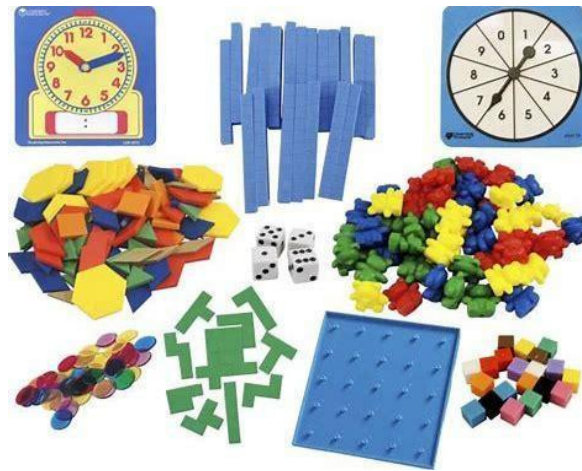




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Mississippi Mathematics Manipulatives Manual Featured Activity



“Pool Party”

8.F.1

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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.

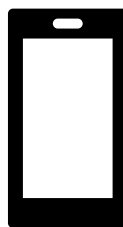
Teachers may modify these activities to meet the needs of the students they serve and their instructional delivery model (virtual, in-person, or hybrid).

[Special Thanks:](#)
Courtney Jones, Ed.S.,
Jackson Public School District

Pool Party

MANIPULATIVE(S):

- Computer Device (Tablet, PC, Smartphone)
- Desmos Graphing Calculator



GRADE LEVEL OR COURSE

TITLE:

CCR Mathematics Grade 8

DOMAIN AND CLUSTER HEADING:

Functions (F):

Define, evaluate, and compare functions

STANDARD(S):

8.F.1: Understand that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input and the corresponding output.¹

¹ Function notation is not required in Grade 8.

PREREQUISITE SKILLS:

- Know input is the number or piece of data that is put into a function.
- Know output is the number or piece of data that is the result of an input of a function.
- Know a rule is a summary of a predictable relationship that tells how to find the value of a variable.
- Know this standard extends the understanding of constant rate.
- Know how to reason abstractly and quantitatively.
- Know the parts of the coordinate plane.

ACTIVITY:

Note: Activity Sheet Attached

1. Begin the activity by prompting a brief whole group discussion with students about how to determine if a relation is a function.
2. Next, distribute the Pool Party Activity Sheet and read the first scenario aloud. (**Note:** The teacher may want to allow students an opportunity to re-read the scenario, if necessary.)
3. Allow students to respond to the “Think it Out” portion following Item #1.
 - a. Openly discuss/define the data in the scenario.
 - b. Then demonstrate how to define a function using the input and output data in the scenario. (**Note:** Since the input and output data is non-numerical, guide students in thinking abstractly and discussing how to view the problem.)
4. At this time, allow students to partner with others to determine the input and output values and complete *Figure 1*.
5. Once all students have an opportunity to complete *Figure 1*, review and discuss student answers to ensure all students are correct and ready to move to item # 3.
6. Allow students time to answer item #3.
7. Once all students have answered, discuss responses for Item #3 to make certain students can determine functions from non-numerical data.
8. Allow students/groups to work independently to complete items #4 and #5.
9. Once all students have complete step 8, allow all students to contribute to the discussion of Item #6 aloud. While discussion is taking place, travel the room to make certain students are appropriately listing their ordered pairs.
10. Allow students/groups to work through Items #7 to #12. Provide feedback on coordinates and graph labels.
11. Allow students to share out their ideas for Item #12.
12. Once done with item #12, have students to check their work. Provide time for students to gather electronic devices and navigate to <https://www.desmos.com/calculator>.
13. As students complete the “Let’s Check It” portion of the activity, travel the room to provide guidance and feedback as students convert their data and perform their check using Desmos.

