

# Algebra/Geometry Institute Summer 2010

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Grade Level: 4<sup>th</sup>



## Investigating Fraction Circles

### 1. Teaching objective(s)

- Student will add and subtraction fractions with like denominations. (Mississippi Math Curriculum Frameworks, 4<sup>th</sup> grade, 1e)

### 2. Instructional Activities:

- Ask students to tell something that they already know about fractions. Allow students to share with the class.
- Pass out fraction circles. Allow students to manipulate and examine the fraction circles.
- Have students to put the fraction circles into groups by their colors. Students should have eight circles.
- Have students count how many pieces make up each circle using the fractions circles.
- Beginning with the  $\frac{1}{2}$  circles, Have students to holds up one of the  $\frac{1}{2}$  fractions circle, ask students to tell what the top number is called, (lead them to say the numerator). Ask students what the bottom number is called, (lead them to say the denominator). Ask students what the line is called that is between the numerator and the denominator, (lead them to say the fraction bar). Write the words on the board like a fraction problem. (See Attachment 1)
- Tell students that there are two pieces that make up each  $\frac{1}{2}$  circle, have students identify the two  $\frac{1}{2}$  fraction circles by holding them in their hand. Then tell them that the two (2) is our denominator because it shows or tells how many pieces the circle is divided into. On the board, write the two beside the word denominator. (See Attachment 1)
- Have students put one piece of the  $\frac{1}{2}$  fraction circle down and keep one piece in their hand, ask them what they think the numerator is (lead them to say 1). Tell the students that the numerator is the part of the fraction that represents 1 out of 2 pieces that the circle is divided into. Ask them to name the fraction. ( $\frac{1}{2}$ ) On the board write the 1 on top of the 2, have students write what was demonstrated in their math folder/math journal.
- Allow students to practice naming the parts of a fraction by modeling, using their fraction circles and fraction problems. Write the fraction problems on the board. (See Attachment 2) Have the students draw the pieces of the fraction circles to model the fractions on the board. Walk around the classroom and observe students as they model the fraction problems, giving assistance when needed.

- After students practice naming the parts of a fraction, demonstrate using the overhead projector to add fractions with like denominators. (See Attachment 3) Have students demonstrate using their fraction circles adding fraction problems.
- Divide students into groups of 2. Let each student model a fraction with the same denominator. Have the student pairs add their fractions.
- Have several students go to the board and add more fractions with like denominators. Have students at their seat work the same problems from the board using their fraction circles.
- After students add several fraction problems. (See Attachment 5) Have them make up two fraction problems with the same denominators and add them to find the sum using their fraction circles. (Teacher will observe students as they work and give them feedback). Allow students to share with the class.
- Next, demonstrate on the overhead how to subtract fractions with like denominators. (See Attachment 4)
- Have several students use the overhead to model adding a fraction problem with the same denominator. Have students at their seat use their fraction circles to model the fraction from the overhead. Have students make up two fraction subtraction problems with like denominators, and find the product using their fraction circles. Allow students to share with the class.
- Have students write the two addition and the two subtraction fraction problems they made-up and modeled using the fraction circles on paper and turned in to be graded by the teacher as an assessment.
- To end the lesson, allow students to share something they each learned from the lesson.

### 3. **Materials and Resource(s):**

#### **Materials:**

Chalk/Erasable Markers

Board

Overhead Projector

Overhead Fraction Circles

Students' Math Journals/folder

Fraction Circles (A Set for each Student)

Board Demonstration of Parts of a Fraction (See Attachment 1)

Fraction Practice Problem (See Attachment 2)

Adding and Subtracting Fractions with like Denominators Example (See Attachment 3)

#### **Resources:**

Elementary and Middle School Mathematics: Teaching Developmentally; Third Edition;

John Van De Wall; 1997

[www.printables/PMathIntroducingFractionswithFractionCircles](http://www.printables/PMathIntroducingFractionswithFractionCircles); M. Burrell

### 4. **Assessment:**

Assessment will be made by the teacher from students' written responses from fraction problems they made-up and modeled using fraction circles.

