

Title: The Fraction Food Fantasy

Brief Overview:

The students will plan a luncheon for the teachers in honor of Teacher Appreciation Week. Different groups of students will be given a recipe, and they will be responsible for increasing the recipe for the luncheon.

Links to NCTM Standards:

- **Mathematics as Problem Solving**
Students will demonstrate their ability to solve problems in mathematics including problems with open-ended answers and problems which are solved in a cooperative atmosphere.

- □ **Mathematics as Communication**
Students will demonstrate their ability to communicate mathematically. They will read, write, and discuss mathematics with language and the signs, symbols, and terms of the discipline.

- □ **Mathematics as Reasoning**
Students will demonstrate their ability to reason mathematically. They will make conjectures, gather evidence, and build arguments.

- □ **Mathematical Connections**
Students will demonstrate their ability to connect mathematics topics within the discipline and with other disciplines.

- **Estimation**
Students will demonstrate their ability to apply estimation strategies in computation, measurement, and problem solving.

- **Number Sense and Numeration**
Students will demonstrate their ability to describe and apply number relationships using concrete and abstract materials. They will choose appropriate operations and describe effects of operations on numbers.

- **Measurement**
Students will demonstrate and apply concepts of measurement using non-standard and standard units and customary units. They will estimate and verify measurements.

- **Fractions and Decimals**

Students will demonstrate and apply concepts of fractions, mixed numbers, and improper fractions; use models to relate fractions to whole numbers and mixed numbers; and find equivalent fractions and compute with fractions.

Grade/Level:

Grades 3-4

Duration/Length:

4 class sessions

Prerequisite Knowledge:

Students should have working knowledge of the following skills:

- Recognize fractions as parts of a whole
- Equivalent fractions
- Adding fractions with like denominators
- Improper fractions and mixed numbers
- Estimation
- Measurement using cups, tablespoons, and teaspoons
- Proper format of a friendly letter

Objectives:

Students will:

- work cooperatively in groups.
- demonstrate an understanding of equivalent fractions.
- add fractions with like denominators.
- rename improper fractions as mixed numbers
- evaluate daily activities through journal writing.
- create an invitation using the correct form of a friendly letter.
- develop a class recipe book for a luncheon.

Materials/Resources:

- □ The Teacher from the Black Lagoon by Mike Thaler
- ½ sheet (9x12) of purple, white, green, and yellow construction paper for each student
- Scissors, ruler, and black crayon
- Overhead fraction circles and overhead pattern blocks
- 1 set of fraction circles and pattern blocks for each group

- Student Resource Sheets 1 - 11
- Teacher Resource Sheets 1 - 8

Development/Procedures:

Activity One : “Let’s Book It”

- The teacher will read the book The Teacher From the Black Lagoon by Mike Thaler. Discuss the element of fractions in the book.
- After reading the book, each child will need 1/2 sheet of construction paper for the following colors: purple, white, green, and yellow. They will also need scissors, ruler, and a black crayon.
- Have students take the purple sheet and write a large 1 in the middle.
- Next have them draw a 12 inch line the width of the ruler at the top of the remaining sheets of paper.
- Take the white sheet of paper and fold it into two equal parts. Using the scissors, have the students cut on the fold up to the line. (Be careful not to cut the paper all the way in half.) Next have them label each half with the fractional value (1/2).
- Take the green sheet of paper and fold it into four equal parts.. Using the scissors, have the students cut on each fold up to the line at the top. Label each section with the fractional value (1/4).
- Take the yellow sheet of paper and fold it into eight equal parts. Using the scissors, the students cut on each fold up to the line at the top. Label each section with the fractional value (1/8).
- Assembling the fraction book as follows:
 1. Lay the yellow sheet representing 1/8 down on the desk.
 2. Lay the green sheet representing 1/4 on top of the yellow.
 3. Lay the white sheet representing 1/2 on top of the green.
 4. Lay the purple sheet representing 1 on top of the white.
 5. Staple all the sheets together at the top margin.
- Using the fraction booklet, review equivalent fractions with the class.
- Provide each student with one copy of Student Resource 1 and four copies of Student Resource 2. Once the journal is assembled, have the student use the first page to reflect on today’s activity.

