

GED 2002 Teachers' Handbook of Lesson Plans

Content Area Mathematics	Lesson Topic/Theme <i>Using Coordinate Plane Grids</i>	Correlation to Math Framework 05.14/05.16	Lesson Number - 52
<p>Title: The Coordinate Plane Objectives/Learner Outcomes</p> <p>At the end of this lesson, the learner will be able to:</p> <ul style="list-style-type: none"> • Identify the origin • Identify which number is the x-value in a coordinate pair • Identify which number is the y-value in the coordinate pair • Identify which axis is the x-axis • Identify which axis is the y-axis • Name each quadrant • Plot a point in any quadrant 		<p>Materials/Resources/Internet Sites/Handouts/Worksheets</p> <ul style="list-style-type: none"> • Chart paper/white board • Markers • Handout – <i>Where's My Location?</i> (directions) • Handout – <i>What's My Location?</i> (clues) • Internet Resources <ul style="list-style-type: none"> ○ Coordinate Grid http://score.kings.k12.ca.us/lessons/graphing/coordinate.html ○ Coordinate plane worksheets (Copies can be made from the website.) ○ Coordinate plane overhead transparency 	
<p>Pre-Requisite Knowledge</p> <p>The learner should be able to:</p> <ul style="list-style-type: none"> • Count using whole numbers • Recognize positive and negative numbers 		<p>Key Words</p> <ul style="list-style-type: none"> • Coordinate plane • Origin • Coordinate pair • x-axis • y-axis • Quadrant • Point 	
<p>Anticipatory Set/Introduction</p> <p>Show: the overhead transparency of the coordinate plane. Say: Today, we will be discussing this whole picture, which is called the coordinate plane.</p>			

Preview Questions for Lesson

1. Who has seen a coordinate plane grid?
2. What can you graph on the coordinate plane grid? (Answers can include points, lines, circles, shapes, etc.)
3. Who has heard of the term “axis” before?
4. Can anyone identify an axis on the coordinate plane grid?
5. Where do you think the middle of the coordinate plane lies?
6. Who has heard of the term “quadrant”?
7. What does the prefix “quad” mean?

Instructional Outline

Say: The coordinate plane is what you call this whole thing (point to the picture). There are many special parts of the coordinate plane.

Ask: Do there seem to be two *main* lines in this plane? (Students should identify the axes.)

Say: The horizontal line that’s shown in bold is the *x*-axis. The vertical line that’s shown in bold is the *y*-axis.

Ask: Do you think there’s something special about where the two axes intersect?

Say: Where the lines intersect is called the origin.

Ask: Has anyone heard of the word “origin” in another way that isn’t math related? What does it mean in that context? (If needed, lead students to see that the word “origin” means beginning or starting point. A great example is: The origin of my trip was Orlando.) Explain to students that the origin in the coordinate plane is always the place where you start when graphing a point.

Ask: Does the plane appear to be broken into a few big sections? (Answer: Yes, there are four of them.)

Say: Each of these four areas is called a “quadrant.” (Identify each quadrant and its name/number.) I would like to put a point in this coordinate plane and I want it to be in Quadrant I (point to this quadrant). Ask a student to come up to the board/chart and color in a point.

Say: I want to identify this point so that I know where it is. We can do this by using what’s called a coordinate pair.

Ask: How many parts do you think is in a *coordinate pair*? (Answer: two) What else have we discussed today that had two pieces? (Answer: the axes)

Say: A coordinate pair acts like the directions to find a particular point. It’s written in this format (*x*, *y*). You will always start at the origin. The first part tells how you move along the *x*-axis (left or right). The second part tells how you move up or down. One saying to help you remember this is “first you crawl and then you fly.” Notice that “crawling” talks about how you move left or right along the *x*-axis and “flying” talks about how you move up or down. The origin is always at (0, 0). Let’s use the point that we have on the plane. Start at the origin.

Ask: From here, do I need to move left or right? Then do I have to move up or down? Explain to the students that moving to the left means a negative number and moving down also means a negative number. Use the concept of a number line to prove this.

