

## 5E Lesson Plan Format Graphing Ordered Pairs

**teach**HOUSTON Student Name(s):

Mentor Teacher Name:

Grade Level: 5th

Lesson Teaching Date and Time:

**Concept(s):** In mathematics, an ordered pair is a pair of numbers used to name a location on a coordinate plane. The order of the elements in an ordered pair is important; for example, (4, 6) is different than (6, 4). Understanding ordered pairs is a prerequisite for graphing and writing linear equation in Algebra 1. Ordered pairs are often used on maps; linear equations are used to model and make predictions about real life data.

**TEKS:**

The student is expected to:

5.9 Locate and name points on a coordinate grid using ordered pairs of whole numbers.

Objectives	Evaluation Questions for each Objective
1. Define and locate on a coordinate plane: x-axis, y-axis, origin.	
2. Name an ordered pair given a point on a coordinate plane in the 1 <sup>st</sup> quadrant.	
3. Graph a point on a coordinate grid in the 1 <sup>st</sup> quadrant given an ordered pair.	

## Materials List

For the teacher:

- Overhead projector or ELMO
- Grid transparency

For each student:

- Class set of communicators or white boards
- Dry erase markers and erasers for communicators
- Enough sheets of grid paper (about 2 or 3 per student)
- Hurricane tracking map

## Advanced Preparations:

<b>ENGAGEMENT</b>		
<b>What the Teacher Will Do</b>	<b>Eliciting Questions/ Student Responses</b>	<b>What the Students Will Do</b>
<p>The teacher will provide each student with a hurricane tracking map (see attached).</p> <p><i>This map shows the location where many hurricanes form.</i></p>	<p>Suppose a hurricane is on track to hit the island of Haiti. Can you think of a way to help someone quickly locate Haiti on the map?</p> <p><i>Use the numbers along the bottom and side of the map. Haiti is near the intersection of 74 and 22.</i></p> <p>A hurricane is projected to hit at the point (78, 18). What country should make hurricane preparations?</p> <p><i>Jamaica</i></p>	<p>Students will examine the hurricane map and look for ways to describe the location of various places.</p> <p>Selected students come to the overhead and tell the class a point or a country where a hurricane is projected to hit. The class will respond with the corresponding country or point.</p>

	<p>On this map, the numbers along the bottom of the map and the numbers along the side are different. Why do you think this is? <i>If the numbers were the same, we might get them mixed up</i></p> <p>Could we still use this same system to locate points on a map if the numbers along the bottom and along the side were the same? Why or why not? <i>We could, but only if we had a way to know which number corresponds to the bottom and which number corresponds to the side.</i></p>	
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<b>EXPLORATION</b>		
<b>What the Teacher Will Do</b>	<b>Eliciting Questions/ Student Responses</b>	<b>What the Students Will Do</b>
<p>The teacher will provide each student with a communicator, a dry erase marker, an eraser, and copy of a coordinate plane with the 1<sup>st</sup> quadrant only on one side and the other side will be blank (see attached). The teacher will display the same coordinate plane on a transparency.</p> <p><i>A coordinate plane helps us locate point just like we did on our hurricane map.</i></p>	<p>There are no numbers on our coordinate plane. How could we still locate a specific point?</p>	

