



Mississippi Mathematics Manipulatives Manual Featured Activity



“Show Me the Money”

8.EE.8

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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:
Susan Jarvis, Ed.S.
Ocean Springs School District

Show Me the Money

MANIPULATIVE(S):

- US Coins (pennies, nickels, dimes, and quarters)
- Ziplock bag or clear contact paper



GRADE LEVEL OR COURSE

TITLE:

CCR Mathematics Grade 8

DOMAIN AND CLUSTER HEADING:

Expressions and Equations (EE):

Analyze and solve linear equations and pairs of simultaneous linear equations

STANDARD(S):

8.EE.8: Analyze and solve pairs of simultaneous linear equations.

8.EE.8a: Understand that solutions to a system of two linear equations in two variables correspond to points of intersection of their graphs, because points of intersection satisfy both equations simultaneously.

8.EE.8b: Solve systems of two linear equations in two variables algebraically and estimate solutions by graphing the equations. Solve simple cases by inspection. For example, $3x + 2y = 5$ and $3x + 2y = 6$ have no solution because $3x + 2y$ cannot simultaneously be 5 and 6.

8.EE.8c: Solve real-world and mathematical problems leading to two linear equations in two variables. For example, given coordinates for two pairs of points, determine whether the line through the first pair of points intersects the line through the second pair.

PREREQUISITE SKILLS:

1. Know a line represents the infinite number of solutions to a linear equation with two variables.
2. Know linear equations graph a straight line.
3. Know solutions of an equation are the values of the variables that make the equation true.
4. Know a system of linear equations is two or more linear equations that represent constraints on the variables used.
5. Know the point of intersection is the point where two lines intersect.
6. Know how to reason abstractly and quantitatively.
7. Know a system of linear equations is two or more linear equations that represent constraints on the variables used.
8. Know solutions of an equation are the values of the variables that make the equation true.
9. Know expressions in different forms can be equivalent.
10. Know coordinates are ordered pairs of numbers used to locate a point on a coordinate grid.

11. Know how to solve linear equations with one variable.
12. Know how to look for and make use of structure.
13. Know a line represents the infinite number of solutions to a linear equation with two variables.
14. Know the x-intercept is the point where the graph crosses the x-axis.
15. Know the y-intercept is the point where the graph crosses the y-axis.
16. Know coordinates are ordered pairs of numbers used to locate a point on a coordinate grid.
17. Know the slope is the ratio of the vertical change to the horizontal change between any two points on a line.
18. Know the slope formula: $m = (y_2 - y_1) / (x_2 - x_1)$.

ACTIVITY:

Note: Activity Sheet Attached

1. Tell students that today, they will be writing their own math problems using coins.
2. Students may work in groups of no more than 5 students. Provide each group with the *Coin Problem Activity Sheet* and a bag consisting of only two types of coins with 8-12 of each coin. (Example: 9 dimes and 12 quarters)
3. Have students to work together to create a problem using the directions on the sheet. Remind students the questions should include the following format.
You have (total amount of money) in (coin 1) and (coin 2). There are (total amount of coins) in all. How many of each coin do you have?
4. Remind students they should leave the part below the dotted line blank.
5. While students are working, circulate and make sure students are doing each part of the activity correctly, provide guidance where needed.
6. When student groups are done, take up the *Coin Problem Activity Sheet* and redistribute so that each group has a different problem.
7. Have the student groups solve the problem written by the previous group and record their work below the dotted line.
8. In whole group, discuss student problems, answers, and their strategies. Ask students what strategies they used. Probe to see if students reveal they used the “guess and check” method. Tell them that there is an algebraic method that can be more efficient than guessing and checking.
9. Next, select a student to write down two types of coins and tell you what they are. Write this on the board.
10. Ask the same student to pick a number of each coin (between three and ten) and to write those down but NOT to tell you those numbers.
11. Now ask the student to tell you the total monetary value of the coins combined and write this on the board.
12. Tell the students to think of ways to solve the problem and record their strategy on their own paper.
13. Once all students have recorded their answers, ask the student who created the problem if you (teacher) are correct. If they think you somehow cheated, ask someone else to make up another problem and repeat steps 10-13.

14. Following the activity, introduce students with systems of equations. (Ex: [Systems of Equations with Substitution: Coins](#)-Khan Academy and [System of Equations Application-Coin Problem](#)-Mathispower4u.)
- If class is coming to an end, do not tell them how you answered the question. Instead, tell them they will find out during the next class session. This is a great way to end class and to introduce systems of equations during the following class.

QUESTIONS TO CONSIDER:

- What questions would you ask if you could not see the money and needed someone to describe it for you?
- What two different kinds of information (total amount of coins and total value) are needed if you know the types of coins you have?

RESOURCES:

- [Mississippi Mathematics Scaffolding Document](#) (Grade 8, Page 12-14)
- [2016 MCCRS for Mathematics](#)
- [Money Pieces](#)- The Math Learning Center-Virtual Manipulative
- [Coins United States](#)- Toy Theater-Virtual Manipulative
- [Printable Coins](#)-Us-STEM sheets
- [Systems of Equations with Substitution: Coins](#)-Khan Academy (Example Video)
- [System of Equations Application-Coin Problem](#)-Mathispower4u (Example Video)

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):** Provide pennies and nickels for lower performing students. Review how to find the total value of an amount of coins may be needed. Provide guided question stems and anchor charts. Use of calculators to find total value is optional.
- **Extension(s):** Students could write items about pounds of two types of coffee and costs.

Student Names:

Activity Sheet

Coin Problem Sheet

A. Write the Problem Number on the packet here. _____

B. Set the stage for your word problem: Give a reason for the coins being counted. Who has the money and why are they counting it? Make your problem interesting! Then, write it on the lines below.

C. What are the 2 kinds of coins used in your problem?

D. How many coins are used in your problem?

E. What is the total value of your coins?

F. Ask a question/word problem about the coins on the line below.

-----Don't write below this line until your teacher tells you to-----

Next problem number : _____

Solution we think is right:
