Fractions in the Kitchen

Subject Area: Math

Grade Level(s): 7

Duration of Activity: 2 Days

Description of Activity:

Following the study of the addition, subtraction, multiplication, and division of fractions, the students will use the World Wide Web to locate recipes that contain fractions. This hands-on learning experience will help students recognize that fractions are used in everyday life. Students will apply the rules for multiplication of fractions and for finding the least common denominator for a group of fractions.

Objectives: The student will be able to

- use the World Wide Web for research.
- identify fractions found in everyday life.
- compare and order all real numbers and perform operations with rational numbers.

Materials/Equipment:

- Computers with Internet access
- Scratch paper for mathematical calculations
- Handout 1: Sample Recipe [Teachers should print out a recipe found online at Cooking.com / http://www.cooking.com. Select a recipe containing ingredients expressed in fractions. Print out a sample recipe as Handout 1.]
- Handout 2: Recipe Chart Practice Exercise
- Handout 3: Recipe Chart Assessment

Prerequisites (skills or background needed):

- Students should know number theory and fraction concepts.
- Students should have knowledge of operations with fractions.
- Students should know how to research information on the World Wide Web.

Procedure

Teacher Component: The teacher will

1. bookmark Web sites on the World Wide Web before beginning activity.
2. review basic mathematical operations using fractions.
3. give students Handout 1: Sample Recipe downloaded from Cooking.com / http://www.cooking.com and discuss the way in which the ingredients are listed, with some as whole numbers and some as fractions.

4. provide students with Handout 2: Recipe Chart Practice Exercise and point out the three columns of information: Ingredients, Double Ingredients, and Least Common Denominator.
5. instruct students how to double their recipes' ingredients using the examples shown on the first two lines of the handout
6. provide one or two additional examples that review doubling fractions and reducing them (¾ + ¾ = 6/4 which reduces to 1 ½) or multiplying fractions (¾ x 2 = 6/4, which again reduces to 1 ½).
7. show students that the least common denominator in column C must be determined from the doubled ingredients in column B. All ingredients in column C must be written using the least common denominator.
8. walk the students through the first two lines on the chart.
9. ask students to complete the remaining parts of Handout 2: Recipe Chart Practice Exercise.
10. instruct students to double the recorded values and record the amount in column B.
11. remind students of the care they must take in recording the exact ingredients and provide examples of using incorrect amounts of specific ingredients, allowing students to respond by saying what might happen to the finished product if incorrect calculations are made. Care must be taken in doubling the amounts in the recipes.
12. instruct students that the final step will be to determine the least common denominator and record amounts using this number in column C.
13. review the answers to Handout 2: Recipe Chart Practice Exercise as a class.
14. instruct students to go to the Web site http://www.cooking.com and search for and select a recipe with 7-10 fractional ingredients with varying fractional measurements. They will use Handout 3: Recipe Chart Assessment to list the recipe ingredients, double the ingredients, and find the least common denominator for the doubled ingredients.

Student Activities: The student will

1. review basic mathematical operations using fractions.
2. review and discuss Handout 1: Sample Recipe downloaded from Cooking.com / http://www.cooking.com.
3. use Handout 2: Recipe Chart Practice Exercise to understand how recipe ingredients expressed as fractions can be doubled. Work through the first two items on the chart as a class. Complete the chart on an individual basis using the ingredients recorded on the handout.
4. review the answers to Handout 2: Recipe Chart Practice Exercise and discuss problems that might occur should incorrect quantities of ingredients be used when increasing or decreasing the amounts of ingredients in recipes.
5. go to the Web site http://www.cooking.com and select a recipe with 7-10 fractional ingredients.
6. record the exact ingredients from the recipe of choice into the Ingredients column of Handout 3: Recipe Chart Assessment.
7. double each ingredient in the *Ingredients* column doubling each numerator and placing the new numerator over the same denominator. Record this fraction in its new form in the Doubled Ingredients column.
8. find the least common denominator of the doubled ingredients and write each new amount in its new form in the Least Common Denominator column.
9. submit Handout 3: Recipe Chart Assessment for a grade to demonstrate mastery of working with fractions and finding the least common denominator.
10.