<p>On a coordinate plane, there is a special starting location called the origin. The origin is represented by the ordered pair (0,0).</p> <p>The teacher will make connections between the students' answers and the formal vocabulary (x-axis, y-axis, x-coordinate, y-coordinate) and the rules for the order of an ordered pair.</p>	<p><i>We could write in our own numbers.</i></p> <p>Earlier we talked about how our hurricane map had different numbers along the bottom than along the side. On our coordinate plane, the numbers are the same. How can we tell them apart?  <i>Give them different names</i>  <i>By the order, always write the numbers along the bottom first</i></p>	<p>On the hand-out of the coordinate plane, students will number along the x and y-axis starting with zero at the origin.</p> <p>Students will brainstorm solutions to keep from getting x-coordinates and y-coordinates confused.</p> <p>Students will label important parts of the coordinate plane on their hand-out as the teacher explains them.</p>
<p>The teacher will graph the following points on the overhead one at a time:</p> <p>(2,5)  5,2)  (1,3)  (4,0)  (0,2)</p> <p>The teacher will check for individual student's understanding by seeing what they students write on their communicators.</p>	<p>How did you get your answer?</p> <p>Which number is the x-coordinate?</p> <p>Which number is the y-coordinate?</p> <p>Does order matter when graphing ordered pairs?  Yes</p> <p>Is the point (2,5) the same as (5,2)? Why or why not?  <i>No; in the ordered pair (2,5) the 2 is the x-coordinate,</i></p>	<p>Students will insert their coordinate plane hand-out into their communicators. Students will write down the ordered pair which corresponds to the point graphed on the overhead. Students should also label the x-coordinate and the y-coordinate.</p> <p>After <b>each</b> ordered pair, the students will raise their communicators to show what they have written.</p>

	<i>but in the ordered pair (5,2) the 2 is the y-coordinate</i>	
<p>The teacher will write a series of ordered pairs on the overhead projector.</p> <p>(4,5) (2,1) (7,3) (3,7) (0,6) (8,0)</p>	<p>Where is the origin? <i>At (0,0)</i></p> <p>How do you locate a specific point on the map? <i>The x-coordinate tells you how far along the x-axis to move; the y-coordinate tells you how far along the y-axis to move; a specific point is located at the intersection of both</i></p> <p>Does order matter when graphing ordered pairs? Yes</p> <p>Is the point (7,3) the same as (3,7)? Why or why not? <i>No; in the ordered pair (7,3) the 7 is the x-coordinate, but in the ordered pair (3,7) the 7 is the y-coordinate</i></p>	<p>Students will plot and label the points on their coordinate plane.</p>

<b>EXPLANATION</b>		
<b>What the Teacher Will Do</b>	<b>Eliciting Questions/ Student Responses</b>	<b>What the Students Will Do</b>
<p>Divide the class into groups of 4.</p> <p>Assign 1/3 of the groups to each task.</p> <p>Facilitate each groups presentation of their poster.</p>		<p>In groups, students will create and present a poster about one of the following topics:</p> <p>1. Create and present a poster that shows an explanation and picture of the following vocabulary: x-axis, y-axis, ordered pair, origin, x-coordinate, y-</p>