QUESTIONS TO CONSIDER:

- Does the representation of a relation determine whether it is a function?
- How do we determine whether a relation is a function?
- Can we graph a relation that is not a function?
- Can we graph non-numerical data?
- Can we use the definition of a function to determine how things function in real-life?

RESOURCES:

- [Mississippi Mathematics Scaffolding Document](#) (Grade 8, Page 15)
- [2016 MCCRS for Mathematics](#)
- [Desmos Graphing Calculator](#)
- [Desmos Graphing Calculator MAAP Version](#)
- [Functions-Learn Desmos Tutorial](#)

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:

- **Extension(s):** This activity can train students on how to view daily functions. By examining “input” efforts, students can determine whether they get the desired “outputs”. In doing so, students begin to view how we function daily and how the efforts we input determine whether our lives may function as planned. Students are then equipped to create a non-numerical example of an important function in their lives.
- **Misconception(s):** Students may believe that Scenario 1 could not function since one guest is assigned to two graduates. They may not be able to determine that Scenario 1 can function if Scenario 2 was not provided.

Activity Sheets: Pool Party

Madison is headed to the ninth grade and her squad is set! Callie, Meg, Candace and Ty, her besties, have all been promoted and are ready to celebrate! Their parents have decided to host a pool party to celebrate their graduates. The girls are allowed to invite one other friend. Madison invited Scottie, Meg invited Charlotte, Callie invited Corie, and Candace invited Erin. Ty decided that she also wanted to invite Scottie. Can the graduation party still function if Ty and Madison invite the same guest?

Think It Out

1. Describe what a function represents.

2. Describe the input and output data for the graduation party. List the data below in the diagram below.

FIGURE 1

Squad Member	Input	Output
Madison		
Callie		
Meg		
Candace		
Ty		

3. Can the graduation party still function if Ty and Madison invite the same guest? Explain.

What if....

Scenario B: Candace and Meg decided to secretly invite additional guests. Candace invited Erin and Shun, and Meg invited Charlotte, Bo, and Kylie. Can the graduation party still function if Candace and Meg invite more than one guest?

Think It Out

4. Describe the input and output data for the graduation party including the additional guests. List the data in the diagram below.