Accommodations:

- Students will be given needed technology assistance from peer tutors when the students with more computer experience complete their work.
- Students will work on the assignment with partners if there is limited time or computers.

Extension Activities:

- Students may print a copy of their selected recipe from the Web site to take home in order to prepare the dish and bring it to school to share with the class.
- Students can convert the measurements for the ingredients to metric measures.

Integration:

- Mathematics
- Technology
- Language Arts

Assessments:

1. Handout 3: Recipe Chart Assessment

Seventh Grade

1. Apply concepts and perform the basic operations with decimals, fractions, and mixed numbers. (P, M, N)

    f. Add, subtract, multiply, and divide fractions and mixed numbers.

National Educational Technology Standards (NETS):

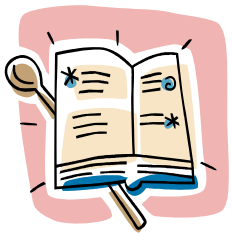
8. Select and use appropriate tools and technology resources to accomplish a variety of tasks and solve problems. (5, 6)

TerraNova:

12 Operation Concepts 11-21/22
Demonstrate an understanding of the properties and relationships of operations, relate mathematical representations to problem situations, and apply operational processes to solve problems.

1) Download a recipe from cooking .com

2)



Recipe Chart Practice Exercise

Student _____ **Date** _____

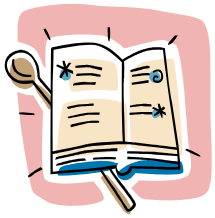
1. **The ingredients for Chocolate Chip Brownies are listed in the first column of the charts below.**

2. **Part 1: In the *Doubled Ingredients* column of the chart, double the amounts of each item in the *Ingredients* column.**

3. **Part 2: In the *Least Common Denominator* column, find the least common denominator for all <u>fractional</u> ingredients found in the *Ingredients* column. Write "Disregard" for any ingredient that is not fractional.**

Part 1: Ingredients	Doubled Ingredients		Part 2: Ingredients	Least Common Denominator
1/2 cup all-purpose flour	1 cup all-purpose flour		1/2 cup all-purpose flour	6/12
1/3 cup buttermilk	2/3 cup buttermilk		2/3 cup buttermilk	8/12
1/4 cup sugar			1/4 cup sugar	
3 ounces baking chocolate			3 ounces baking chocolate	Disregard
1/2 tsp. baking powder			1/2 tsp. baking powder	
1/3 cup applesauce			1/3 cup applesauce	
4 egg whites			4 egg whites	
2 tsp. vanilla extract			2 tsp. vanilla extract	
1/2 cup chocolate chips			1/2 cup chocolate chips	
1/3 cup chopped walnuts			1/3 cup chopped walnuts	

3)



Recipe Chart Assessment

Name: _____ **Date:** _____

4. **Find a recipe from the bookmarked Web site Cooking.com (http://cooking.com) that has 7 to 9 ingredients in fractional form.**

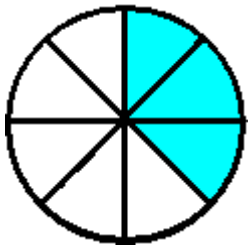
5. **Copy the fractional ingredients from the recipe into the *Ingredients* columns of the charts below.**

6. **Part 1: In the *Doubled Ingredients* column of the chart, write each ingredient, doubling the amount for each.**

7. **Part 2: Find the least common denominator for all fractional ingredients found in the *Ingredients* column and write each ingredient in this new form in the Least Common Denominator column. Write "disregard" for any ingredient that is not in fractional form.**

Part 1: Ingredients	Doubled Ingredients		Part 2: Ingredients	Least Common Denominator

Name _____



FRACTIONS LESSON:

How to Add Fractions

Objectives:

1. The student will be able to identify the numerator and denominator in a fraction.

2. The student will be able to determine the lowest common denominator between two and three fractions.

3. The student will be able to add fractions.

4. The student will be able to write fractions in simplest form.

Grade: Third Grade - Fourth Grade - Fifth Grade - Sixth Grade

Standards: NCTM Standards: 1, 6, 10

N am e_____
D ate_____

A Piece of the Pizza Pie How to Add Fractions

How many pieces of Pizza do you eat for dinner? One slice? Two slices? What fraction of a pizza is one slice? Assume that a full pizza contains six slices. You ate one piece of pizza out of a possible six pieces. This can be written as 1 out of 6 or as a fraction 1/6. (Fractions are written as the part over the whole.)

