 0 on each line and a given point in the plane located by using an ordered pair of numbers, called its coordinates. Understand that the first number indicates how far to travel from the origin in the direction of one axis, and the second number indicates how far to travel in the direction of the second axis, with the convention that the names of the two axes and the coordinates correspond (e.g.,  $x$ -axis and  $x$ -coordinate,  $y$ -axis and  $y$ -coordinate).
- **5.G.2** Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation.

## Geometry

## Locating Points on a Coordinate Grid

A coordinate grid is formed by two perpendicular number lines, which are used to locate and name ordered pairs. The horizontal number line is referred to as the  $x$ -axis. The vertical number line is referred to as the  $y$ -axis. The two axes intersect at the origin. The origin is labeled with the ordered pair  $(0, 0)$ . When naming ordered pairs, the  $x$ -axis coordinate is first, followed by the  $y$ -axis coordinate. The ordered pair is written with the  $x$ - and  $y$ -coordinates separated by a comma in a set of parentheses. For example, the ordered pair for the point five units right of  $(0, 0)$  (along the  $x$ -axis) and three units above  $(0, 0)$  (along the  $y$ -axis) is written as  $(5, 3)$ .

**Try It!** Perform the Try It! activity on the next page.

## Talk About It

Discuss the Try It! activity.

- Have students look at their coordinate grids.
- **Ask:** *How did you know where to mark the final ordered pair?*
- **Ask:** *What ordered pair marks the location of Sean's final cone?*

## Solve It

With students, reread the problem. Suppose Sean wanted to alter his course to form a square. How could he move two points on his grid to make a square course? Name all four ordered pairs.

## More Ideas

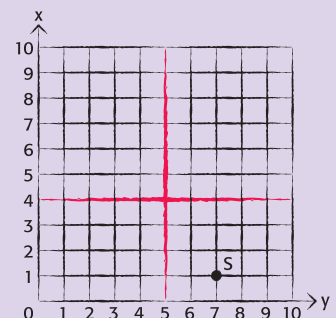
For other ways to teach about coordinate grids—

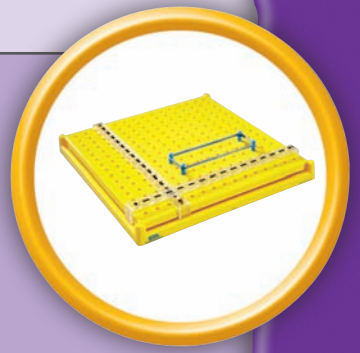
- Have students mark on a Coordinate Grid (BLM 2) ordered pairs that form a simple picture. Have students create a set of directions for other students to replicate the picture.
- Have students play "battleship" with Coordinate Grids; one student secretly marks locations of "ships" and the other guesses.

## Formative Assessment

Have students complete the following activity.

*Name the point S on the coordinate grid as an ordered pair. Mark a second point B on the grid that has a location of  $(5, 2)$ .*





**Try It!** 30 minutes | Pairs

Here is a problem using a coordinate grid.

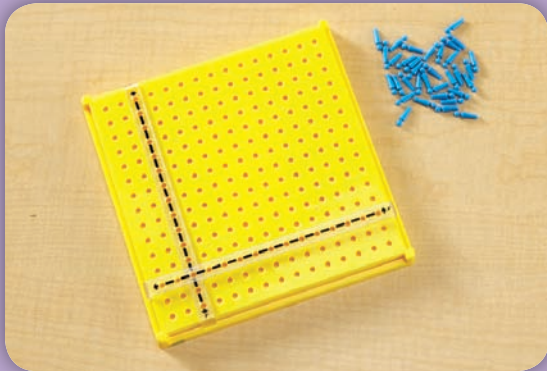
Sean wants to set up an obstacle course in his backyard. He wants to put cones at four corners of the course to make a rectangle. He makes a grid to mark the course. He marks the ordered pairs  $(2, 2)$ ,  $(10, 2)$ , and  $(2, 8)$  as locations for placing cones. At which ordered pair should he place the final cone?

Introduce the problem. Then have students do the activity to solve the problem. Distribute the XY Coordinate Pegboards to students.