		<p>coordinate</p> <p>2. List and explain the steps to plot a point on a coordinate plane. Include a diagram.</p> <p>3. List and explain the steps to name a point on a coordinate plane. Include a diagram.</p>
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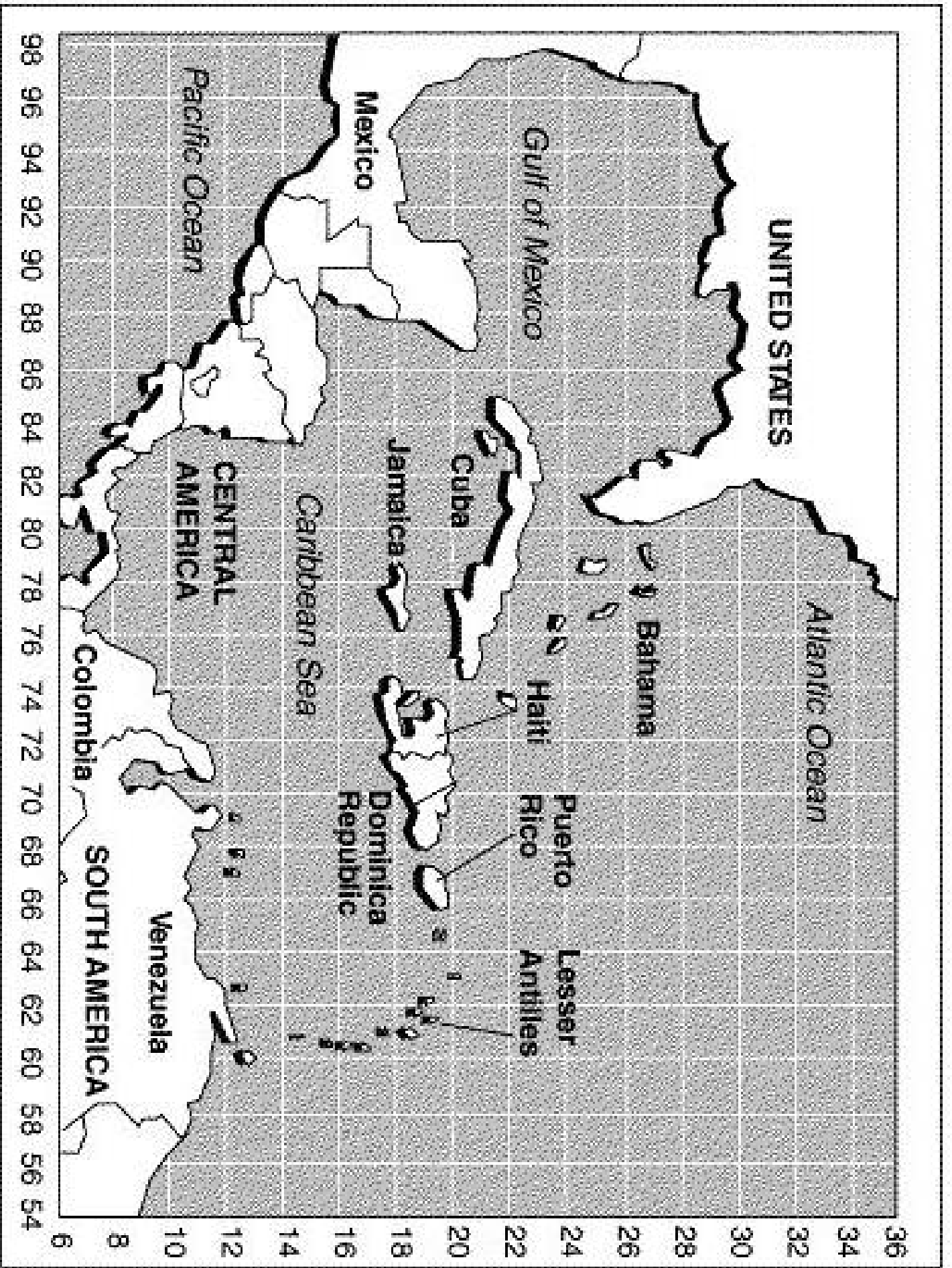
<b>TRANSITION</b>
In the previous activity you learned the parts of a coordinate plane, and you have learned how to plot and name ordered pairs. In the following activity you will plot points and connect them to find a hidden picture.

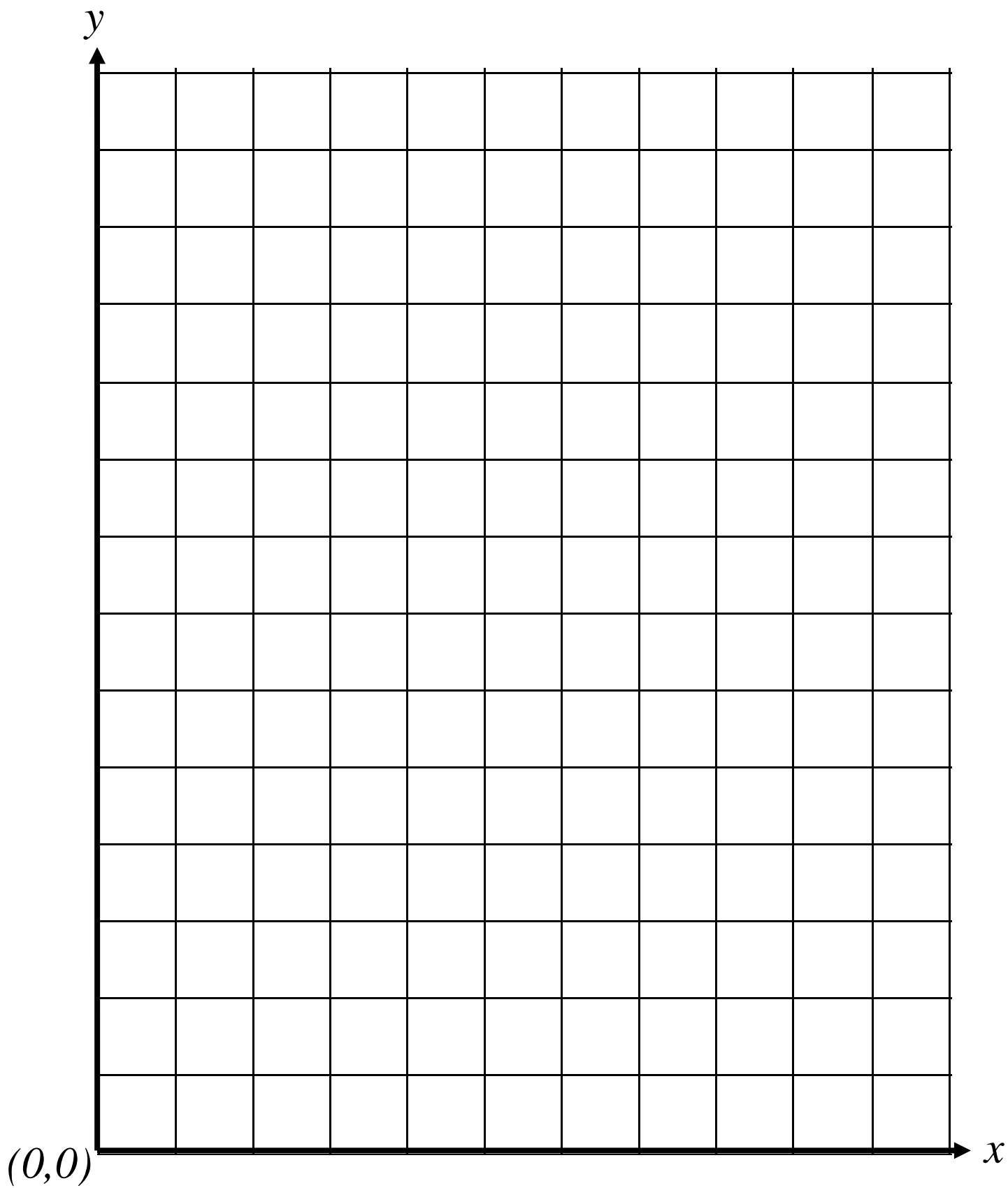
<b>ELABORATION</b>		
<b>What the Teacher Will Do</b>	<b>Eliciting Questions/ Student Responses</b>	<b>What the Students Will Do</b>
<p>The teacher will hand out the “Hidden Picture” Activity Sheet.</p> <p>The teacher monitor student progress; make sure students connect each point as they plot it. If students wait until they have plotted all the points, they may have trouble connecting them correctly.</p>		<p>Students will plot the points from the “Hidden Picture” Activity Sheet onto a coordinate plane. Students should use the coordinate plane from inside their communicators.</p>

<b>TRANSITION</b>
Now let’s see how much you have learned.

## **EVALUATION**

**An evaluation instrument is to be created. It should have at least 3 questions. Identify one lesson objective that matches each question.**





Name:

## Hidden Picture Activity Sheet

Plot the ordered pairs and connect the points in order.

Connect each point as you go. Don't wait until the end to connect all the points.

(10, 7)

(9, 6)

(7, 5)

(4, 5)

(3, 7)

(0, 4)

(1, 7)

(0, 10)

(3, 7)

(4, 9)

(7, 9)

(9, 8)

(10, 7)

Draw in a point for an eye. Write the ordered pair that represents your eye here: \_\_\_\_\_