Activity Two: “Halves and Halve-Notes”

- Using the overhead fraction circles, demonstrate how to make 1 whole circle using the same color fractions pieces.
Place the three green circles on the projector and ask the students how many green pieces there are ? (3) What is the fractional value of each green piece? ($1/3$)
- Ask the students to set up an addition equation using the color names.
- □ Write an addition equation on the projector for the example.
(green + green + green = 1 whole circle or 1 whole cup)
- □ Ask a student how they would write the mathematical equation.
($1/3 + 1/3 + 1/3 = 1$ whole cup)
- Continue with other examples if needed.
- Provide each group with a set of fraction circles and a copy of Student Resource 3.
- Do an example with the class on the overhead projector using one orange, one red, and one green fraction piece. Ask what the equation would be using the names of each color..
(orange + red + green = 1 whole cup)
- Next have a student tell what the mathematical equation would be for the fraction pieces.
($1/2 + 1/6 + 1/3 = 1$ whole cup)
- Have the students complete the Student Resource sheet together in their groups. When everyone has finished, go over the sheet with the class.
- In their Math journals, have the students reflect on today’s activity.

Activity Three: “Don’t be a Blockhead!”

- Using overhead pattern blocks, display the following pattern blocks: 1 yellow hexagon, 1 red trapezoid, 1 blue parallelogram, and 1 green triangle.
- Assign the following fractional value to each: hexagon = $1/2$ trapezoid = $1/4$
parallelogram = $1/6$ triangle = $1/12$
- On the overhead projector, display three yellow hexagons. Ask the students to set up and solve the mathematical equation for the model. ($1/2 + 1/2 + 1/2 = 3/2$)
- Lead a discussion about $3/2$ being an improper fraction. Ask the students if they know another way to write $3/2$. ($1 \frac{1}{2}$) Review mixed numbers with them.

- □ Do more examples with the other pattern blocks if needed.
- □ Distribute pattern blocks to each group and a copy of Student Resource 4. Go over the directions with the whole class and do one example together.
- □ When the students are finished, go over the Student Resource sheet with them.
- □ In their Math journal, have the students reflect on today's activities.

Activity Four: "Interesting Invitations"

- Review the five main parts of a friendly letter (heading, greeting, body, closing, and signature).
- Provide each student with a copy of Student Resource 5. Explain that their job will be to write an invitation to a teacher inviting them to the luncheon.
- The students must include an explanation about how they used math to prepare the recipe for the luncheon.
- The students should complete a rough draft and have another student edit it before using the student resource sheet.
- Once the invitation is completed, have the students decorate their invitations using patterns with fractions.
- The teacher will use the rubric (Teacher Resource 3) to score the invitation.

Performance Assessment:

There will be continuous assessment throughout all activities, using teacher observation, journal writing, student resource sheets, and rubrics. The final assessment activity below will be scored using a rubric (Teacher Resource 6):

- Divide the class into six groups. Using one copy of Student Resource Sheets 6 - 11, distribute one to each group. Each group will have a different menu item to work on.
- Read the following scenario to the class:
Your class has decided to prepare a luncheon for the teachers and staff at your school in honor of Teacher Appreciation Week. Your menu has already been decided. Each group will be responsible for preparing one item on the menu . Your task will be to increase the recipe in order to feed 20 teachers.

- Provide time for the groups to read their recipe. Using the box at the bottom of their Student Resource sheet, have the students record an estimation of the amount needed to feed 20 people.
- Put the following example on the overhead projector:
1/4c. orange juice serves 1 person

Ask the students how they would figure out the amount of orange juice needed to serve 4 people. ($1/4+1/4 +1/4+1/4= 1$ whole cup)

Ask how much would be needed to serve 5 people.

($1/4 +1/4+1/4+1/4+1/4=5/4$ or $1 \frac{1}{4}$ cups)

- The students will need to find the actual amount needed for their recipe. (Note: Students will use addition of fractions to find the actual amount.) Manipulatives may be used if needed.

Extension/Follow Up:

- Add a decimal connection by having the students find the cost of each recipe for the number of servings given and for the increased number.
- Convert the fractions to decimals and percents.
- Investigate the food pyramid and create a circle graph to show the nutritional value of your recipe.
- Design and grow a vegetable garden or an herb garden. Show which fractional part of your garden each vegetable will be. Ex. $1/3$ beans, $1/4$ lettuce, $1/6$ carrots, etc.

