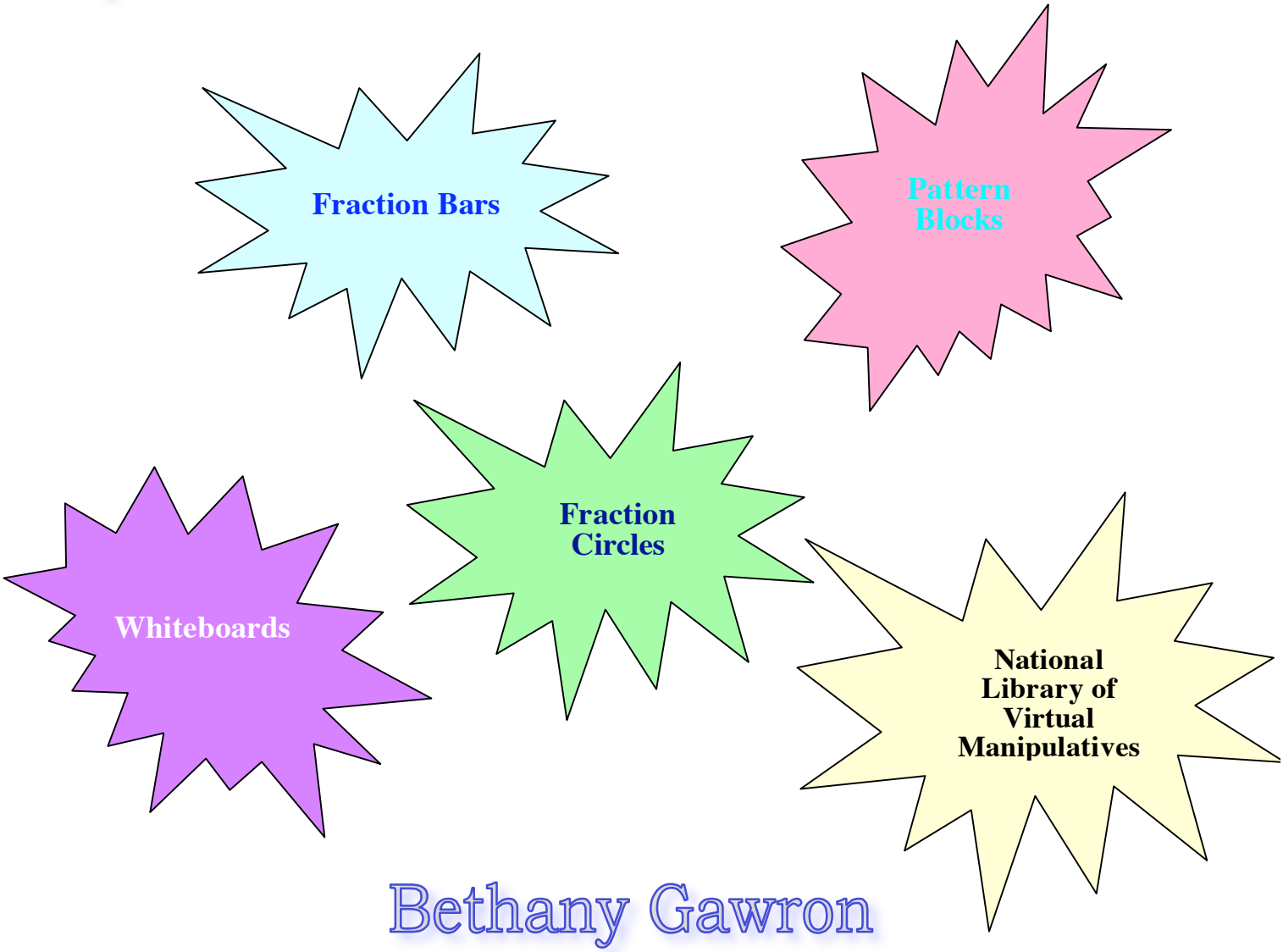
Fun with Fractions



Bethany Gawron

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Unit Objectives

- Students will observe that a fraction is a part of a whole.
- Students will find fractional parts of a whole.
- Students will manipulate fraction circles both on the computer and by hand to find equivalent fractions.
- Students will interact with computer technology to add fractions with unlike denominators.
- Students will manipulate fraction bars to subtract fractions with common (like) and unlike denominators.
- Students will observe that to add and subtract fractions with unlike denominators, there needs to be a common denominator between the fractions.
- Students will add and subtract fractions with unlike denominators with and without the aid of manipulatives.
- Students will manipulate a computer activity to observe what happens when fractions with unlike denominators are multiplied together.
- Students will manipulate pattern blocks to divide fractions with unlike denominators.
- Students will perform multiplication and division operations using fractions with unlike denominators.
- Students will observe that fractions can also be written as decimals.

Standards Covered

New York State Standards

Subject: Mathematics, Science, and Technology
Learning Standard 3: Mathematics (2005 update)
Grade/Subject: Grade 6
Area: Content Strands
Strand: Number Sense and Operations Strand
Standard: Students will understand meanings of operations and procedures, and how they relate to one another.

- **Performance Indicator:** 6.N.16 Add and subtract fractions with unlike denominators.
  - **Performance Indicator:** 6.N.17 Multiply and divide fractions with unlike denominators.
  - **Performance Indicator:** 6.N.18 Multiply and divide mixed numbers with unlike denominators.
  - **Performance Indicator:** 6.N.21 Find multiple representations of rational numbers (fractions, decimals, and percents 0 to 100).