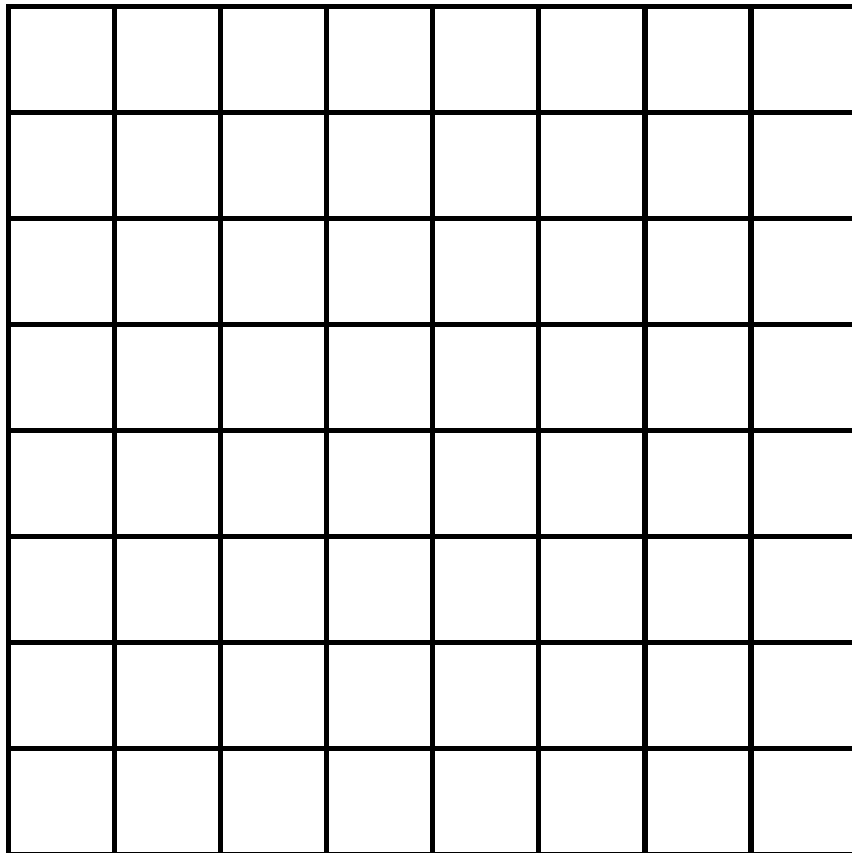
FIGURE 2

Squad Member	Input	Output
Madison		
Callie		
Meg		
Candace		
Ty		

5. Can the graduation party still function if Candace and Meg invite more than one guest? Explain.

6. Use the input and output data in Figure 1 to create ordered pairs as (graduate, guest). List them below.

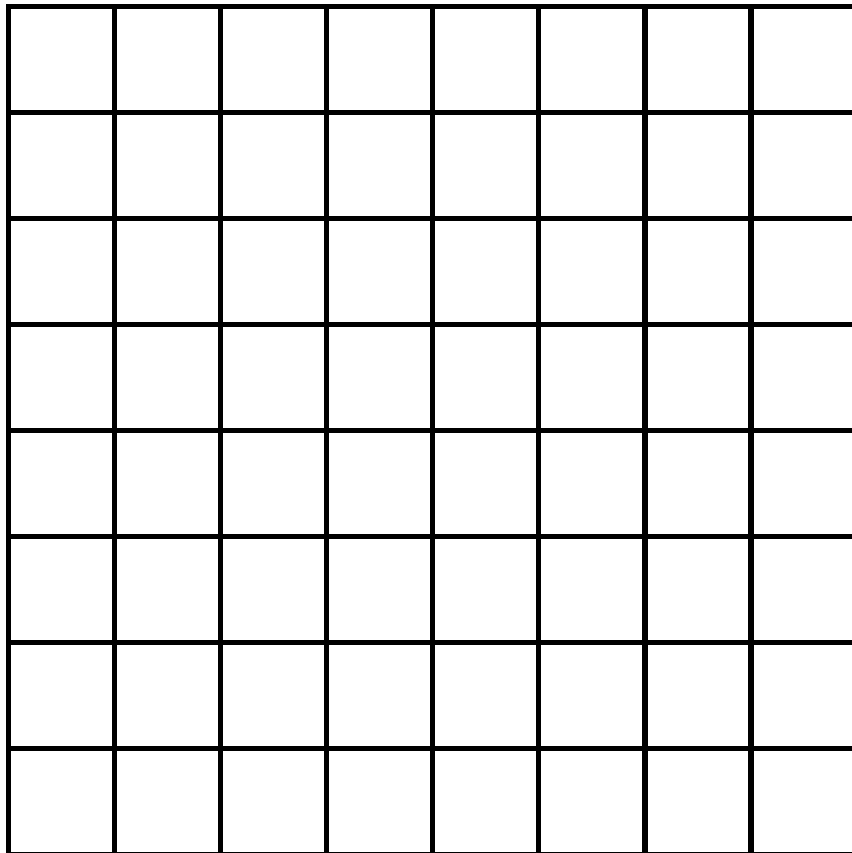
7. Graph each ordered pair in the coordinate plane below. Name each axis and label it with the appropriate names.



8. Does the graph of Figure 1 represent a function? Explain.

9. Use the input and output data in Figure 2 to create ordered pairs as (graduate, guest). List them below.

10. Graph each ordered pair in the coordinate plane below. Name each axis and label it with the appropriate names.



11. Does the graph of Figure 2 represent a function? Explain.

12. Does the representation of data determine whether or not it represents a function? Explain.
