MISSISSIPPI DEPARTMENT OF EDUCATION

Ensuring a bright future for every child

Mississippi Mathematics Manipulatives Manual

Featured Activity

"Coordinates"

(Based on the Book "*A Fly on the Ceiling: A Math Myth*," by Julie Glass)

5.G.2

Spring 2021

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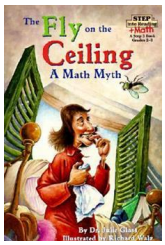
As we continue our efforts to develop high-quality instructional materials (HQIM) and resources, the Mississippi Department of Education (MDE), through the Academic Education Office, would like to showcase instructional practices and activities that foster conceptual understanding through the use of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

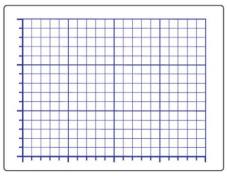
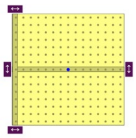
Teachers may modify these activities to meet the needs of the students they serve and their instructional delivery model (virtual, in-person, or hybrid).

Special Thanks:
Adrine Williams, MAT,
Jackson Public School District

Coordinates






MANIPULATIVE(S):

- *A Fly on the Ceiling: A Math Myth*
  -By Julie Glass
- Moveable XY Axis Geoboard, Pegboard
- Colored Pegs for Geoboard
- Dry or wet-erase markers

Alternative Manipulatives:

- Quadrant Dry-erase lapboard
- Graph paper
- Virtual Pegboard- Mathsbot

GRADE LEVEL OR COURSE TITLE:

CCR Mathematics Grade 5

DOMAIN AND CLUSTER HEADING:

Geometry (G):

Graph points on the coordinate plane to solve real-world and mathematical problems

STANDARD(S):

5.G.2: Represent real-world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation.

PREREQUISITE SKILLS:

- Know coordinate planes are created when two perpendicular lines cross, and a mathematical grid is placed upon them.
- Know these perpendicular lines are labeled as the x-axis and the y-axis.
- Know points within a plane can be located using an ordered pair which consists of an x-coordinate and a y-coordinate.
- Know movement begins at the origin, follows the x-axis first, and the y-axis second.

ACTIVITY:

Note: Activity Sheet Attached

1. Read the book *A Fly on the Ceiling: A Math Myth*-By Julie Glass. *(See the Resources section for a read aloud.)*
2. Distribute Moveable XY Axis Pegboards, pegs, and a wet erase marker to each student or small group of students.
3. In a whole group, review the parts of a coordinate plane. Have students follow along as you move the x-axis to the bottom and the y-axis to the far left, creating a first quadrant board.
4. Next, guide students through labeling the x and y-axes and numbering their grid, 0-10, using their wet erase marker.
5. In whole group, review with students how to plot a point using coordinate pairs. Have students to start at the origin, locate the x-value on the x-axis, from there locate the y-value on the y-axis and plot their point.
6. Repeat step five as necessary, until students have a grasp of the concept of plotting points.
7. In the book, Descartes practiced how to plot by watching the fly and recording where it landed. According to Descartes, the fly landed at four points: (2,5), (6,3), (4,7), and (8,1). Use these points to allow students to practice plotting on their own. Allow students to refer to the text when needed.
8. Provide each student or small group of students with the Activity Sheet.
9. Allow students time to plot the given points to locate Rene's things from the story using their pegs and pegboard.
10. Once all students have finished, have students take turns demonstrating how they found each point. Correct any misconceptions.

QUESTIONS TO CONSIDER:

- What is the origin or starting point when plotting points?
- Why do we need to start at the origin when plotting points?
- How do we know which coordinate to locate first?
- Where will the point lie if the x-coordinate is zero?
- Where will the point lie if the y-coordinate is zero?

RESOURCES:

- Mississippi Mathematics Scaffolding Document (Grade 5, Pages 60-61)
- 2016 MCCRS for Mathematics
- THE FLY ON THE CEILING: A Math Myth by Julie Glass & Richard Walz- YouTube- Ginny Baldwin
- Virtual Pegboard- Mathsbot
- 1cm graph paper- Mathdrill
- Graph paper generator- Math-Aides

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.

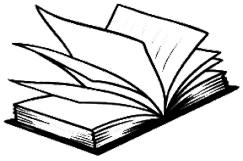
- CMSE Manipulatives

BEYOND THE ACTIVITY:

- **Accommodation(s):**
  - Allow students to work with a partner.
  - Provide a visual representation of key vocabulary terms for student reference.
- **Assessment(s):**
  - Have students to create images by plotting points within the first quadrant. This will allow students to practice and build automaticity in plotting points correctly.
  - Provide students with a coordinate grid with pre-plotted points in Quadrant 1. Have the students locate and list the ordered pairs for each pre-plotted point (generally identified by a picture or letter.) (*FREE Samples*: Coordinate Worksheets First Quadrant- Math Salamander)
- **Extension(s)**: Pose purposeful questions that connect previous math skills. *Example: Renae graphed a quadrilateral on a coordinate plane. The vertices of the quadrilateral are (1,1) (3,6), (6, 6), (8, 1). What quadrilateral does Renae draw when he connects the points? To further extend knowledge, contemplate the following: Renae graphs the points for the ordered pairs (4,6) and (4,9) on a coordinate plane. Then he connects the points to form a line segment. Is the line segment parallel to the x-axis or parallel to the y-axis?*
- **Misconception(s):** Students may assume that the order of the coordinate pair does not matter. Remind students that the first number should always be the x-value and involves moving horizontally along the x-axis. The second number is the y-value and involves moving vertically along the y-axis.

Activity Sheet: Rene's Things

Directions: Using the list below, locate Rene' Descartes's things on your coordinate grid.

Item	Image	Location
Boots		(4,4)
Star Book		(4,5)
Cactus		(3,8)
Hat		(6,7)
Aeolipile		(6,4)
Chamber pot		(5,2)
Ink		(1,6)