USA- NCTM (Nat. Council of Teachers of Mathematics): Principles & Standards for School Mathematics

Area: Standards
Level: Grades 6–8
Topic: Number and Operations
Instructional program descriptor: Understand numbers, ways of representing numbers, relationships among numbers, and number systems

- **Expectation:** work flexibly with fractions, decimals, and percents to solve problems;
- **Expectation:** compare and order fractions, decimals, and percents efficiently and find their approximate locations on a ...

Instructional program descriptor: Understand meanings of operations and how they relate to one another

- **Expectation:** understand the meaning and effects of arithmetic operations with fractions, decimals, and integers;

Instructional program descriptor: Compute fluently and make reasonable estimates

- **Expectation:** select appropriate methods and tools for computing with fractions and decimals from among mental computation, estimation, calculators or computers, and paper and pencil, depending on the situation, and apply the selected methods

Materials & Equipment

- One large bag of M&M's (Skittles can be substituted for students who are allergic to M&M's) – these should be divided into individual bags that each have 20 M&M's each
- Small whiteboards
- Large whiteboards
- Dry erase markers & erasers
- Overhead projector
- Overhead markers
- Computers
- Computer access to National Library of Virtual Manipulatives (either through the internet or through the installation of the program on the computer)
- Sets of fraction circles – one for each student
- Overhead fraction circles
- "Finding Equivalent Fractions" worksheet – one per student
- "Equivalent Fractions" worksheet – one per student
- Writing utensils – pens, pencils, colored pencils
- Transparent fraction bars
- Fraction bars
- "Subtracting Fractions (with unlike denominators)" worksheet
- "Adding & Subtracting Fractions (with unlike denominators)" worksheet – one per student
- Sets of pattern blocks (including at least 4 yellow hexagons blocks, 6 red trapezoid blocks, 9 blue rhombus blocks, and 12 green triangle blocks) – enough for half of the class to use at the same time
- One set of overhead pattern blocks
- Transparent decimal squares – 10ths & 100ths
- "Expressing Fractions in Different Ways" worksheet – one per student
- "I Have, Who Has" fraction cards

Unit Overview

Day 1: M&M Fractions *(An Introductory Lesson)*
Students will use M&M's to discover that a fraction is a part of a whole. The students will participate in individual and partner work using whiteboards.

Day 2: Finding Equivalent Fractions
Using fraction circles and the computer, the students will participate in activities that allow them to find two or more fractions are equivalent.

Day 3: Adding & Subtracting Fractions (with unlike denominators)
Students will use the National Library of Virtual Manipulatives, as well as fraction bars, to discover to how to add and subtract fractions with unlike denominators.

Day 4: Multiplying & Dividing Fractions
Using pattern blocks and the National Library of Virtual Manipulatives, the students will participate in activities that allow them to discover how to multiply and divide fractions.

Day 4: From Fractions to Decimals
Through the use of decimal squares and the game "I Have, Who Has", students will discover that fractions can also be represented as decimals.

M&M Fractions

(An Introductory Lesson)

Objectives:

- Students will observe that a fraction is a part of a whole.
- Students will find fractional parts of a whole.

Materials:

- One large bag of M&M's (Skittles can be substituted for students who are allergic to M&M's) – these should be divided into individual bags that each have 20 M&M's
  - *Note: M&M "Fun Size" packages will not work for this lesson because each bag needs to have the same number of M&M's, which is not that case with "Fun Size" packages.*
- Small whiteboards – one for each student
- Large whiteboards – one for every two students
- Dry erase markers (one per student) & erasers
- Overhead projector
- Overhead markers

Standards:

Strand: Number Sense and Operations Strand
Standard: Students will understand meanings of operations and procedures, and how they relate to one another.

Anticipatory Set:

To get the students interested in the lesson the teacher will tell the students "The other day I order a pizza, which was cut into eight slices. My family and I ate some of the pizza, but not the whole pizza. We at a part of the whole pizza." The teacher should then ask something to the effect of "Can you think of a time during your week when you might see a part of a whole?" Let the students share their ideas.

Note: The idea of a fraction being a part of a whole will be reinforced in the closure of the activity. However, we want the students to come to this realization on his or her own. Therefore do not use the word fraction at this point in the lesson.

Procedure:

(1) Give each student a pre-made individual bag of M&M's.

(2) Tell the students to open the bag and count how many M&M's they have. Then, the students should divide their M&M's by color and count how many of each color they have.

(3) Using the form "some number" out of "some number", have the students figure out how many M&M's (out of 20) they have for each number and write this information on their whiteboards. For example, if the students have 4 red M&M's in their package, under red they should write 4 out of 20.

(4) With a partner, have the students figure out how many M&M's the class has as a whole. The students should use their large whiteboard to show how they figured this out. Allow the students to share how they figured this out. (20 M&M's times the number of students in the class).

(5) Using the overhead, or board, make a class count of how many M&M's of each color the class has as a whole.

(6) With a partner have the students write these numbers in the "some number" out of "some number" form. The students should write these numbers on their large white board. They should show their work. Have the students share how they figured out what numbers to write.

Closure:

(1) Ask if anyone knows what a fraction is. Before allowing the students to answer, have them discuss the idea with their partner. (*Use leading questions until the students make the observation that a fraction is a part of a whole and that their bag of M&M's has fractional parts. Do not just tell the students this. They need to make the connection on their own and in their own words.)*

(2) When the students have made this connection, have them find the fractional part of each color in their individual bag of M&M's.