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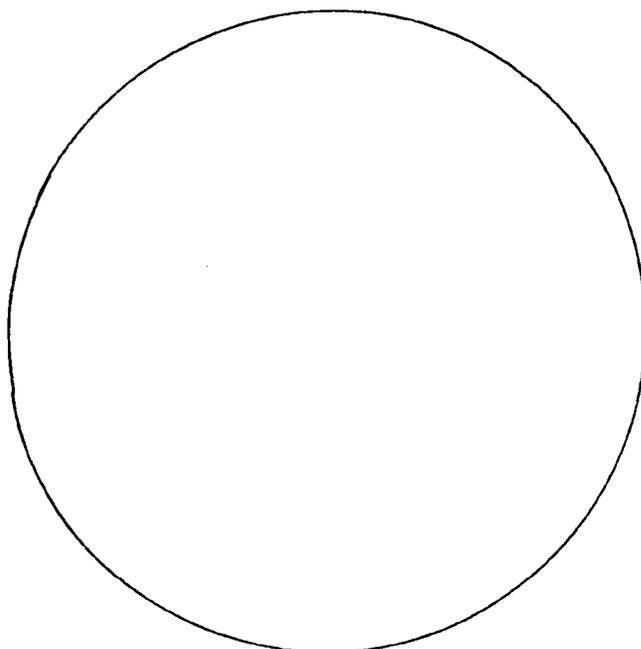
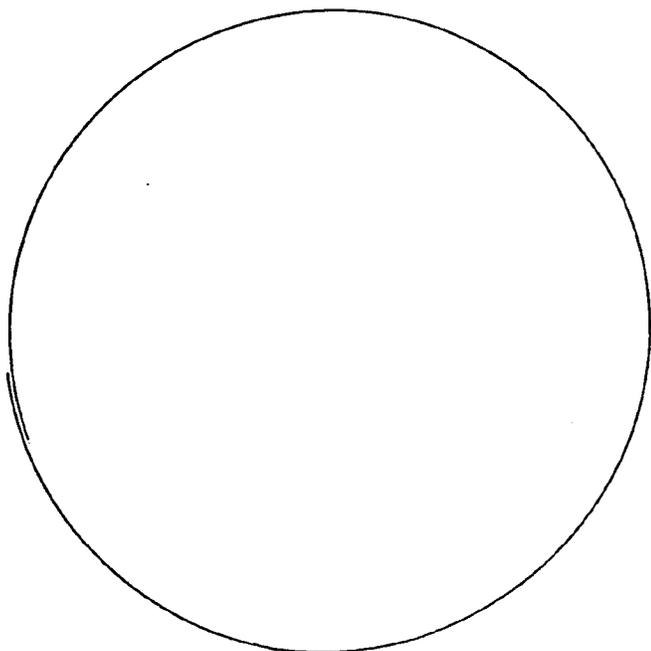
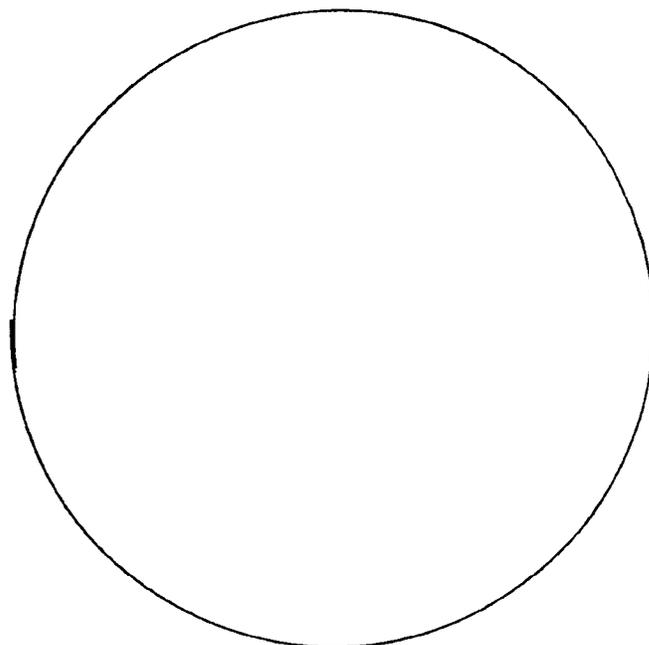
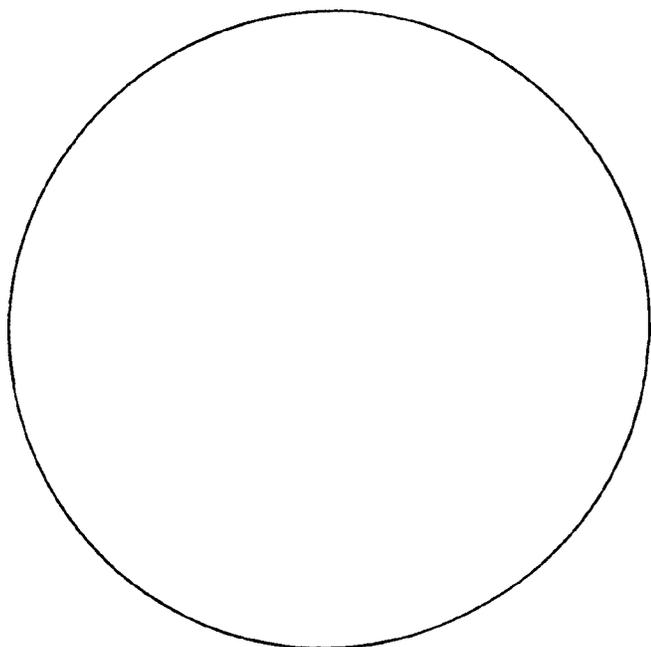
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Name _____ Date _____

