

Objective

Follow and create directions between 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

Directions on a Coordinate Grid

Each location on a coordinate grid is unique. An ordered pair names the specific location on the grid. There are numerous paths that can be followed from one ordered pair to another.

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

Talk About It

Have students look at the marked grids and written directions used in the Try It! activity on the next page to explore following directions on coordinate grids.

- **Ask:** What ordered pair represents the location of Laura's friend's house?
- **Ask:** Which other way could Laura locate her friend's house on the map?

Solve It

With students, reread the problem. After leaving her friend's house, Laura decides to walk to the library, which is located at (3, 6) on the map. Write a sentence giving her directions to find the library from her friend's house and then from the library back to her house.

More Ideas

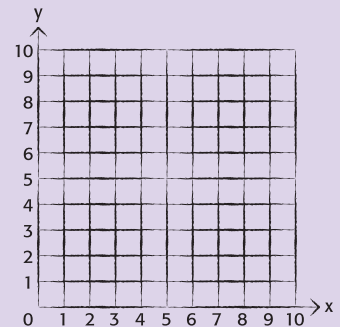
For other ways to teach about directions on coordinate grids—

- Have students make coordinate grids and maps of the classroom or school on a Centimeter Grid (BLM 6) and write directions to and from various locations.
- Have students label a city street map (real or fictional) as a coordinate grid. They should write and follow directions to and from certain locations.
- Have students conduct an archeological "dig" (or other similar activity) using square netting with lines labeled as a coordinate grid to document the locations of "important findings."

Formative Assessment

Have students complete the following activity.

Write directions to get from (3, 10) to (7, 5) on a coordinate grid.



Try It!

30 minutes | Pairs

Here is a problem using a coordinate grid.

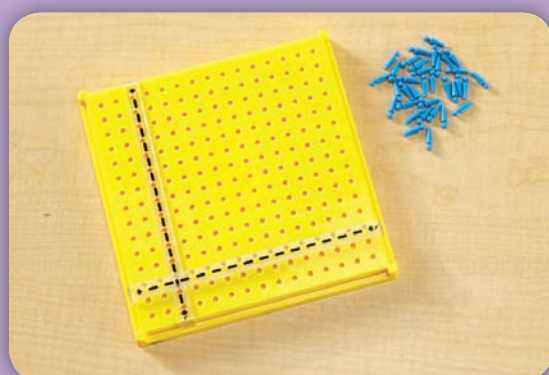
Laura is trying to get from her house to a friend's house by looking at the grid on a map. Laura's house is located at (4, 1). Her friend told her to follow the map up seven blocks and right four blocks. At what ordered pair on the map is her friend's house located?

Introduce the problem. Then have students do the activity to solve the problem.

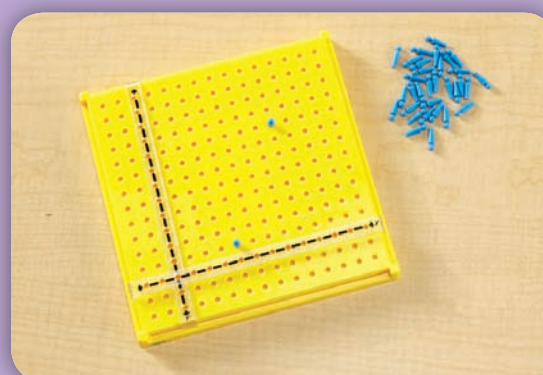
Say: Follow the steps below to show Laura how to get to her friend's house.

Materials

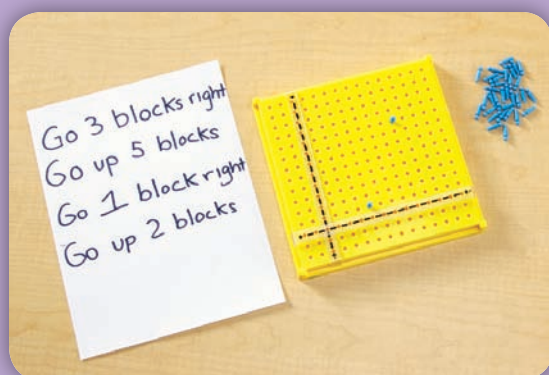
- XY Coordinate Pegboard (1 per pair)
- paper
- pencils



1. Slide the bars that represent the horizontal and vertical number lines (axes) so the intersection of these lines is near the bottom left of the grid.



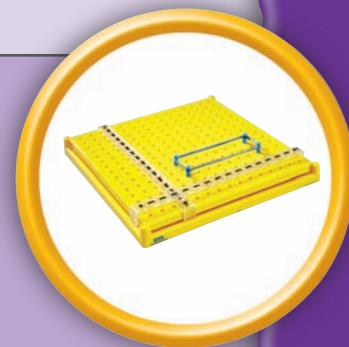
2. Use a peg to mark the location of Laura's house. From the peg, follow the directions to find the location of Laura's friend's house. Name the ordered pair that represents the location of her friend's house.



3. Write a set of alternative directions to locate Laura's friend's house on the map.

Look Out!

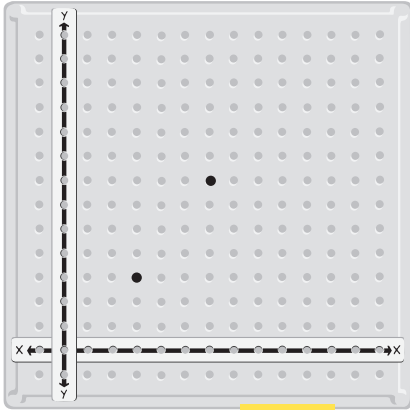
Watch out for students who reverse the directions. Remind them that you can start all sets of directions from the origin (0, 0). Also, look out for students who reverse the order of the coordinates.



Use an XY Coordinate Pegboard and pegs to model each starting point and ending point. Find the ordered pair of the ending point, given the starting point.

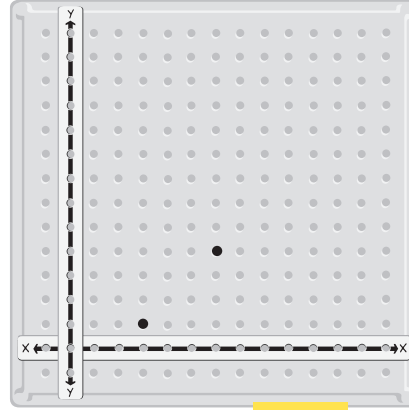
(Check students' work.)

1. From (6, 7), go 3 units left and 4 units down



Ending point: (3, 3)

2. From (3, 1), go 4 units right, 3 units up, and 1 unit left

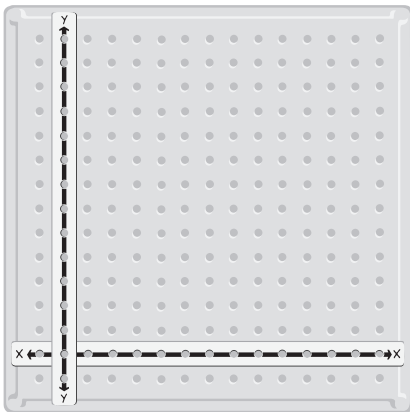


Ending point: (6, 4)

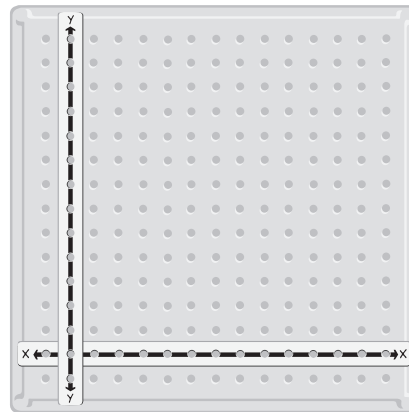
Using an XY Coordinate Pegboard and pegs, model each set of directions. Sketch the starting point and ending point. Write the ordered pair of the ending point.

(Check students' models.)

3. **Start:** (2, 7); **Move:** 5 units right, 6 units down; **End:** (7, 1)



4. **Start:** (8, 9); **Move:** 3 units left, 4 units up; **End:** (5, 13)



Begin at the Start and follow the directions. Write the ordered pair where you end.

5. **Start:** (0, 2); **Move:** right 8 units, 4 units up; **End:** (8, 6)

6. **Start:** (6, 10); **Move:** left 1 unit, 3 units up; **End:** (5, 13)

7. **Start:** (4, 7); **Move:** left 2 units, 2 units down; **End:** (2, 5)

8. **Start:** (8, 6); **Move:** left 6 units, 3 units up; **End:** (2, 9)

Answer Key

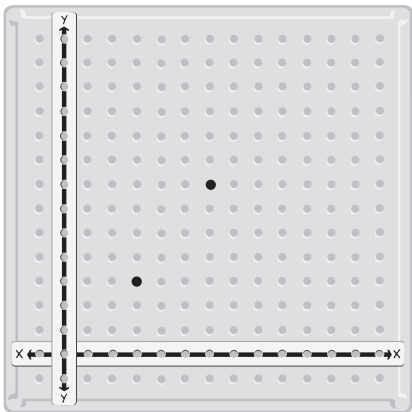
Challenge! From the point (5, 3) you are given the direction to move left. What are the possible x-values of the ordered pair of the new point?

Challenge: 0, 1, 2, 3, and 4

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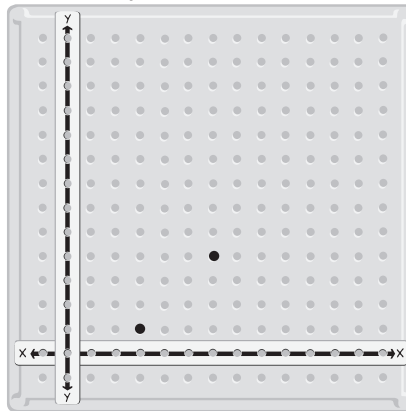
Use an XY Coordinate Pegboard and pegs to model each starting point and ending point. Find the ordered pair of the ending point, given the starting point.

1. From (6, 7), go 3 units left and 4 units down



Ending point: _____

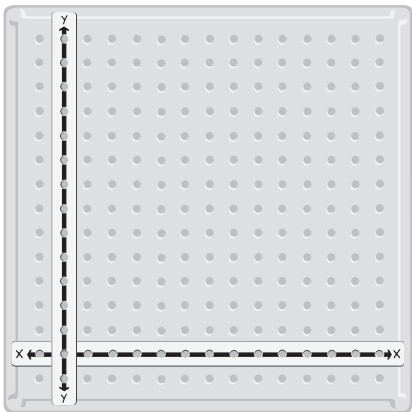
2. From (3, 1), go 4 units right, 3 units up, and 1 unit left



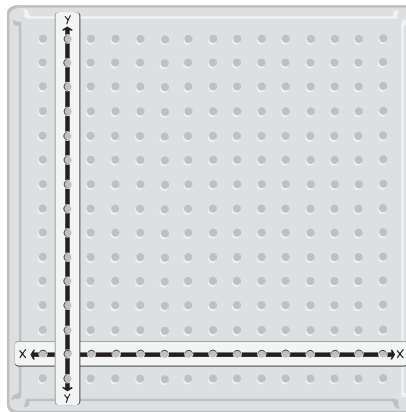
Ending point: _____

Using an XY Coordinate Pegboard and pegs, model each set of directions. Sketch the starting point and ending point. Write the ordered pair of the ending point.

3. **Start:** (2, 7); **Move:** 5 units right, 6 units down; **End:** _____



4. **Start:** (8, 9); **Move:** 3 units left, 4 units up; **End:** _____



Begin at the Start and follow the directions. Write the ordered pair where you end.

5. **Start:** (0, 2); **Move:** right 8 units, 4 units up; **End:** _____

7. **Start:** (4, 7); **Move:** left 2 units, 2 units down; **End:** _____

6. **Start:** (6, 10); **Move:** left 1 unit, 3 units up; **End:** _____

8. **Start:** (8, 6); **Move:** left 6 units, 3 units up; **End:** _____

Name _____

Challenge! From the point (5, 3) you are given the direction to move left. What are the possible x-values of the ordered pair of the new point?

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