(3) With their partner have them write the fractional part of each color of M&M's that the class has.

Note: The teacher can also take this time to make comparisons between different fractions. For example, ask students to identify which fractions are large or smaller than other fractions.

Homework:

No homework is given with this lesson.

Finding Equivalent Fractions

Objectives:

- Students will manipulate fraction circles both on the computer and by hand to find equivalent fractions.

Materials:

- Computer (for teacher use)
- Computer access to National Library of Virtual Manipulatives (either through the internet or through the installation of the program on the computer)
- Sets of fraction circles – one for each student
- Overhead fraction circles
- Overhead projector
- Overhead markers
- "Finding Equivalent Fractions" worksheets (one per student)
- Writing utensils – pens, pencils, colored pencils

Standards:

Standard: Students will understand meanings of operations and procedures, and how they relate to one another.
Performance Indicator: 6.N.21 Find multiple representations of rational numbers.

Anticipatory Set:

Using the National Library of Virtual Manipulatives, the teacher will find the "Fractions – Comparing" activity (which is found in Number Sense & Operations, Grades 6-8). The teacher will manipulate the given problem in the activity to show the students that two fractions can have different names, but be the same amount. (For example, 1/2 = 2/4)

Procedure:

(1) Give each student a set of fraction circles.

(2) Using the fraction circles for the overhead, the teacher should call out a fraction, place the fraction on the overhead (using the overhead manipulatives), and write the fraction on the overhead. Each student should use his or her manipulatives to find an equivalent fraction.

(3) After each fraction, allow the students to share all the equivalent fractions that they found. As the students share their findings, the teacher (or the students) should write the equivalent fractions on the overhead so that the fractions are all equal to each

other. For example, if the teacher says (and shows) 1/2, the following should be written on the overhead: 1/2 = 2/4 = 3/6 = 4/8 = 5/10 = 6/12

The following fractions should be used when completing steps 2 & 3:
- 2/8 = 1/4
- 1/3 = 2/6 = 4/12
- 4/6 = 2/3 = 8/12

(4) Using the manipulatives, the students should individually complete the "Finding Equivalent Fractions" worksheet.

Closure:

The teacher should gather the students together and ask the following questions:
- Look at problem #1 on the worksheet you just completed. Do you notice anything about the fractions in that problem? *(The students should notice that when you multiple or divide the top and bottom number by the same number you get a fraction that is equivalent to the original.)*
- Does this work for all fractions? Can you share an example with us?
- If I gave you the fraction 8/32 could you find at least 3 equivalent fractions? Find them. *(Allow students to share some of the equivalent fractions they found with the class. As the students share, have them explain how they found that particular equivalent fraction.)*

Homework:

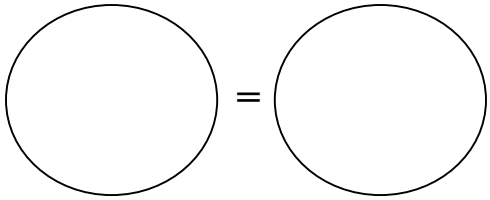
The students will complete a worksheet, "Equivalent Fractions", without the aid of manipulatives. *Note: If there are students in the class that have special learning needs, consider allowing these students to complete the homework with the aid of the fraction bars and/or computer.*

Name _____

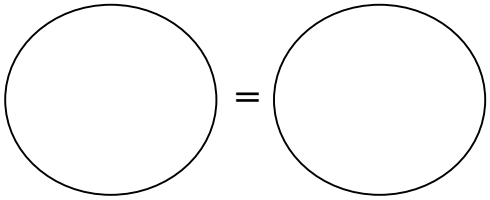
Finding Equivalent Fractions

Directions: Divide the circle into the appropriate amount of pieces given by the fraction given and shade the portion of the circle that corresponds to the given fraction. Then, using fraction circles, find a fraction that is equivalent to the given fraction. Divide the circle into the appropriate amount of pieces and shade the equivalent fractional amount of the circle.