You can draw a picture to represent the one piece of the pizza that you ate. The shaded portion represents the one slice of pizza. Therefore, you ate 1/6 of the pizza.

What fraction represents two slices of the pizza? 2 slices out of 6 slices can be written as 2/6.

Question of the Day:
You're at a pizza party with 4 pizzas to choose from. Each pizza has 6 slices. You eat 2 pieces and your friend Jim eats 3 pieces.
1. What fraction of one pizza did you consume?
2. What fraction of all 4 pizzas did you consume?
3. Answer the same questions for Jim.
4. Finally, answer the same questions for the total amount that you and Jim consumed.

There are several parts to the question of the day. To solve this problem, let's first review the definitions of a numerator and denominator. We'll use a fraction of 4/8.

The **numerator** is the number above the fraction bar. Therefore, for the fraction 4/8, the numerator is equal to 4. The **denominator** is the number below the fraction bar. Therefore, for the fraction 4/8, the denominator is equal to 8. Understanding which numbers represent the numerator and denominator is important when adding and subtracting fractions.

Fractions also need to be written in **simplest form**. Simplest form means that you can no longer divide the same number equally into the numerator and the denominator.
For example, to simplify 4/8 you divide both the numerator and denominator by 4, which equals ½.
A fraction such as 23/30 is in simplest form because there is no number that will divide equally into both 23 and 30.

Let's answer the question of the day.
1. Each pizza has 6 slices. Therefore, you consumed 2/6 of one pizza. The fraction in simplest form would be 1/3.
2. If you have 4 pizzas each with 6 slices, then there are a total of 24 pieces of pizza. You consumed 2/24 of all 4 pizzas. The fraction in simplest form would be 1/12.

3. Jim consumed 3/6 of one pizza and 3/24 of all 4 pizzas. The fractions in simplest form would be ½ and 1/8.

4.We will need to add fractions to find the total amount both you and Jim consumed.
You ate 1/3 of a pizza while Jim ate ½ of a pizza. Therefore, you need to add 1/3 + ½, but how do you do this?

There are three steps you must follow in order to ADD fractions.
Step 1: The denominators must be the same number called the common denominator.

Find the lowest common multiple of each denominator.

In our example we had 1/3 + ½. The denominators are 3 and 2. The lowest common multiple of 3 and 2 is 6. Therefore, the common denominator is 6. Since you have changed the denominators you must also change the numerators.

Since you multiplied the denominator of 3 by 2 to get 6, you must multiply its numerator of 1 by 2. Therefore, 1/3 = 2/6.

You then convert ½ to 3/6. Now that both fractions have a common denominator you can add them together.

Step 2: Add the numerators, but keep the common denominator the same.
Therefore, 2/6 + 3/6 = 5/6.

Step 3: Write the fraction in simplest form if necessary.
5/6 is already written in simplest form since we can't divide the same number equally into both 5 and 6.

Let's practice adding fractions.

Number Problems:

1/8 + 4/8 = _____
(Answer: 5/8)
2/3 + 1/3 = _____
(Answer: 3/3. Simplest form is 1/1 or 1.)
23/52 + 10/52 = _____
(Answer: 33/52)
10/28 + 4/28 = _____
(Answer: 14/28. Simplest form is ½)

5/6 + ¾ = _____
(Answer: 10/12 + 9/12 = 19/12)
3/9 + 1/18 = _____
(Answer: 6/18 + 1/18 = 7/18)
4/8 + 1/4 = _____
(Answer: 4/8 + 2/8 = 6/8. Simplest form is ¾)
4/27 + 3/9 = _____
(Answer: 4/27 + 9/27 = 13/27)