Say: I know that a particular point has the coordinate pair (2, 5).

Ask: Where do I start? (Answer: the origin)

Ask: What type of 2 is it? (Answer: positive) Does that tell you to move left or right? (Answer: right)

Ask: What type of 5 is it? (Answer: positive) Does that tell you to move up or down? (Answer: up)

Complete similar examples with students.

Process/Activities			
<p>Give students the handouts – Where’s My Location? (directions) and What’s My Location? (clues). Have students work individually, in pairs, or in small groups.</p> <p>Say: We are now going to play Where’s My Location? (Instructor should go over the directions with students before beginning the activity. Refer to the Where’s My Location? direction sheet for more information.)</p> <p>Complete the activity and ask students what state’s abbreviation is shown.</p>			
Product/Evaluation/Summary			
<p>Check: Points plotted on the coordinate plane worksheets.</p> <p>Ask students to identify:</p> <ul style="list-style-type: none"> • The coordinate pair for a plotted point • Quadrants 1, 2, 3, and 4 • The x-axis and then the y-axis • The origin and state its coordinate pair <p>Ask students which part of the coordinate pair relates to:</p> <ul style="list-style-type: none"> • Right or left movement. • Up or down movement 			
Teaching to Different Types of Learners			
	Visual	Auditory	Kinesthetic/Tactile
Learning Activity	Provide written directions, charts, and worksheets to students.	Incorporate activities that allow students to work together and discuss what they have done. Have students repeat answers or directions to you.	Students can draw their own coordinate plane, rather than using the one on the worksheet.
Special Differentiation Strategies	Use an overhead transparency to visually show the correct answers for all activities and extra notes. When providing directions orally, have them in writing as well.	Check for understanding by asking questions when giving directions or assignments in writing.	Students can create their own coordinate planes by using string segments. Plotted points can be identified with coins placed at the appropriate spots on the string grid.

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Evaluation	Allow learners to write their answers instead of saying them aloud.	Allow students to orally report what they have learned.	Allow students to use different manipulatives (strings, straws, coins, etc.) to demonstrate how to plot points on a coordinate plane.

The Family and Adult Literacy Connection

If students have school-aged children, have them complete similar examples from the worksheet. Students can also point out things that resemble the coordinate plane (such as a window with four window panes).

Students can put the coordinate plane into real world situations by looking at maps. Instructors can facilitate this by having examples ready to show (such as in newspapers, tourism guides, etc.). The coordinate plane can also be connected to art and archeology.

ESE/ESOL Accommodations

Partner students with a peer buddy who can facilitate discussion and model tasks. Allow for non-verbal responses such as pointing, nodding, or showing directions (left, right, up or down) with fingers or hand movements.

Help students to plot points by providing them with rulers or straight edges to assist them in drawing lines to connect to the point requested.

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Where's My Location? - Directions

1. Cut up the "locations" into individual strips and place them in a bag.
2. Pass out the coordinate plane worksheets.
3. Pick out one "location" from the bag and read it aloud. (This can be done by either a student or the instructor.)
4. As the clues are read and students plot each point, the point can also be plotted on the overhead transparency.
5. Make sure that students are labeling each point with the letter given in the clue.
6. Once all the clues have been read, tell students to do the following:
 - a. Connect points A and B with a segment
 - b. Connect points B and C with a segment
 - c. Connect points C and D with a segment
 - d. Connect points E and G with a segment
 - e. Connect points F and G with a segment
 - f. Connect points G and H with a segment
7. Ask students: "What's my location?" (Answer: NY or New York)

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What's My Location?

Clues

I reside at (-5, -2) and am called point A.

I reside at (-5, 6) and am called point B.

I reside at (1, -2) and am called point C.

I reside at (1, 6) and am called point D.

I reside at (3, 6) and am called point E.

I reside at (9, 6) and am called point F.

I reside at (6, 3) and am called point G.

I reside at (6, -2) and am called point H.