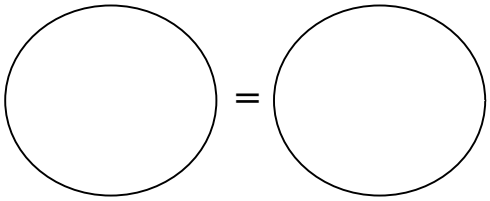
1. $\frac{5}{10} = \frac{\quad}{\quad}$



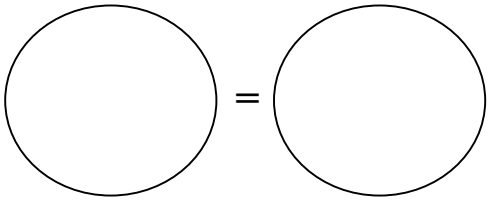
2. $\frac{\quad}{\quad} = \frac{2}{6}$



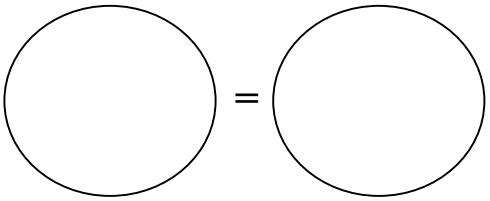
3. $\frac{1}{4} = \frac{\quad}{8}$



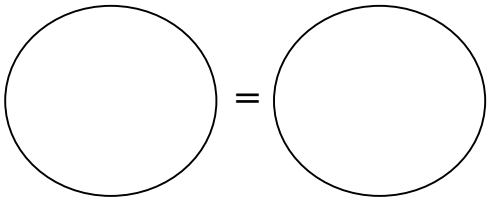
4. $\frac{1}{5} = \frac{\quad}{\quad}$



5. $\frac{\quad}{\quad} = \frac{3}{6}$



6. $\frac{2}{2} = \frac{\quad}{\quad}$



7. $\frac{1}{6} = \frac{2}{\quad}$

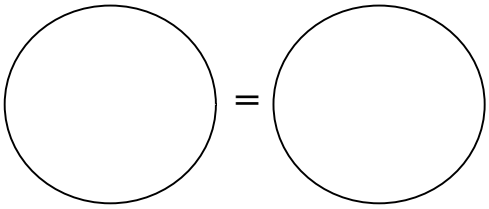
8. $\frac{3}{\quad} = \frac{6}{8}$

Answer Key ***Note: #1-6 have multiple answers (accept all that are correct)***

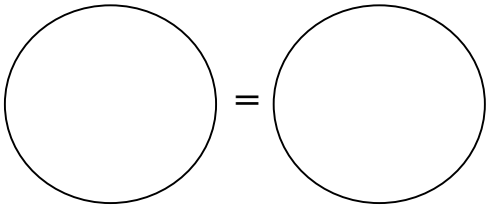
Finding Equivalent Fractions

Directions: Divide the circle into the appropriate amount of pieces given by the fraction given and shade the portion of the circle that corresponds to the given fraction. Then, using fraction circles, find a fraction that is equivalent to the given fraction. Divide the circle into the appropriate amount of pieces and shade the equivalent fractional amount of the circle.

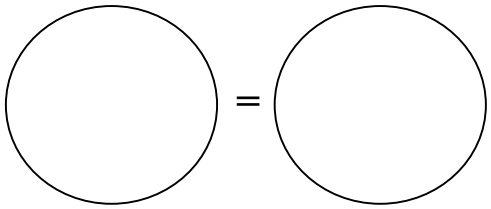
1. $\frac{5}{10} = \frac{1}{2}$



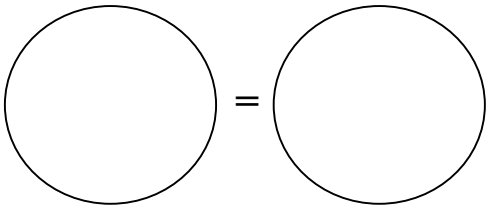
2. $\frac{1}{3} = \frac{2}{6}$



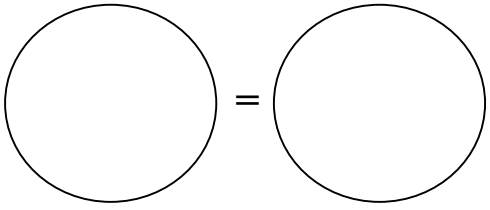
3. $\frac{1}{4} = \frac{2}{8}$



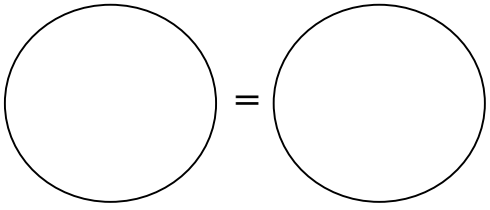
4. $\frac{1}{5} = \frac{2}{10}$



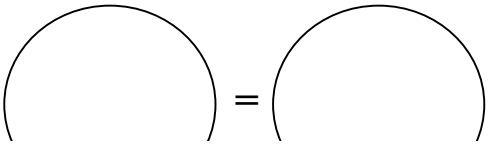
5. $\frac{1}{2} = \frac{3}{6}$



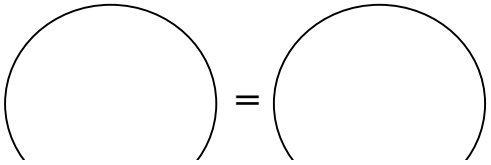
6. $\frac{2}{2} = \frac{4}{4}$



7. $\frac{1}{6} = \frac{2}{12}$



8. $\frac{3}{4} = \frac{6}{8}$



Equivalent Fractions

Directions: Find an equivalent fraction for each fraction given. Show your work.

