LESSON PLAN MATH

Grade 5	
Item	**Page**
Lesson Plan	Page 2
Student Activity Handout 1	Page 5

Marlins: Fifth Grade Math Lesson Plan

<table>
<tr><td rowspan="3">VISION-SETTING</td><td colspan="2">OBJECTIVE.
What is your objective?</td><td>KEY POINTS.
What knowledge and skills are embedded in the objective?</td></tr>
<tr><td colspan="2">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).

SWBAT graph points on a coordinate system</td><td>A coordinate system is made up of 2 perpendicular number lines, called axes. The vertical axis is called the y axis, the horizontal axis is called the x axis.
The intersection of the axes (the origin) coincides with the 0 on each line and can be represented with the coordinate pair (0,0).
The first number of an ordered pair 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).</td></tr>
</table>

ASSESSMENT.
Describe, briefly, what students will do to show you that they have mastered (or made progress toward) the objective.

Students will graph ordered pairs on a sheet of graph paper and draw lines between points in order to create a Miami Marlins inspired image.

<table>
<tr><td rowspan="4">DETERMINING METHODS</td><td>OPENING (10 min.)
How will you communicate *what* is about to happen? How will you communicate *how* it will happen?
How will you communicate its *importance*? How will you communicate *connections* to previous lessons?
How will you engage students and capture their interest?</td><td>MATERIALS.</td></tr>
<tr><td>Pass out graph paper. Ask students to draw a numberline at the center of their graph paper that moves horizontally. Tell students that their numberline should start at 0 and stop at 20 and should count by ones. Ask students to label the numbers on their numberline. Now as students to draw a perpendicular line that starts at the 0 on the numberline and moves up 20 boxes. Explain that this is a second numberline, but instead of moving from left to right it will move up. Tell students to begin at 0 (where the two numberlines intersect) and number their vertical numberline all the way to 20. Tell students that this is the basics of graphing, a math skill that they will need to learn for higher level math like calculus and geometry.</td><td>Graph paper</td></tr>
<tr><td colspan="2">INTRODUCTION OF NEW MATERIAL (15 min.)
How will you explain/demonstrate all knowledge/skills required of the objective, so that students begin to actively internalize key points?
Which potential misunderstandings do you anticipate? How will you proactively mitigate them? How will students interact with the material?</td></tr>
</table>

Ask students to put their graph paper to the side. Today we are going to learn how to graph on a coordinate system. A coordinate system is made up of 2 perpendicular numberlines like the ones you just drew. A coordinate system might extend to negative numbers like this (draw) or might only include positive numbers (draw). The coordinate systems we are working with today will only include positive numbers. We call the numberlines on a coordinate system axes. The horizontal numberline is called the x-axis and the vertical line is called the y-axis. The place where the two axes intersect is called the origin. The origin always falls at 0 on the x-axis and 0 on the y-axis, or (0,0). This parenthetical notation is used to represent points on a coordinate system. Each point is defined by two numbers that are separated by a comma. The first number indicates how far to travel from the origin (0) in the direction of the x-axis (right). We call the first number the x-coordinate. The second number indicates how far to travel in the direction of the y-axis (up), so we call it the y-coordinate. I can graph a point on my coordinate system according to the directions given to me by these numbers. So, if I wanted to graph the point (2, 4), I would start at the origin and move over 2 along the x-axis (since 2 is the x-coordinate) and up 4 along the y-axis (since 4 is the y-coordinate). Then, I would mark my point on the coordinate system like this.	Chart paper (or White Board) and markers

We're going to practice graphing points on the coordinate systems you've already drawn. To begin, find the point (2, 4) on your graph like I just did on mine. Remember, since 2 is the x-coordinate, we will go over 2 on the x-axis. Since 4 is the y-coordinate, we will go up 4 on the y-axis. Label your point on your coordinate system using the correct notation (2, 4). Now, let's find the point (3, 10). Start at the origin. First, we move over 3 on the x-axis, and then we count up 10 on the y-axis. Label the point. Now, let's mark the point (12, 6). Ask student to explain how to find that point. Then ask students to label the point on their graph. Repeat with points: (5, 5), (9, 0), (15, 10), and (0, 20). Ask students to describe the process of graphing points on their coordinate system. Ask students: What are potential mistakes that you could make if you are not being careful? (Possible answer: Some students might move up first and then over by confusing the x and y coordinates.)	Paper, pencils

	I'm going to give you a new sheet of graph paper now with the axes already numbered. You are going to need to find 10 points on the coordinate system on your paper. By connecting the consecutive points with a ruler and straight line, your points will create an image inspired by the Miami Marlins. When you're finished, color the interior of the image. Complete labeling your X and Y on the vertical axis. Graph the points from the second page on your coordinate plane and connect consecutive points with a straight line to form a picture. (-9,3) (-7,5) (-4,6) (0,9) (1,5) (5,4) (8,6) (6,3) (8,0) (5,2) (-1,-1) (-5,-1) (-9,3) End of Sequence (-5,2) (2,2) (-2,1) (-5,2) End of Sequence (-6,4) (-6,4.5) (-5.5,4) (-6,4) End of Sequence (-9,3) (-6,3) End of Sequence	Student activity, ruler, pencil.
	Lesson Assessment: Once students have had an opportunity to practice independently, how will they attempt to demonstrate mastery of the knowledge/skills required of the objective?	
	Students will hold up their work and describe the shape that they made on their paper (a fish). Tell students that you are going to read out some coordinate pairs. They will need to find the points that you describe on their coordinate systems and tell you if the point is inside the colored shape on their paper (a fish) or outside the shape.	
	CLOSING (5 min.) How will students summarize and state the significance of what they learned?	
	Remind students that the skill they learned today will be useful to them in higher level mathematics like geometry and calculus. Ask students to describe what they did today to a partner.	

