Grade 4

Marlins: Fourth Grade Math Lesson Plan

VISION-SETTING

OBJECTIVE. What is your objective?	**KEY POINTS.** What knowledge and skills are embedded in the objective?
Apply area and perimeter formulas for rectangles in real world and mathematical problems (ex: find the width given the area of the flooring and the length)	• The area of a rectangle is equal to the length multiplied by the width (A = l x w) • A ratio can be used to describe the relationship between two sides of a rectangle (w/l) • Equivalent fractions can be used to draw rectangles that have the same ratio of width to length

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

Students will design a Miami Marlins banner with appropriate dimensions using a scale to resize the Marlins dugout.

DETERMINING METHODS

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?	**MATERIALS.**
Show students an image of the new Marlins Park from above and ask students to describe what they see using math vocabulary (square, rectangle, rhombus, parallelogram, etc.) Ask students if they have a prediction for what they are looking at. A dugout is a rectangular structure at the side of the baseball field where the players stay while not on the field. Ask student volunteer to point out the dug outs in the picture. Today we have a special assignment from Marlins Ed. They want us to help design a new Miami Marlins banner to place on top of the dug out, for fans to look at from above while they watch the game. Before we can design a banner for them, we're going to need to use some of our math skills.	Image/Video
INTRODUCTION OF NEW MATERIAL (5 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?	
We want to make sure that our banner is the correct size, so that it fits right on top of the dugout. The top of the dugout is a rectangle (draw on the board). The area of the dugout is 160 sq. feet, where area is equal to length multiplied by width (A = l x w). In this case, we know the value of "A," the area, but we do not yet know the length or the width. (Write on the board: 160 = l x w). Remember, our area was given in sq. ft., so our units for length and width will be ft.)	
GUIDED PRACTICE (15 min.) How will students practice all knowledge/skills required of the objective, with your support, such that they continue to internalize the key points? How will you ensure that students have multiple opportunities to practice, with exercises scaffolded from easy to hard?	

	Let's think for a moment about what the length and width of the dugout *could* be by writing down the factors of 160. Ask students to make a list of factors on their own paper. (160, 1; 80, 2; 40, 40; 20, 8; 16, 10) The Marlins say that the ratio of the width to the length (w divided by l) is equal to 2/5. I can figure out the dimensions of the dugout by looking for a pair of factors that has this same ratio of width to length. We can write this ratio as w divided by l, or w/l. Let's look at one pair together, 16 and 10. In this instance, 16 can be either the length or the width—we will need to try both options. Let's say first that 16 is the length and 10 is the width. Thus, the ratio of width to length would be 10/16. Is 10/16 equal to 2/5? No. Okay, let's try another pair of factors. Repeat until students find the correct dimensions (length = 20 ft., width = 8 ft.) Our last task is to design a banner. Our banner is not going to be 20 ft. wide (that wouldn't fit on our paper). Graphic artists create designs using scaled models of buildings, which is what we are going to do today. So, how do we create a scaled model that represents the same ratio of width to length? Start by using the dimensions we have: 8/20 = 2/5. We can create an equivalent fraction by multiplying the numerator and denominator of the fraction 2/5 by the same number. For example, I might multiply the numerator and denominator of our fraction by 4. 2 x 4 = 8, 5 x 4 = 20. Therefore, our new width is 8, and our length is 20. I want my design to fit nicely on my chart paper, so I'm going to switch my units to inches instead of feet. I will use my ruler to draw a rectangle on the chart paper that is 8 in. by wide by 20 in. long. This size fits nicely on my chart paper. But it probably won't fit on yours. What might you try multiplying your numerator and denominator by to draw a rectangle that fits nicely on your graph paper? (Ex. 2, 3)	Chart paper, Rulers, Graph paper
	INDEPENDENT PRACTICE (25 min.) How will students independently practice the knowledge and skills required of the objective, such that they solidify their internalization of the key points prior to the lesson assessment?	
	Your job is to design a Miami Marlins banner on your graph paper. Your banner must be in the shape of a rectangle. The ratio of the width and length of your rectangle must be equivalent to 2/5, and your rectangle must fit entirely on your graph paper. Once you have drawn your rectangle correctly using a ruler, you must label the lengths of each side of the rectangle and then you may begin designing your banner. You will have 20 minutes to complete this assignment. While students work, you should monitor and check for understanding.	Rulers, Graph paper, colored pencils (optional)
	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?	
	1. The away team dugout at the Miami Marlins ballpark has an area of 120 sq. ft. (A = 120). List all of the possible lengths and widths for the away team dugout. 2. Select one possible combination of length and width (120 = l x w). What is the ratio of width to length (w/l) in the combination you chose? 3. Draw a scaled model rectangle that has a ratio of width to length that is equivalent to your answer to question 2.	
	CLOSING (5 min.) How will students summarize and state the significance of what they learned?	
	Students should share their lesson assessment and check for errors. If there are no errors, students should discuss how they could use equivalent fractions to make scale models of their bedrooms. If there is an error, students should look for mistakes.	

WORKSHEET MATH

Fourth Grade – Math

Activity: Area and Perimeter

1. The away team dugout at Marlins Park has an area of 120 sq. ft. (A = 120). List all of the possible lengths and widths for the away team dugout.

2. Select one possible combination of length and width (120 = l x w). What is the ratio of width to length (w/l) in the combination you chose?

3. Draw a scaled model rectangle that has a ratio of width to length that is equivalent to your answer to question 2.