"HALVES AND HALVE-NOTS"

Directions: Using your fraction circles, find four different ways to make a whole cup. Do not remove any pieces until all four circles are complete. Each circle should use at least 3 different colors. On line #1, write the equation that uses the names of each color. On line #2, write the mathematical equation for each circle.

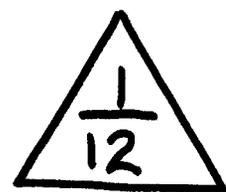
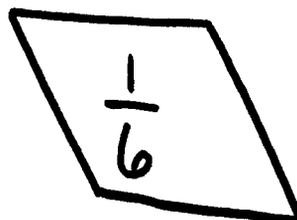
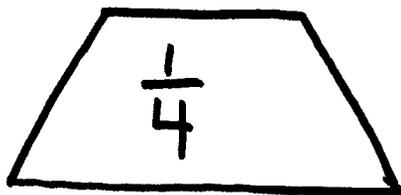
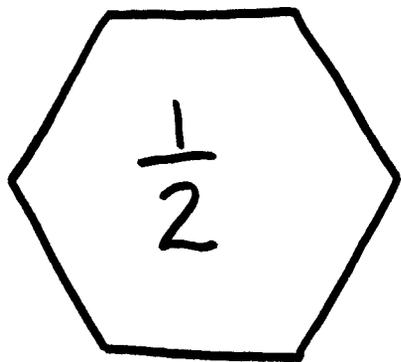


Name _____ Date _____

"Don't Be a Blockhead"

Directions: Using the pattern blocks below, add the fractions and write the answer as an improper fraction.

(Hint: An improper fraction is when the numerator is larger than the denominator. It can also be written as a mixed number.)



$$1. \frac{1}{2} + \frac{1}{2} + \frac{1}{2} = \square$$

$$6. \frac{11}{12} + \frac{15}{12} = \square$$

$$2. \frac{5}{6} + \frac{10}{6} = \square$$

$$7. \frac{8}{2} + \frac{9}{2} = \square$$

$$3. \frac{3}{4} + \frac{8}{4} = \square$$

$$8. \frac{18}{12} + \frac{5}{12} = \square$$

$$4. \frac{4}{6} + \frac{9}{6} = \square$$

Now write as a mixed number.

$$1) \square$$

$$5) \square$$

$$2) \square$$

$$6) \square$$

$$3) \square$$

$$7) \square$$

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

$$4) \square$$

$$8) \square$$

Group # _____

CHUNKY CHICKEN SALAD

- 6c. Cooked chicken breasts
- 3/4c. Mayonnaise
- 1/2c. Celery
- 1/2tsp. Salt
- 1/4tsp. Pepper

Mix all ingredients in a bowl. Chill.
Serves 5

Ingredients	Estimation	Actual	Difference

Group # _____

FRUITY FRUIT SALAD

- 1/2 Apple
- 1/2 Banana
- 4 Strawberries
- 3 Grapes
- 1TBS. Coconut

Mix all ingredients in a bowl. Chill.
Serves 1

Ingredients	Estimation	Actual	Difference

Group# _____

TERRIFIC TOSS SALAD

- 5c. Lettuce
- 3/4c. Cucumber
- 1/2c. Grated carrots
- 1/4c. Chopped green onions
- 1/2c. Tomatoes

