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EDUCATION

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# Mississippi Mathematics Manipulatives Manual Featured Activity



## “Look Who’s Coming to Dinner” (Area & Perimeter)

4.MD.3

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As we continue our efforts to develop high-quality instructional materials (HQIM) and resources, the Mississippi Department of Education (MDE), through the Academic Education Office, would like to showcase instructional practices and activities that foster conceptual understanding through the use of manipulatives in the mathematics classroom.

The **Mississippi Mathematics Manipulatives Manual** features activities meant to serve as short, hands-on procedures that may be implemented before, during, or after a lesson to support the teaching and learning process of the Mississippi College- and Career-Readiness Standards (MCCRS) for Mathematics. Alignment with the MCCRS Scaffolding Document has been included for additional support. Teachers may contact staff at the MDE if they would like to borrow manipulatives for classroom use.

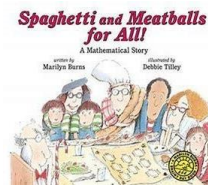
Teachers may modify these activities to meet the needs of the students they serve and their instructional delivery model (virtual, in-person, or hybrid).

Special Thanks:  
**Adrine Williams**  
**Jackson Public School District**

# Look Who's Coming to Dinner (Area & Perimeter)

## MANIPULATIVE(S):

- *Spaghetti and Meatballs for All* by Marilyn Burns
- Colored Tiles (or Didax Color Tiles Virtual Manipulatives. See the link in item #1 in the Activity section below.)



## GRADE LEVEL OR COURSE

### TITLE:

CCRS Mathematics Grade 4

### DOMAIN AND CLUSTER HEADING:

Measurement and Data (MD)

Solve problems using measurement and conversions of measurements from a larger unit to a smaller unit.

## STANDARD(S):

**4.MD.3:** Apply the area and perimeter formulas for rectangles in real world and mathematical problems. *For example, find the width of a rectangular room given the area of the flooring and the length, by viewing the area formula as a multiplication equation with an unknown factor.*

## PREREQUISITE SKILLS:

- Know how to recall basic multiplication facts.
- Know how to multiply whole numbers.
- Know area is the amount of two-dimensional space that is contained within a boundary.
- Know area is measured in square units.
- Know how to find the area of quadrilaterals by tiling and by using the formula  $A = l \times w$ .
- Know how to find the area of figures that are decomposable into rectangles.
- Know perimeter is the boundary of a two-dimensional shape.
- Know perimeter is measured in units of length.
- Know how to find the perimeter of figures by adding all side lengths together.
- Know opposite sides of a rectangle are equal.

## ACTIVITY:

**Note: Activity Sheet Attached**

1. Ensure students have eight colored tiles. (Based on availability of tools, students may be grouped in pairs or in groups no greater than four. If preferred, students can also access the Didax Color Tiles Virtual Manipulatives located at [www.didax.com/apps/color-tiles/](http://www.didax.com/apps/color-tiles/).)

2. Review with students how to find area and perimeter of a rectangle while modeling with colored tiles. Be sure to demonstrate that perimeter is found by finding the sum of the side lengths of each tile. Then, model finding the area by finding the sum of the units within the shape or by multiplying the length and width dimensions.
3. Have students demonstrate their understanding by creating a 2 x 2 model using their colored tiles. See Image 1.



Image 1

- a. Have students find the perimeter.
  - b. Have students find the area.
  - c. Ask students, “Why are the area and perimeter different? How different are they?”
4. Next, have students to spread their 4 colored tiles apart. See Image 2.
    - a. Have students find the sum of the perimeters of each unit square.
    - b. Have students find the sum of the areas of each unit square.
    - c. Ask students, “What changed, the area or the perimeter?” Then have students explain their reasoning.
  5. Read the book *Spaghetti and Meatballs for All* by Marilyn Burns.
  6. After reading the book, ask students, “Which measurement must equal the number of guests?” Students should answer, “**Perimeter.**” Then ask, “Which measurement equals the number of tables?” Students should answer, “**Area.**” Require students to explain their reasoning.
  7. Provide students with the Activity Sheet “An UnCOMFORTable Seating Arrangement” (attached).
  8. Have students create the given arrangement of the tables with their tiles and calculate how many people would be able to sit comfortably (one person per side length). Also, have students to find the collective perimeter and area of each seating arrangement.
  9. After students have completed the activity sheet, ask them, “Why was Mrs. Comfort so worried about guests changing her seating arrangement?” Have students share out their answers and discuss the change in seating (perimeter) based on the arrangement of tiles.
  10. Lastly, have students reflect on the changes, or lack thereof, to the area of each seating arrangement.

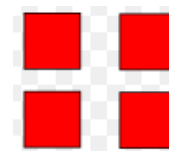


Image 2

### QUESTIONS TO CONSIDER:

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- For any arrangement, will the perimeter remain the same if the area is unchanged?
- What happens to the perimeter when the tiles are connecting?

### RESOURCES:

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- [Mississippi Mathematics Scaffolding Document](#) (Grade 4, Pages 35-36)
- [2016 MCCRS for Mathematics](#)
- [Spaghetti and Meatballs for All](#) by Marilyn Burns
- [Original Lesson Version](#)– Betterlesson.com-by Megan McCall
- [Math and Literature Booklist](#)

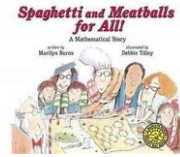
**Optional:** The University of Mississippi's Center for Mathematics and Science Education has an extensive inventory of math (and science and technology) tools and manipulatives that teachers may borrow for classroom use at no charge. Click the link below to access the inventory list and complete a check-out request.

- [CMSE Manipulatives](#)

### BEYOND THE ACTIVITY:

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- **Assessment:** Write a problem that proves or disproves the statement "All shapes with the same area also have the same perimeter."
- **Extension:** Ask students to create a seating arrangement (using tiles or by drawing squares) where all 32 guests in the story could have sat together. **Note:** For this activity, students are not limited to 8 tiles.



# Activity Sheet

## An UnCOMFORTable Seating Arrangement

Directions: Use your colored tiles to calculate how many people can sit comfortably in each seating chart provided below. Then, find the collective perimeter and area of the tiles in the seating chart.

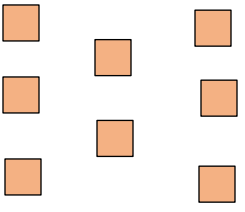
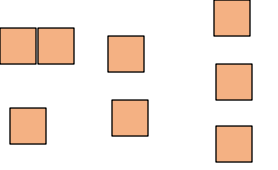
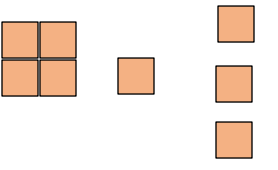
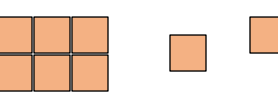
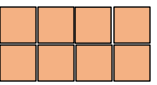
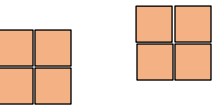


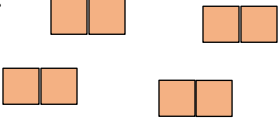
Table Arrangement	Seats How Many?	Perimeter	Area
1. 			
2. 			
3. 			
4. 			
5. 			
6. 			

Table Arrangement	Seats How Many?	Perimeter	Area
7. 			
8. 			
9. 			

**Why was Mrs. Comfort so worried about guests changing her seating arrangement?**

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