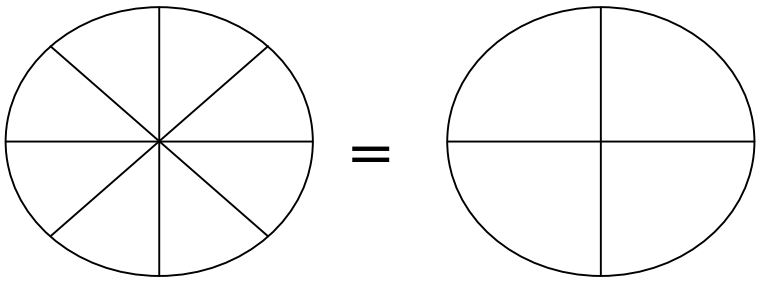
1. $\frac{2}{3} = \frac{\quad}{\quad}$

2. $\frac{5}{8} = \frac{\quad}{\quad}$

3. $\frac{2}{6} = \frac{\quad}{\quad}$

4. $\frac{\quad}{5} = \frac{3}{15}$

5. Shade in two fractions that are equivalent.



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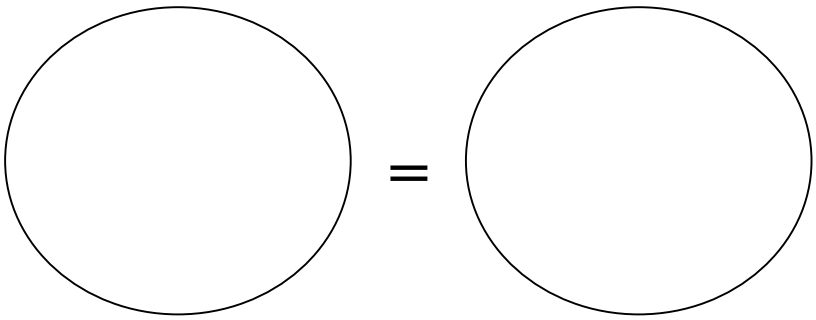


Answer Key
Note: #1-3 & # 5-6 have multiple answers. Accept all that are correct.

Equivalent Fractions

Directions: Find an equivalent fraction for each fraction given. Show your work.

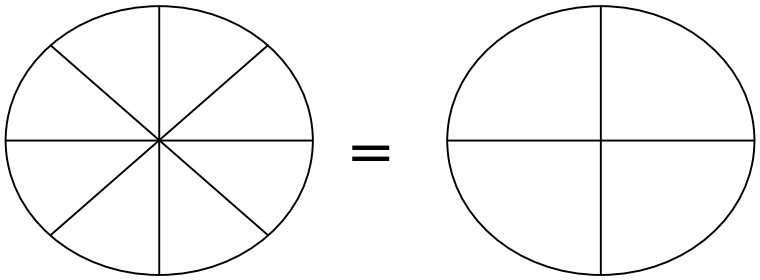
1. $\frac{2}{3} = \frac{4}{6}$

2. $\frac{5}{8} = \frac{15}{24}$

3. $\frac{2}{6} = \frac{1}{3}$

4. $\frac{1}{5} = \frac{3}{15}$

5. Shade in two fractions that are equivalent.



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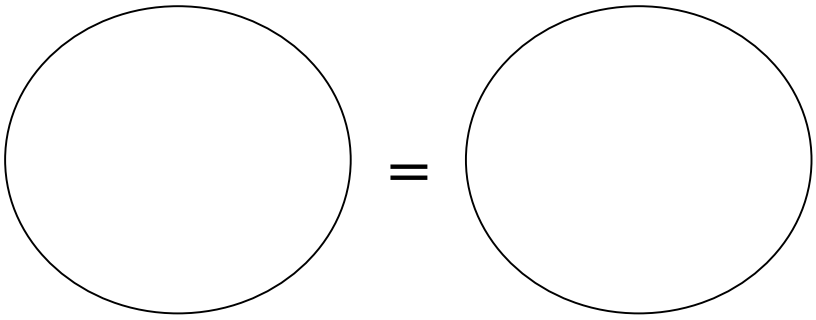


Adding & Subtracting Fractions
(with unlike denominators)

Objectives:

- Students will interact with computer technology to add fractions with unlike denominators.
- Students will manipulate fraction bars to subtract fractions with common (like) and unlike denominators.
- Students will observe that to add and subtract fractions with unlike denominators, there needs to be a common denominator between the fractions.
- Students will add and subtract fractions with unlike denominators with and without the aid of manipulatives.

Standards:

Strand: Number Sense and Operations Strand
Standard: Students will understand meanings of operations and procedures, and how they relate to one another.
Performance Indicator: 6.N.16 Add and subtract fractions with unlike denominators.

Materials:

- Transparent fraction bars
- Overhead projector
- Overhead markers?
- Fraction bars – one set for each pair of students)
- "Subtracting Fractions (with unlike denominators)" worksheet
- Writing utensils – pencils, pens, etc.
- Homework worksheet (on adding and subtracting fractions with unlike denominators)
- Computers (one for every two students)
- Computer access to National Library of Virtual Manipulatives (either through the internet or through the installation of the program on each computer)

Anticipatory Set:

To get the students interested in the lesson the teacher will tell the following story:
I want to make my Christmas treats this weekend. I have three different kinds of cookies to make: cut-outs cookies, butter cookies and mint brownies. The cut-out cookie recipe calls for 2 1/2 cups of sugar. The butter cookie recipe says I need 1 3/4 cups of sugar and the recipe for mint brownies says that I need 4 2/3 cups of sugar. If I have 9 cups of sugar, do I have enough or do I need to by more?
Have the students work with a partner to figure out if I have enough sugar. Ask the students to explain how they figured out if I will have enough. *(Yes, I have enough sugar.)*

Procedure:

(1) Using the computer demonstrate to the students how to get to the National Library of Virtual Manipulatives. Show the students how to find "Fractions – Adding" (which is found in Number Sense & Operations, Grades 6-8). Using the "Fractions – Adding" activity, demonstrate to the students how to add fractions with unlike denominators.

(2) Break the students into pairs.

(3) Give each pair a set of fraction bars. In pairs, have the students discover what fraction each colored bar represents. The students should share their findings with the class. As the class shares, the students should write their findings on the overhead, using the appropriate colored marker. The students should make the following observations:
- green bars – halves
- yellow bars – thirds
- blue bars - fourths
- purple bars – fifths
- red bars – sixths
- black bars – tenths
- orange bars – twelfths

(4) Using the fraction bars, review with the students how to subtract fractions with <u>like</u> denominators. Use the following problems to review:
- 3/4 – 1/4 = 2/4
- 5/5 – 1/5 = 4/5

(5) Using the fraction bars, demonstrate how to subtract fractions that have <u>unlike</u> denominators. Use the following problems to demonstrate:
- 4/5 – 1/2 = 3/10
- 5/6 – 1/3 = 3/6

(6) Break the pairs of students into two groups. The first group will use the computers to manipulate the "Fractions – Adding" activity in the National Library of Virtual Manipulatives. The second group of pairs of students should complete "Subtracting Fractions" worksheet with their partners, using the fraction bars.

(7) After about 10 minutes, the groups should switch activities.

As the students work the teacher should circulate around the classroom, providing assistance as needed.

(8) Collect the worksheets that the students completed to use for assessment.

Closure:

When the students have completed the worksheet, gather the students together and ask the following questions:

- Do you notice anything about the answer to each problem? If so, what? *(The students should notice that the number in the denominator is common to both fractions.)*
- Is there a way that I can figure out how to add and subtract fractions without using fraction bars? How could you do this? (*The students should realize that you need to find a common denominator between the two fractions and then create fractions that are equivalent to those that are given in the problem. Then you can add or subtract the two fractions.)*

In their math journals, have the students to summarize how to add and subtract fractions with unlike denominators and give and example of each. *Note: The teacher should collect these journals and use for assessment.*

Homework:

The students will complete a worksheet on adding and subtracting fractions with unlike denominators ("Adding & Subtracting Fractions with Unlike Denominators"), without the aid of fraction bars. *Note: If there are students in the class that have special learning needs, consider allowing these students to complete the homework with the aid of the fraction bars and/or computer.*

Name _____

Subtracting Fractions
(using fraction bars)

Directions: Using fraction bars, find the difference of the two fractions.

1. $5/6 - 2/3 =$

2. $10/12 - 3/4 = 11/12$

3. $7/8 - 1/2 =$

4. $2/10 - 1/5 =$

5. $\begin{array}{r} \frac{6}{8} \\ - \frac{1}{4} \\ \hline \end{array}$

6. $\begin{array}{r} \frac{10}{12} \\ - \frac{2}{3} \\ \hline \end{array}$

7. $\begin{array}{r} \frac{4}{6} \\ - \frac{1}{3} \\ \hline \end{array}$

8. $\begin{array}{r} \frac{2}{3} \\ - \frac{2}{4} \\ \hline \end{array}$

Answer Key

Subtracting Fractions
(using fraction bars)

Directions: Using fraction bars, find the difference of the two fractions.

1. $5/6 - 2/3 = 1/6$

2. $10/12 - 3/4 = 11/12 \quad 1/12$

3. $7/8 - 1/2 = 3/8$

4. $2/10 - 1/5 = 0$

5. $\frac{6}{8} - \frac{1}{4} = \frac{6}{8} - \frac{2}{8} = \frac{4}{8} = \frac{1}{2}$

6. $\frac{10}{12} - \frac{2}{3} = \frac{10}{12} - \frac{8}{12} = \frac{2}{8} = \frac{1}{2}$

7. $\frac{4}{6} - \frac{1}{3} = \frac{4}{6} - \frac{2}{6} = \frac{2}{6} = \frac{1}{3}$

8. $\frac{2}{3} - \frac{2}{4} = \frac{8}{12} - \frac{6}{12} = \frac{2}{12} = \frac{1}{6}$

Name _____

Adding & Subtracting Fractions
(with unlike denominators)

Directions: Add or subtract the fractions given. Show your work.

1. $7/12 + 1/6 =$

2. $2/4 + 3/16 =$

3. $5/6 - 1/3 =$

4. $2/3 - 1/8 =$

5.
$$\begin{array}{r} 6 \\ 24 \\ +\ 8 \\ \hline 3 \\ \hline \end{array}$$

6.
$$\begin{array}{r} 5 \\ 10 \\ -\ 6 \\ \hline 20 \\ \hline \end{array}$$

7. Look at the following number sentence. Tell whether it is true or false and why.

$$7/9 + 3/9 = 10/18$$

Answer Key

Adding & Subtracting Fractions
(with unlike denominators)

Directions: Add or subtract the fractions given. Show your work.

1. $7/12 + 1/6 = 9/12 = 3/4$

2. $2/4 + 3/16 = 11/16$

3. $5/6 - 1/3 = 3/6 = 1/2$

4. $2/3 - 1/8 = 13/24$

5.
$$\begin{array}{r} \frac{6}{24} = \frac{6}{24} \\ +\ \frac{8}{3} = \frac{64}{24} \\ \hline \frac{70}{24} \end{array}$$

6.
$$\begin{array}{r} \frac{5}{10} = \frac{10}{20} \\ -\ \frac{6}{20} = \frac{4}{20} \\ \hline \frac{6}{10} \end{array}$$

8. Look at the following number sentence. Tell whether it is true or false and why.

$$7/9 + 3/9 = 10/18$$

This number sentence is false because the denominators have been added together, which is not supposed to be done.

