MISSISSIPPI DEPARTMENT OF EDUCATION

Ensuring a bright future for every child

Mississippi Mathematics Manipulatives Manual

Featured Activity

“Pizza Parlor”

5.NF.1 & 5.NF.2

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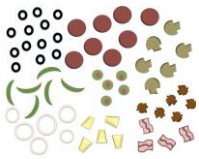
As we continue our efforts to develop high-quality instructional materials (HQIM) and resources, the Mississippi Department of Education (MDE), through the Academic Education Office, would like to showcase instructional practices and activities that foster conceptual understanding through the use of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

Pizza Parlor


MANIPULATIVE(S):

- Pizza Boxes
- Pizza Toppings *(See the "**Resources**" section below to access these items online or use colored construction paper. See Image 1 for a visual representation.)*
- Brown and yellow butcher paper

GRADE LEVEL OR COURSE TITLE:

CCR Mathematics Grade 5

DOMAIN AND CLUSTER HEADING:

Numbers and Operations-Fractions (NF):

Use equivalent fractions as a strategy to add and subtract fractions

STANDARD(S):

5.NF.1: Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators. *For example, 2/3 + 5/4 = 8/12 + 15/12 = 23/12. (In general, a/b + c/d = (ad + bc)/bd.)*

5.NF.2: Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers. *For example, recognize an incorrect result 2/5 + 1/2 = 3/7, by observing that 3/7 < 1/2.*

PREREQUISITE SKILLS:

- Know adding fractions is joining separate parts referring to the same whole.
- Know how to create an equivalent fraction for a given fraction using visual fraction models.
- Know how to find common denominators and create equivalent fractions to compare fractions.
- Know a unit fraction has a numerator of 1 and can be combined with other unit fractions with the same denominator.
- Know how to add or subtract mixed numbers with like denominators.
- Know how to solve word problems involving addition and subtraction of fractions with like denominators by using visual fraction models, equations, and a number line.
- Know how to use bar models, visual models, a number line, and equations to solve addition and subtraction problems involving fractions with like denominators and fractions with unlike denominators.
- Know how to compare fractions with like and unlike denominators.

QUESTIONS TO CONSIDER:

- What is a fraction?
- How do the students know when to add or subtract fractions when solving word problems?
- When comparing two fractions with unlike denominators, how do the students find the LCD?

RESOURCES:

- Mississippi Mathematics Scaffolding Document (Grade 5, Pages 20-23)
- 2016 MCCRS for Mathematics
- Mrs. Merry's Make a Pizza-Printable Pizza Cutouts

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:

- **Accommodations**: Provide a visual aid with step-by-step instructions
- **Extension:** Change each fraction in the problem to an improper fraction or mixed number and have the students work with adding and subtracting fractions with unlike denominators and converting between mixed numbers and improper fractions.

Activity Sheet

Pizza Parlor

Teacher Activity Guide

Standard and objectives:

5.NF.1 Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators.

5.NF.2 Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers.

TASK Description:
The students will find the least common denominator to create equivalent fractions to add and subtract fractions to solve a multi-step real-world contextual problem.

Sample Student Pizza:

Teacher Copy

Problem:
Kaden called to order pizza for his family. Most of the members of his family like sausage on their pizza so Kaden ordered 2/4 sausage. Kaden is the only one who likes pepperoni, so he ordered 1/6 pepperoni and bell pepper. His sisters like vegetable pizza, so he also ordered 3/12 mushroom, olives, tomatoes, and onions. How many slices are on the pizza? Will any part of the pizza be only cheese?

Workspace

The Students will first have to convert 2/4, 1/6, and 3/12 to fractions with like denominators.

Sausage	Pepperoni	Vegetable
2/4 x 3/3	1/6 x 2/2	3/12 x 1/1
6/12	2/12	3/12

The students should be able to determine the number of slices will be **12** based on the **least common denominator**. They can also determine that based on the **numerators**, **6** slices will have sausage on them, **2** slices will have pepperoni on them, and **3** slices will have the vegetable combination as stated in the problem.

Next, the students will add the parts 6/12, 2/12, and 3/12 to determine if the entire pizza has toppings and what part of the pizza is only cheese, having no additional toppings.

Add the given parts.	Subtract the parts from the whole.	Answer:
6/12 + 2/12 + 3/12 =11/12	12/12 - 11/12= 1/12	1/12 of the pizza is cheese

Solution:

_____

_____

a. Use the pizza provided to show how the pizza order will look when delivered to Kaden's family.
b. Explain how to find the fraction of the pizza that Kaden and his two sisters ate?

_____

_____

Student Name(s): _____

Problem:

Kaden called to order pizza for his family. Most of the members of his family like sausage on their pizza so Kaden ordered 2/4 sausage. Kaden is the only one who likes pepperoni, so he ordered 1/6 pepperoni and bell pepper. His sisters like vegetable pizza, so he also ordered 3/12 mushroom, olives, tomatoes, and onions. How many slices are on the pizza? Will any part of the pizza be only cheese?

Workspace

Solution:

_____

_____

a. Use the pizza provided to show how the pizza order will look when delivered to Kaden's family.

b. Explain how to find the fraction of the pizza that Kaden and his two sisters ate?

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