Fifth Grade – Math
Activity: Graphing on a Coordinate System

Complete labeling your X and Y on the vertical axis. Graph the points from the second page on your coordinate plane and connect consecutive points with a straight line to form a picture.

-9 -8 -7 -6 -5 -4 -3 -2 -1   1   2   3   4   5   6   7   8   9
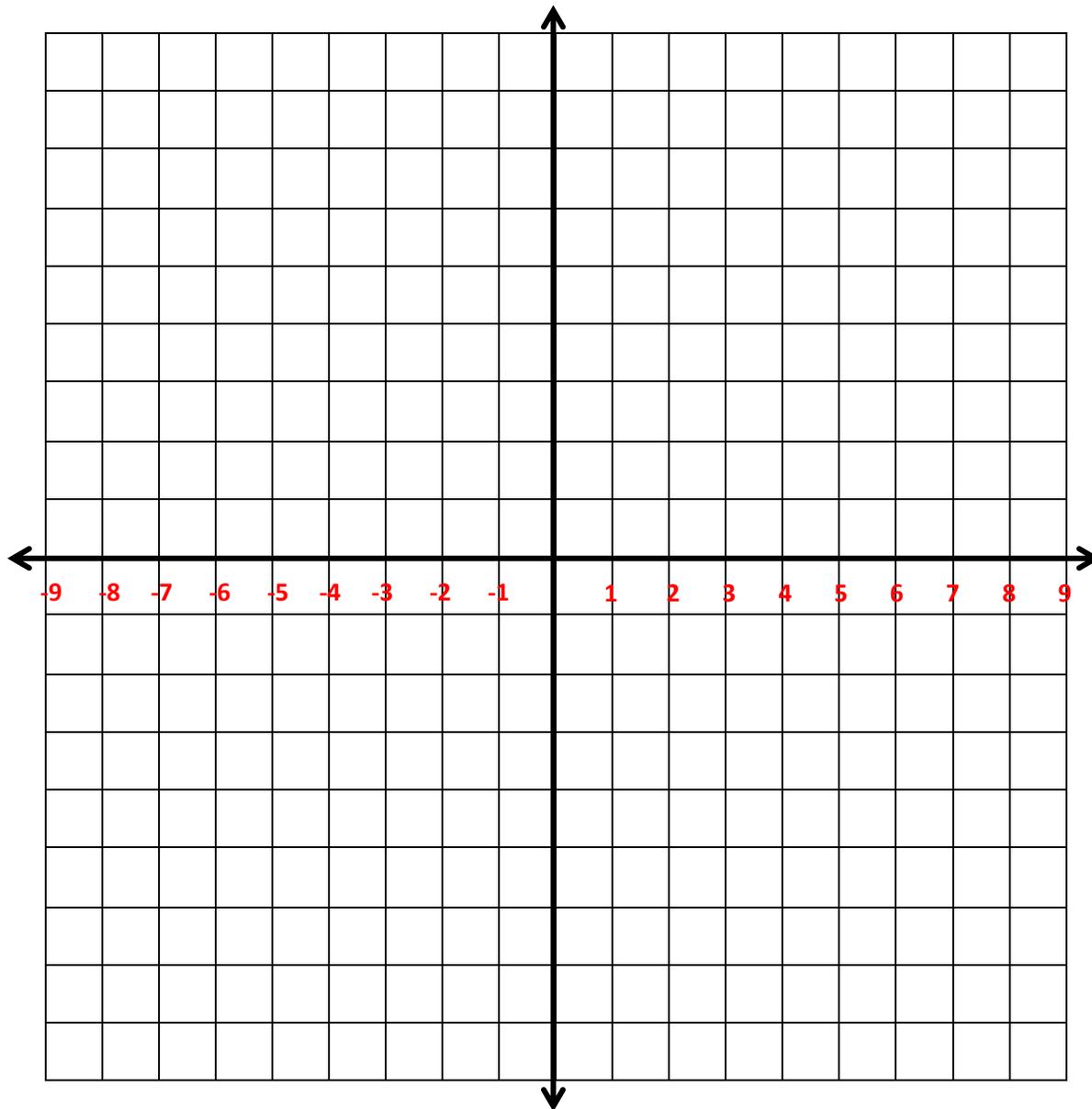
Coordinate Points

(-9,3)	(-5,2)	(-6,4)	(-9,3)
(-7,5)	(2,2)	(-6,4.5)	(-6,3)
(-4,6)	(-2,1)	(-5.5,4)	End of Sequence
(0,9)	(-5,2)	(-6,4)	
(1,5)	End of Sequence	End of Sequence	
(5,4)			
(8,6)			
(6,3)			
(8,0)			
(5,2)			
(-1,-1)			
(-5,-1)			
(-9,3)			
End of Sequence			