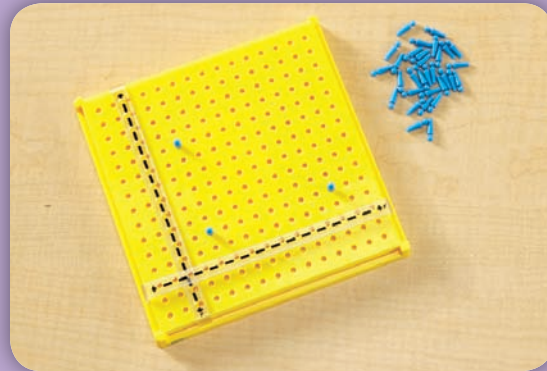
**Say:** Follow the steps below to show Sean where to place the final cone.

**Materials**

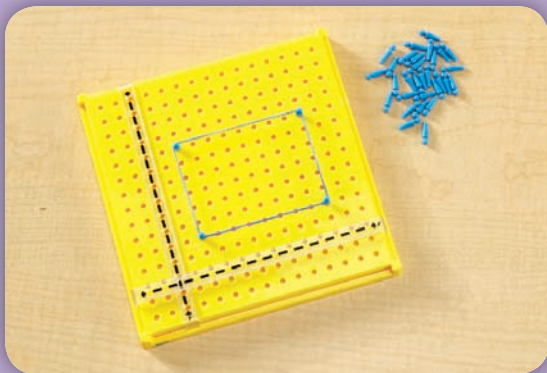
- XY Coordinate Pegboard (1 per pair)



**1.** To begin, have students slide the bars that represent the horizontal and vertical number lines (axes) so the intersection of the lines is near the bottom left of the grid.



**2.** Have students use the pegs to mark the cones Sean has already set. Make sure they remember to start at the origin (the intersection of the axes) and count across the horizontal axis the number of units given first in each ordered pair, then up the number of units given second in the ordered pair.



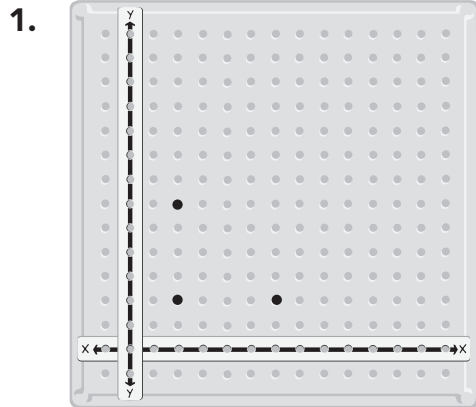
**3.** Determine the location of the fourth vertex that completes the rectangle. Determine its horizontal and vertical coordinates. Place a peg at the location of the ordered pair. Use a rubber band to check that your figure is a rectangle.

**! Look Out!**

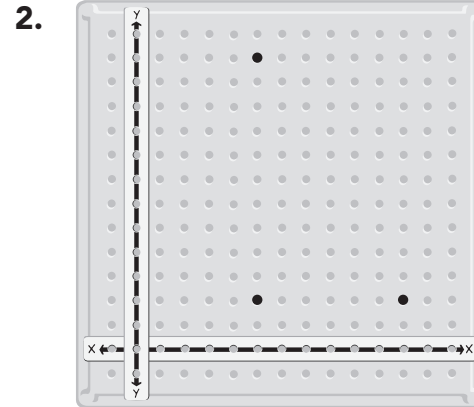
Watch for students who interchange the horizontal and vertical coordinate values when reading or writing ordered pairs. Remind them to start by moving left or right the distance specified by the first number and then going up or down the distance specified by the second number.

Use an XY Coordinate Pegboard, pegs, and rubber bands to model the points shown. Find the missing vertex of each rectangle. Write the ordered pair.

(Check students' work.)



(6, 6)

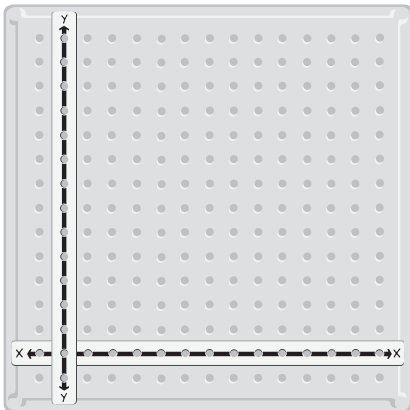


(11, 12)

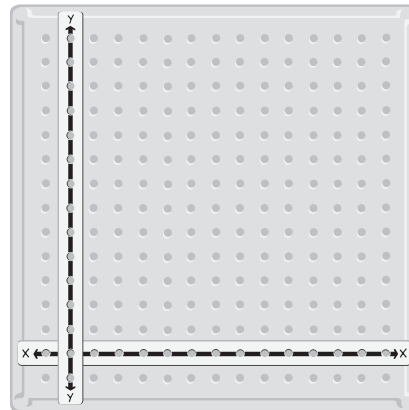
Using an XY Coordinate Pegboard, pegs, and rubber bands, model each rectangle. Sketch the rectangle on the pegboards. Write the ordered pair for the missing vertex.

(Check students' models.)

3.  $(3, 6), (3, 2), (8, 6),$  (8, 2)



4.  $(4, 4), (9, 4), (9, 11),$  (4, 11)



Find the missing vertex of each rectangle. Write the ordered pair.

5.  $(5, 5), (7, 7), (7, 5),$  (5, 7)

6.  $(1, 8), (1, 5), (2, 5),$  (2, 8)

7.  $(7, 3), (7, 9), (4, 3),$  (4, 9)

8.  $(2, 2), (5, 2), (2, 5),$  (5, 5)

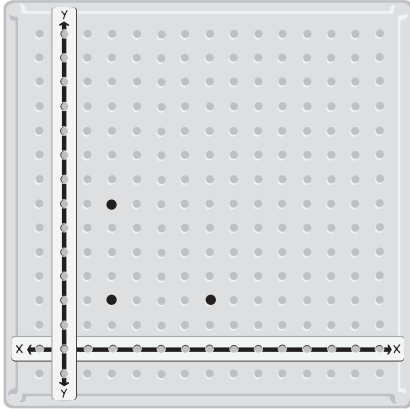
9.  $(3, 0), (3, 6), (4, 6),$  (4, 0)

10.  $(4, 1), (8, 5), (8, 1),$  (4, 5)



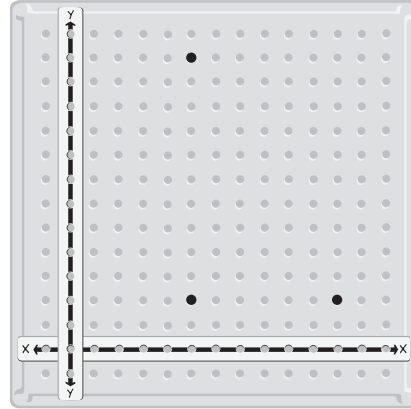
Use an XY Coordinate Pegboard, pegs, and rubber bands to model the points shown. Find the missing vertex of each rectangle. Write the ordered pair.

1.



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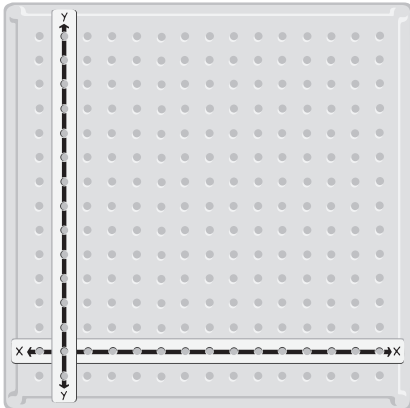
2.



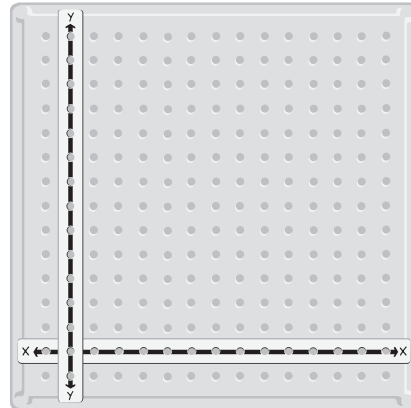
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Using an XY Coordinate Pegboard, pegs, and rubber bands, model each rectangle. Sketch the rectangle on the pegboards. Write the ordered pair for the missing vertex.

3.  $(3, 6), (3, 2), (8, 6),$  \_\_\_\_\_



4.  $(4, 4), (9, 4), (9, 11),$  \_\_\_\_\_



Find the missing vertex of each rectangle. Write the ordered pair.

5.  $(5, 5), (7, 7), (7, 5),$  \_\_\_\_\_

6.  $(1, 8), (1, 5), (2, 5),$  \_\_\_\_\_

7.  $(7, 3), (7, 9), (4, 3),$  \_\_\_\_\_

8.  $(2, 2), (5, 2), (2, 5),$  \_\_\_\_\_

9.  $(3, 0), (3, 6), (4, 6),$  \_\_\_\_\_

10.  $(4, 1), (8, 5), (8, 1),$  \_\_\_\_\_