Multiplying & Dividing Fractions
(with unlike denominators)

Objectives:

- Students will manipulate a computer activity to observe what happens when fractions with unlike denominators are multiplied together.
- Students will manipulate pattern blocks to divide fractions with unlike denominators.
- Students will perform multiplication and division operations using fractions with unlike denominators.

Materials:

- Computers – enough for half the class to work on at the same time
- Computer access to National Library of Virtual Manipulatives (either through the internet or through the installation of the program on each computer)
- Sets of pattern blocks (including at least 4 yellow hexagons blocks, 6 red trapezoid blocks, 9 blue rhombus blocks, and 12 green triangle blocks) – enough for half of the class to use at the same time
- One set of overhead pattern blocks
- Overhead projector
- Overhead markers
- Writing utensils – pencils, pens, etc.

Standards:

Strand: Number Sense and Operations Strand
Standard: Students will understand meanings of operations and procedures, and how they relate to one another.
Performance Indicator: 6.N.17 Multiply and divide fractions with unlike denominators.
Performance Indicator: 6.N.18 Multiply and divide mixed numbers with unlike denominators.

Anticipatory Set:

To get the students motivated to learn, the teacher will share the following scenario with the students:

I want to make soup for dinner tonight. The recipe I have makes enough to feed 20 people. However, I only need to feed 5 people and I don't want to have leftovers. Can I use this recipe? If so, what do I need to do to it so I can make dinner for 5 people instead of 20?

Allow the students to share their ideas. If the students do not come to the idea on their own that you can all the ingredients in the recipe by 1/4, then share the idea with them at this time. Ask the students, "If the original recipe calls for 12 2/3 cups of water. How many cups will I need now?" Allow them to share their ideas and how they solved this problem. (12 2/3 * ¼ = 3 1/6)

Procedure:

(1) Show the students how to multiply using the National Library of Virtual Manipulatives "Multiplication of Fractions" activity" (which is found in Number Sense & Operations, Grades 6-8). Make sure to show a few problems so that the students understand how the activity works. (If necessary, review with the students how to access the National Library of Virtual Manipulatives on the computer.)

(2) Send half of the students to work on the "Multiplying Fractions" activity on the computer.

(3) With the other half of the students, demonstrate how to multiply fractions using pattern blocks. Use the following examples to demonstrate this:
- 2 1/3 * 1/2 = 7/6 = 1 1/6
- 4/2 * 1/3 = 4/6 = 2/3

(4) Explain to the students that to divide by a fraction, you multiply by the reciprocal fraction. Show the students how to find the reciprocal. Have the students find the reciprocal of the following fractions:
- 2/3 goes to 3/2
- 4/2 goes to 2/3
- 5/6 goes to 6/5

(5) Have the students practice dividing fractions using the following problems.
- 1 1/3 divided by 1/5 equals 20/3 or 6 2/3
- 1/7 divided by 2/8 equals 8/14 or 4/7
- 2 6/9 divided by 2/3 equals 24/6 or 4
- use more examples if necessary

(6) Have the group of students at the computer switch with the students that were working with the teacher. The teacher should then repeat steps 3, 4, & 5 with the second group of students.

Closure:

In their math journals, have the students to summarize how to multiply and divide fractions and give and example of each. *Note: The teacher should collect these journals and use for assessment.*

Homework:

Students will find a recipe at home. The students will multiply the recipe by 2/3 and rewrite the recipe. The students will then divide the original recipe by 3/4 and rewrite the recipe. The students need to bring a copy of the original recipe to school the following day, along with the rewritten recipes.

From Fractions to Decimals

Objectives:

- Students will observe that fractions can also be written as decimals.

Materials:

- Transparent decimal squares – 10ths & 100ths
- Overhead projector
- Small whiteboards – one per student
- Dry erase markers (one per student) & erasers
- "Expressing Fractions in Different Ways" worksheet – one per student
- "I Have, Who Has" fraction cards

Standards:

Area: Content Strands
Strand: Number Sense and Operations Strand
Standard: Students will understand meanings of operations and procedures, and how they relate to one another.
Performance Indicator: 6.N.21 Find multiple representations of rational numbers (fractions, decimals, and percents 0 to 100).

Anticipatory Set:

Tell each student to write look around the room and find either a fraction or a decimal.

Procedure:

(1) Place a transparent decimal square with no bars shaded in on the overhead. Ask the students to give the name of each of the bars in the square (10ths).

(2) Give each student a small whiteboard and a marker. Place a transparent decimal square on the overhead projector and ask the students to write the name of the shaded region, in terms of a fraction, on their small whiteboard. *Note: The students should hold up their whiteboards when they are completed so that the teacher can make a quick assessment about the class.*

(7) Repeat step 2 for each of the 10 decimal squares (that are 10ths) with a shaded region.

(8) Repeat step 1 & 2 for each of the 10 decimal squares (that are 100ths) with a shaded region equal to that of the 10ths. For example, the 20/100 and 50/100 decimal squares should be used, but the 25/100 and 55/100 should not be used at this time.

(9) Ask the students to think about place value. With a partner the students should attempt to recall the order of place value for decimal places. The students should write down the order (from closest to the decimal point to farthest away) on their whiteboards.

(10) Ask the students to share what they recall with their classmates.

