



MISSISSIPPI
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EDUCATION

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Mississippi Mathematics Manipulatives Manual Featured Activity



“How Far Away are You?”

8.G.8

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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:
Karin Bowen,
Rankin County School District

How Far Away are You?

MANIPULATIVE(S):

- Floor-sized coordinate grid
- Index cards
- Round dots
- String
- Tape



GRADE LEVEL OR COURSE

TITLE:

CCR Mathematics Grade 8

DOMAIN AND CLUSTER HEADING:

Geometry (G):

Understand and apply the Pythagorean Theorem

STANDARD(S):

8.G.8: Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.

PREREQUISITE SKILLS:

- Know legs are the sides of a right triangle that are adjacent to the right angle.
- Know the hypotenuse is the side of a right triangle that is opposite the right angle.
- Know the Pythagorean Theorem states that if a and b are the lengths of the legs of a right triangle and c is the length of the hypotenuse, then $a^2 + b^2 = c^2$.

ACTIVITY:

Note: Activity Sheet Attached

1. Prior to the start of class:
 - a. Tape off a large coordinate plane on the classroom floor. (**Note:** Suggested range of -8 to 8 on each axis.)
 - b. Place stickers, labeled A-F, on the coordinate plane. (**Note:** Be intentional about having at least one pair of stickers vertical, one pair horizontal, and the rest diagonal to one another.)
2. Begin the activity by having students work in pairs to find the distance between every point. (For example, the distance from A to B, A to C, A to D, A to E, and A to F, etc.)
3. Have students to use the Pythagorean Theorem, $a^2 + b^2 = c^2$, to determine the sides that they could not determine on their own.
4. Students can record their distances on the handout.

QUESTIONS TO CONSIDER:

- How do you find straight line distance or the hypotenuse?
- How do you find the distance between two points both located on the x-axis when one point is located to the left of zero and the other is located to the right of zero?
- When can finding straight line distance or the hypotenuse be helpful in real world application?

RESOURCES:

- [Mississippi Mathematics Scaffolding Document](#) (Grade 8, Page 29)
- [2016 MCCRS for Mathematics](#)
- [Virtual Graphing Calculator](#) – Desmos
- [Learn Desmos: Graphing](#) – Desmos
- [Pythagorean Theorem Calculator](#)- Desmos
- [How far is it? – Distance Calculator](#)- Real-world application

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):**
 - Consider predetermining and labeling coordinates that would provide a 'tilted' right triangle.
 - Consider leading students towards using the distance formula.
- **Misconception(s):** Students may confuse distance with slope and try to count 'up and over' and use this sum as the distance.

Activity Sheet

“How Far Away are You?”

Name(s) _____ and _____ Block _____

Directions: On the floor, I have used the tiles to form a coordinate grid. Each tile measures 1ft by 1ft. Find the distances between each of the points, round to the nearest hundredth and do not forget your labels!

On a scratch sheet of paper, you MUST show ALL OF YOUR WORK for at least 4 distances! This will be stapled to the back of this half sheet.

| | |
|-------------------|-------------------|
| $\overline{AB} =$ | $\overline{BE} =$ |
| $\overline{AC} =$ | $\overline{BF} =$ |
| $\overline{AD} =$ | $\overline{CD} =$ |
| $\overline{AE} =$ | $\overline{CE} =$ |
| $\overline{AF} =$ | $\overline{CF} =$ |
| $\overline{BC} =$ | $\overline{DE} =$ |
| $\overline{BD} =$ | $\overline{DF} =$ |
| | $\overline{EF} =$ |

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