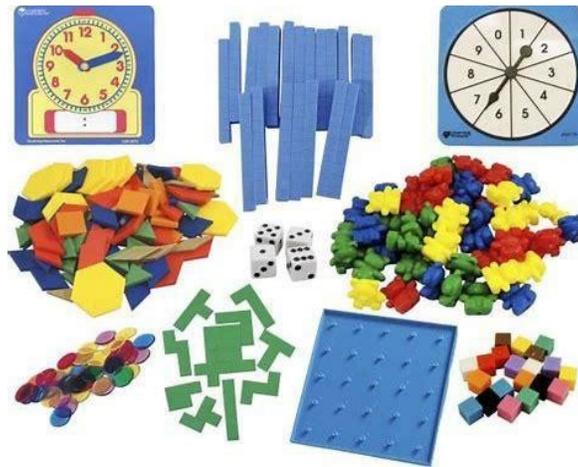




MISSISSIPPI
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Mississippi Mathematics Manipulatives Manual Featured Activity



“Exploring the Coordinate Plane”

5.G.1

Spring 2021

Carey M. Wright, Ed.D.
STATE SUPERINTENDENT OF EDUCATION

Nathan Oakley, Ph.D.
CHIEF ACADEMIC OFFICER

Marla Davis, Ph.D.
ACADEMIC LIAISON
Office of Academic Education

Wendy Clemons
EXECUTIVE DIRECTOR
Office of Secondary Education, Dropout Prevention, & Professional Development

Tammy Crosetti
STATE DIRECTOR OF CURRICULUM AND INSTRUCTION
Office of Secondary Education

Tommisha Johnson, Ed.S.
K-12 MATHEMATICS CONTENT DIRECTOR
Office of Secondary Education

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:
Rebecca A. Victor, MS,
Holmes County Consolidated School District

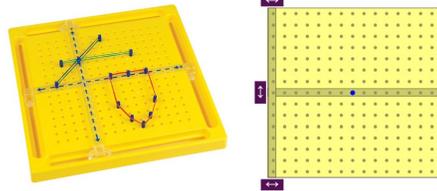
Exploring the Coordinate Plane

MANIPULATIVE(S):

- Moveable XY Axis Pegboard
- Colored Pegs

Alternative Manipulatives:

- [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.1: 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).

PREREQUISITE SKILLS:

- Know how to use a number line.
- Know basic geometric concepts of points, lines, line segments, rays, perpendicular lines, and parallel lines.
- Know two lines that cross at a 90-degree angle are perpendicular lines.
- Know the meaning of the words vertical and horizontal.

ACTIVITY:

1. In a whole group discussion, introduce the term coordinate grid and its related parts, such as the quadrants, X and Y axes, and the origin. **Note:** Teachers may also want to help student make the real-world connection of the coordinate grid and its relation to a map.
2. After the whole group discussion, provide each student with a Moveable XY Axis Pegboard and pegs. (See resources section for a virtual alternative.)
3. Have students to identify the X-axis (horizontal line). Then ask students to move the X-axis to bottom of the pegboard.
4. Next, have students to identify the Y-axis (vertical line). Then ask students to move the Y-axis to the far left. This will create a first quadrant board.

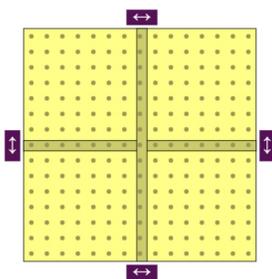


Figure 1: On the Moveable XY Pegboard, locate the X-axis and Y-axis.

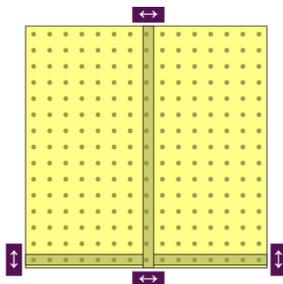


Figure 2: On the Moveable XY Pegboard, move the X-axis to the bottom.

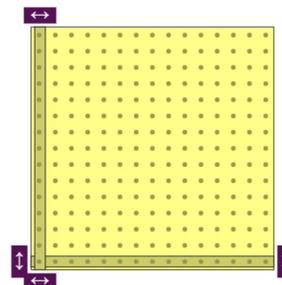


Figure 3: On the Moveable XY Pegboard, move the Y-axis to the far left.

5. Once all students have created their quadrant I pegboard, have students to place their hand on the board to identify the quadrant I space.
6. The teacher will discuss the properties of quadrant 1. *i.e.*, has both positive x and y values.
7. Next, in a whole group discussion, discuss coordinate pairs making sure to reference x -values and y -values, coordinate pair notation (x, y) , how they correspond with positions on the x and y axes, and the importance of “order” being the reason they are also referred to as “ordered pairs.”
8. After the discussion, have students to locate the origin of their board by placing a peg to identify where the origin point $(0,0)$ should be.
9. Now, model with students how to plot points within the first quadrant using coordinate pairs. Using points $(0,3)$, $(4,0)$, $(2,4)$, $(4,2)$, and $(3,7)$. For each point, have students identify the x -value and the y -value. Then, starting at the origin point, move “in order” to plot the point.
10. While modeling, have students to use their pegs to identify each point. Monitor the students work while modeling to clear up any misconception students may have.
11. Next, modeling whole group, place a peg on the board and have students to use what they know about the plotting process to identify the coordinate pair for the

pegged point. Repeat this step until students understand the concept of naming points.

12. At this time, place students in pairs. Have each student to place five pegs anywhere they would like to within the quadrant 1 space.
13. Lastly, have students to swap pegboards. Each partner will name the coordinate pair that corresponds with each pegged point.

QUESTIONS TO CONSIDER:

- Which is the horizontal axis? Which is the vertical axis?
- In an ordered pair (coordinate pair), to which axis does the first coordinate correspond? To which axis does the second coordinate correspond?
- What coordinate pair identifies the origin?
- Are the points (5,4) and (4,5) the same location? Explain.

RESOURCES:

- [Mississippi Mathematics Scaffolding Document](#) (Grade 5, Pages 58-59)
- [2016 MCCRS for Mathematics](#)
- [Virtual Pegboard](#)- Mathsbot

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:

- **Assessment(s):** This activity could be modified slightly to be used as an informal assessment by providing students with a list of coordinate pairs to plot, and pre-plotted points to name.
- **Extension(s):** Instead of leaving the horizontal axes all the way at the bottom, and the vertical axis all the way to the left, by moving the axes we can extend the lesson beyond the I quadrant to the other quadrants.