Board Demonstration (Parts of a Fraction)

$$\begin{array}{ccccccc} \text{Numerator} & & 1 & & & & 1 \\ \hline & = & \text{fraction bar} & = & \hline & & 2 & & & & 2 \\ \text{Denominator} & & & & & & & & & & & \end{array}$$

Fractions Practice Examples

$\frac{2}{6}$        $\frac{3}{4}$        $\frac{2}{3}$        $\frac{2}{5}$

$\frac{5}{8}$        $\frac{2}{12}$        $\frac{6}{10}$        $\frac{3}{8}$

$\frac{3}{10}$        $\frac{1}{3}$        $\frac{1}{4}$        $\frac{5}{10}$

$\frac{2}{4}$        $\frac{3}{5}$        $\frac{2}{4}$        $\frac{1}{6}$

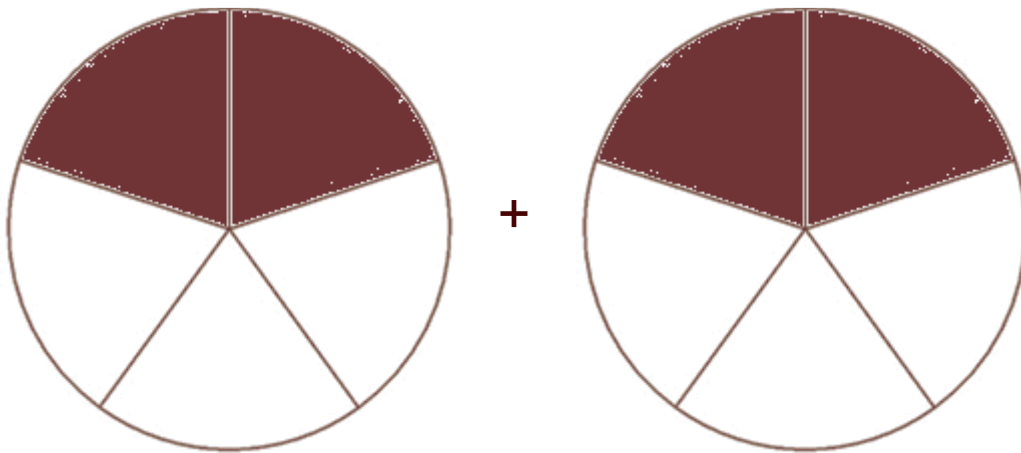
$\frac{7}{10}$        $\frac{1}{5}$        $\frac{5}{12}$        $\frac{5}{6}$

## Adding Fractions with like Denominators

Example:

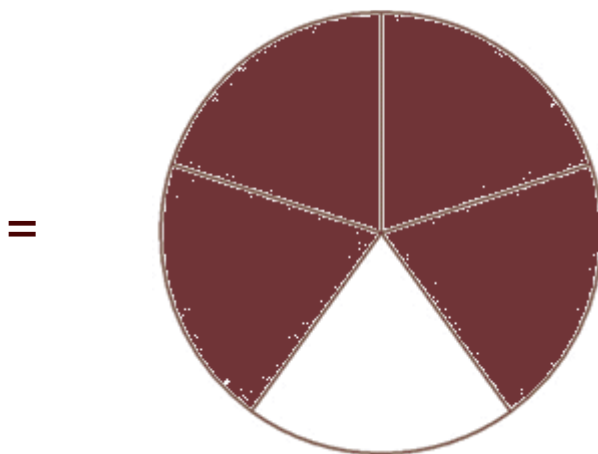
Adding Fractions:

$$\frac{2}{5} + \frac{2}{5} = \frac{4}{5}$$



Shade 2 out of the 5

Shade 2 out of the 5



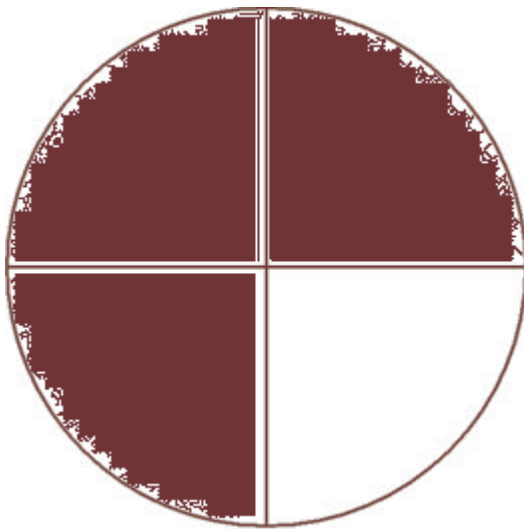
Shade 4 out of the 5

## Subtracting Fractions with like Denominators

Example:

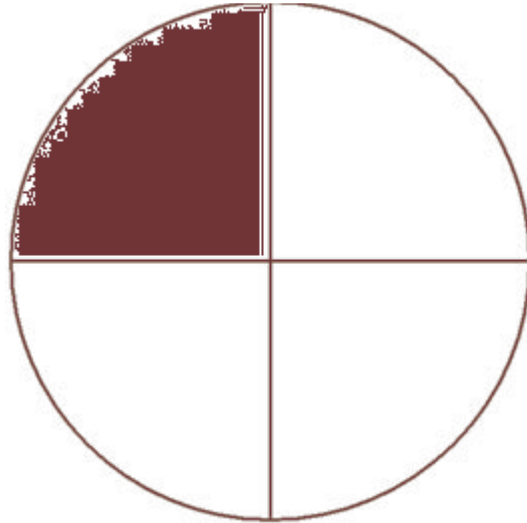
Subtracting Fractions:

$$\frac{3}{4} - \frac{1}{4} = \frac{2}{4}$$



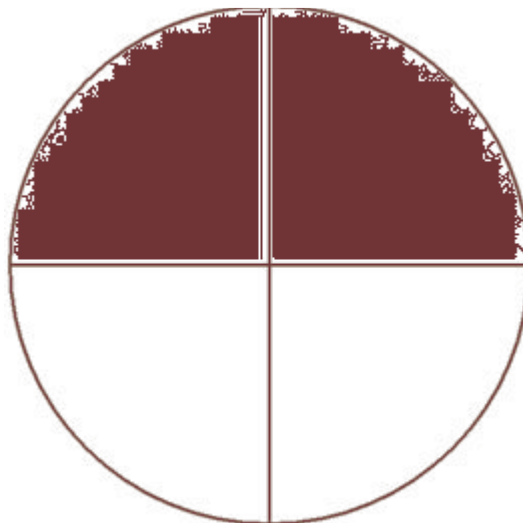
Shade 3 out of the 4

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Shade 1 out of the 4

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Shade 2 out of the 4

## Adding Fraction Problems

$\frac{3}{10} + \frac{2}{10}$	$\frac{1}{5} + \frac{3}{5}$	$\frac{1}{4} + \frac{1}{4}$	$\frac{1}{3} + \frac{1}{3}$	$\frac{3}{9} + \frac{2}{9}$
$\frac{3}{6} + \frac{2}{6}$	$\frac{2}{5} + \frac{3}{5}$	$\frac{2}{4} + \frac{1}{4}$	$\frac{1}{5} + \frac{2}{5}$	$\frac{5}{12} + \frac{2}{12}$
$\frac{3}{6} + \frac{1}{6}$	$\frac{5}{10} + \frac{3}{10}$	$\frac{4}{8} + \frac{1}{8}$	$\frac{3}{4} + \frac{1}{4}$	$\frac{2}{9} + \frac{1}{9}$

## Subtracting Fraction Problems

$\frac{2}{10} - \frac{1}{10}$	$\frac{1}{5} - \frac{1}{5}$	$\frac{2}{4} - \frac{1}{4}$	$\frac{2}{3} - \frac{1}{3}$	$\frac{6}{9} - \frac{3}{9}$
$\frac{4}{6} - \frac{1}{6}$	$\frac{3}{5} - \frac{1}{5}$	$\frac{4}{5} - \frac{1}{5}$	$\frac{5}{8} - \frac{2}{8}$	$\frac{5}{10} - \frac{2}{10}$
$\frac{3}{6} - \frac{1}{6}$	$\frac{5}{12} - \frac{2}{12}$	$\frac{6}{8} - \frac{3}{8}$	$\frac{4}{9} - \frac{2}{9}$	$\frac{5}{6} - \frac{1}{6}$