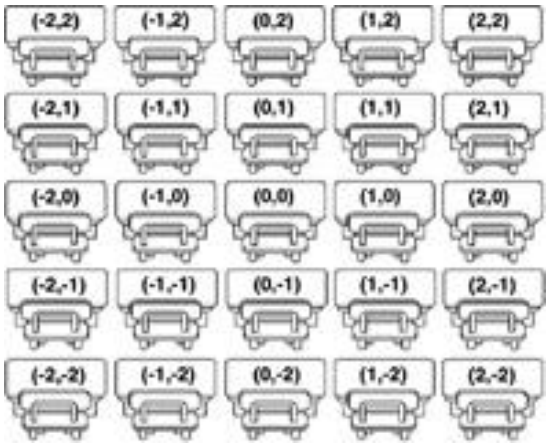
Human Coordinate Plane: Student Worksheet



Name: _____

Hook

Arrange 25 desks in a square array and have students sit in them. Explain that they are a human coordinate plane and each of them is to receive a card with an ordered pair (x,y) on it. Ask students who are not seated to distribute the ordered pair cards to the appropriate location. They may need to refer to a grid with points labeled as shown:

(-2,2)	(-1,2)	(0,2)	(1,2)	(2,2)
(-2,1)	(-1,1)	(0,1)	(1,1)	(2,1)
(-2,0)	(-1,0)	(0,0)	(1,0)	(2,0)
(-2,-1)	(-1,-1)	(0,-1)	(1,-1)	(2,-1)
(-2,-2)	(-1,-2)	(0,-2)	(1,-2)	(2,-2)

Group Arrangement

Students work individually and as a class

Tools

- 25 large ordered pair cards labeled as shown above
- large grid with the points shown above labeled
- overhead projector or chalkboard

Procedure

1. Ask the student whose ordered pair card has 0 as the first number to stand. Through discussion identify 0 as the x-coordinate and the students standing as the y-axis, they should now sit and students whose ordered card pair has 0 as the second number should stand. Again, discussion should identify the 0 as the y-coordinate and the students standing as the x-axis.

2. Ask each student with an x-coordinate of 1 to stand up and write x = 1 on the board. Now ask students with an x-coordinate of -2 to stand and write x = -2 on the board. Through discussion, lead students to see that equations of the form shown are:
   a. a vertical line
   b. parallel to the y-axis

3. Ask each student with a y-coordinate of 1 to stand up and write y = 1 on the board. Now ask students with a y-coordinate of -1 to stand and write y = -1 on the board. Through discussion, lead students to see that equations of the form shown are:
   a. a horizontal line
   b. parallel to the x-axis

4. Ask the students whose ordered pair has a sum of 1 to stand and write $x + y = 1$. These students should remain standing while students whose ordered pair first number - the second number equals 1 stand. Write $x - y = 1$ on the board. Through discussion, lead student to see that (1,0) is a point on both lines and represents the point of intersection. Substitute values in the equations on the board to show that (1,0) makes both $x + y = 1$ and $x - y = 1$ true.

5. Repeat the above process using $x + y = 1$ and $x + y = 2$. Guide students to discover that if there is no point of intersection, the lines are parallel.

As a result of this activity, students will have a better understanding of the coordinate plane.

Ask students whose ordered pair sum is 2 to raise their hands. Now ask students whose ordered pair sum in <u>less than 2</u> to stand and write $x + y < 2$ on the board. Show the students a graph with a dotted line for $x+ y = 2$ and shading for $x + y < 2$. Note that the shading includes all points, not just integral values. Repeat the process for other inequalities.