(11) Lead the students into a discussion about how the name of the place value, is actually telling us what fractional part is being represented. Share the following example with the students:
- Write the number 325.4 on the overhead and ask a student to read the number to you. (Many will say three hundred twenty-five point four. Instead, encourage the students to read the number as three hundred twenty-five and four tenths.) Use a few more numbers until the students have the idea.

(12) When the students seem to understand that numbers with decimals can be said to have tenths, place one of the (10ths) decimal squares on the overhead. Ask the students to name the shaded bar(s) in terms of a fraction and then in terms of a decimal. The students should write their responses on their whiteboards.

(13) Continue using each of the 10ths decimal squares with shaded bars. As the students work, tell the students that these two numbers (the fractional representation and the decimal representation are equivalent).

(14) Repeat steps 7, 8, & 9 using the 100ths decimal squares in the same way (as the 10ths decimal squares were used). If the students seem to understand this idea, feel free to include decimal squares that represent shaded regions of 25/100, 45/100, or even 350/1000, etc.

Closure:

Play "I Have, Who Has" with the students. This game will help to connect each of the fraction lessons in this unit.

Homework:

Students will complete the "Expressing Fractions in Different Ways" worksheet.

Name _____

Expressing Fractions in Different Ways

Directions: Express each fraction in the ways requested.

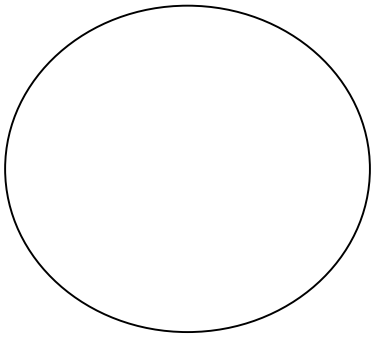
1. Using the fraction **8/10**

f. _____ out of _____

g. Write as a decimal: _____

h. Write an equivalent fraction: _____

i. Divide the circle into the appropriate number of pieces and shade in the appropriate amount on the circle.



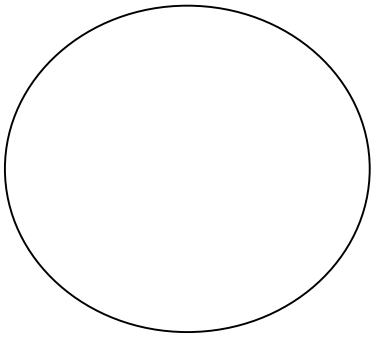
2. Using the fraction **3/5**

f. _____ out of _____

g. Write an equivalent fraction: _____

h. Write as a decimal: _____

i. Divide the circle into the appropriate number of pieces and shade in the appropriate amount on the circle.



3. Using the fraction **25/100**

d. _____ out of _____

e. Write as a decimal: _____

f. Write an equivalent fraction: _____

4. Explain how to multiply two fractions together.

_____

_____

_____

_____

5. What does a fraction represent?

_____

_____

_____

Answer Key

Note: Many of the problems have numerous correct answers. Accept all that are correct.

Expressing Fractions in Different Ways

Directions: Express each fraction in the ways requested.

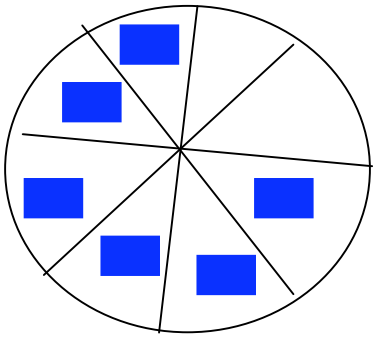
1. Using the fraction **8/10**

a. 8 out of 10

b. Write as a decimal: .8

c. Write an equivalent fraction: 4/5

d. Divide the circle into the appropriate number of pieces and shade in the appropriate amount on the circle.



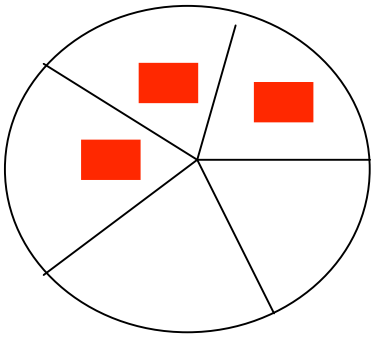
2. Using the fraction **3/5**

a. 3 out of 5

b. Write an equivalent fraction: 6/10

c. Write as a decimal: .6

d. Divide the circle into the appropriate number of pieces and shade in the appropriate amount on the circle.



3. Using the fraction **25/100**

a. 25 out of 100

b. Write as a decimal: .25

c. Write an equivalent fraction: 1/4

4. Explain how to multiply two fractions together.

To multiply two fractions first, multiply the numerators together to get the new numerator. Then multiply the denominators together to get the new denominator.

5. What does a fraction represent?

A fraction represents a part of a whole.

I Have, Who Has

playing cards

½ .6	6/10 7/3	2 1/3 .65	65/100 3 out of 5	3/5 ½ + 2/3
7/6 2/2	*1* 1/3 * 3/4	¼ 25/100	.25 1/16 + 1/16	1 out of 8 2/5
4/10 .3	3/10 3/7 – 1/7	2 out of 7 6/15	2/5 The sum of 6/3 and 5/2	27/6 2 3/11
25/11 The product of ¼ and 1/5	1/20 30 out of 40	¾ The quotient of 2/3 and 5/10	20/15 Two times 6/2	12 .4
4/10 18 out of 20	.9 98/100	.98 1/3 of 4/3	4/9 24/25 – 1/5	19/25 1 – ½