Mix all ingredients in a large bowl. Chill.
Serves 5

Ingredients	Estimation	Actual	Difference

Group# _____

Party Punch

- ½ gal. Orange Sherbet
- 4 liters Ginger Ale
- ½ Orange, sliced

Mix all ingredients in a large punch bowl. Chill.
Serves 10

Ingredients	Estimation	Actual	Difference

Group # _____

Per ky Pasta Sal ad

- 3 1/2c. Cooked pasta
- 1 1/2c. Cubed cheese
- 1c. Carrots, sliced
- 1c. Broccoli florets
- 1/2c. Black olives, sliced
- 1 8oz. bottle of Italian dressing

Mix all ingredients in a large bowl. Chill.
Serves 4

Ingredients	Estimation	Actual	Difference

Group # ____

CREATIVE CAKE

Your group has been given the job of decorating a sheet cake. Your cake is must be divided into the following fractional parts:

$\frac{1}{8}$ Yellow

$\frac{2}{6}$ Green

$\frac{1}{5}$ Pink

$\frac{3}{12}$ Orange

____ Purple

Using the Geoboard, find what fractional part of your cake is missing. Be sure to check your work using the Explorer calculator.

Answer Key for "Halves and Halve-Notes"

1. blue+red+red+brown+yellow+yellow= 1 cup
 $1/5+1/6+1/6+1/8+1/10+1/10= 1$ cup

2. orange+purple+red+white= 1 cup
 $1/2+1/4+1/6+1/12= 1$ cup

3. green+yellow+yellow+purple+blue= 1 cup
 $1/3+1/10+1/10+1/4+1/5= 1$ cup

4. blue+blue+red+purple+yellow+white = 1 cup
 $1/5+1/5+1/6+1/4+1/10+1/12 = 1$ cup

Answer Key for "Don't Be a Blockhead!"

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

2. $\frac{15}{6}$

3. $1\frac{1}{4}$

4. $\frac{13}{6}$

5. $\frac{7}{4}$

6. $\frac{26}{12}$

7. $\frac{17}{2}$

8. $\frac{23}{12}$

Mixed Numbers

1. $1\frac{1}{2}$

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

3. $2\frac{3}{4}$

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

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

6. $2\frac{2}{12}$ or $2\frac{1}{6}$

7. $8\frac{1}{2}$

8. $1\frac{11}{12}$

Teacher Resource 3

SCORING RUBRIC FOR INVITATION

Description	Very Good			Satisfactory	Unsatisfactory
	5	4	3	2	1
I followed the form for writing a friendly letter.					
I used correct spelling, capitalization, and punctuation.					
My invitation contains all important information.					
My sentences are clear and easy to understand.					
I used mathematical language to explain the fraction activities.					
My work is neat.					

Answer keys for the final project

CHUNKY CHICKEN SALAD

Ingredients	Actual
chicken	24c.
mayonnaise	3c.
celery	2c.
salt	2tsp.
pepper	1tsp.

FRUITY FRUIT SALAD

Ingredients	Actual
apple	10
banana	10
strawberries	80
grapes	60
coconut	2TBS.

TERRIFIC TOSS SALAD

Ingredients	Actual
lettuce	20c.
cucumber	3c.
carrots	2c.
onions	1c.
tomatoes	4c.

Answer keys for final project (con't.)

PARTY PUNCH

Ingredients	Actual
sherbet	1gal.
ginger ale	8 liters
orange	1

PERKY PASTA SALAD

Ingredients	Actual
pasta	17 ½ c.
cheese	7 ½ c.
carrots	5 c.
broccoli	5 c.
olives	2 ½ c.
dressing	5 bottles

SCORING RUBRIC FOR ASSESSMENT

POINTS	DESCRIPTION
4	<p><u>OUTSTANDING:</u> I demonstrated full understanding of addition and subtraction of fractions and mixed numbers and can convert fractions to mixed numbers. My answers are accurate.</p>
3	<p><u>ACCEPTABLE:</u> I demonstrated understanding of addition and subtraction of mixed numbers, improper fractions and mixed numbers. Some of my answers are not accurate.</p>
2	<p><u>MORE PRACTICE NEEDED:</u> I have some idea of how to find the solutions to the problems but most answers are not accurate. I need more practice.</p>
1	<p><u>NO PROGRESS ACCOMPLISHING TASK:</u> I did not understand the activity. My ideas about adding and subtracting mixed numbers and converting improper fractions to mixed numbers do not relate to the activity.</p>

TEACHER JOURNAL PAGE

DATE: _____

ACTIVITY: _____

TYPE OF ACTIVITY: Group _____ Individual _____
Centers _____ Assessment _____

SUCCESSSES/WHAT WENT WELL:

IMPROVEMENTS/TIPS FOR NEXT YEAR: