

Food for Fractions

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Class: Math

School: Jessie Clark Middle School

Approximate Timeline: Spring 2003

School Level: Sixth and Seventh Grade

Area of Core Content: Mathematics

Organizer:

What is a fraction and how do I use it?

Targeted Standards:

Academic Expectation 2--Mathematics:

-2.7 Students understand number concepts and use numbers appropriately and accurately.

- Develop and apply number theory concepts (eg. Factors, primes, multiples).

-2.8 Students understand various mathematical procedures and use them appropriately and accurately.

- Apply and justify computational methods (calculator, paper-pencil, mental math, estimation, computer).

Academic Expectation 6--Integration of Knowledge:

-6.2 Students use what they already know to acquire new knowledge, develop new skills, or interpret new experiences.

- Evaluate strategies use to relate new information to prior knowledge and experience.
- Select an appropriate strategy to acquire specific new information.

Program of Studies--Middle School Mathematics:

-M-6-NC-1 continue to develop number sense including fractions, decimals, and percents (including percents greater than 100% and improper fractions).

-M-6-NC-2 extend understanding of operations (+, -, x, ÷) to include fractions and decimals.

-M-6-NC-6 determine prime numbers, composite numbers, factors, multiples, greatest common factors, and least common multiples.

-M-6-NC-7 extend and apply addition, subtraction, multiplication, and division of common fractions and decimals with manipulatives and symbols (e.g., mental, pencil and paper, calculators).

-M-8-NC-1 use percents, decimals, integers, and fractions (include percents less than 1).

Middle School Core Content--Mathematics:

- MA-M-1.1.1 Rational numbers (integers, fractions, decimals, percents)
- MA-M-1.1.6 Representation of numbers and operations in a variety of equivalent forms using models, diagrams, and symbols (e.g., number lines, 10 by 10 grids, rectangular arrays, number sentences)
- MA-M-1.2.1 Add, subtract, multiply, and divide rational numbers (fractions, decimals, percents, integers) to solve problems
- MA-M-1.2.2 Compute (e.g., estimate, use pencil and paper, use calculator, round, use mental math) large and small quantities and check for reasonable and appropriate computational results
- MA-M-1.2.4 Identify and use number theory concepts [prime numbers, prime factorization, composite numbers, factors, multiples, divisibility, greatest common factor (GCF), least common multiple (LCM) to solve problems.
- MA-M-1.3.1 How whole numbers, natural numbers, integers, fractions, decimals, percents, and irrational numbers (square roots and π only) relate to each other (e.g., convert between forms of rational numbers, compare, order)

Technology Standards

- T4.4.2 Access and navigate web sites
- T4.4.4 Use various web browsers
- T4.5 Navigate within an operating system or software
- T5.10 Use other electronic devices to process information

Essential Questions:

1. What is a fraction?
2. What are the pieces of a fraction and how can it be represented?
3. How do I add/subtract fractions (including mixed number) with like and unlike denominators?
4. How do I multiply and divide fractions (including mixed number)?

Culminating Performance:

Jessie Clark Middle School is planning a sugar potluck. Students will be divided into groups. Each group will have to convert a recipe to produce enough sugar treats for the entire class. Each group will also be responsible for calculating the amount of ingredients needed for the entire project and for each individual recipe. Once the recipes are converted, your group will combine the ingredients from each group to create one master grocery list. Each group will then make their recipe and share it with the class.

Scoring Guide

Level 4:

Recipe was correctly calculated and followed

Master grocery list was accurate
Student followed all directions clearly

Level 3:

Recipe was correctly calculated and followed
Master grocery list was mostly accurate
Student followed most directions

Level 2:

Recipe was calculated and followed with minor mistakes
Master grocery list was somewhat accurate
Student followed some directions

Level 1:

Student attempted to calculate and follow the recipe
Student attempted to make a master grocery list
Student followed a few directions

Knowledge:

factors	mixed numbers
inverse	LCD
reciprocal	GCF
adding	LCM
subtracting	Numerator
multiplying	Denominator
dividing	Fraction bar
multiples	Prime Factor
improper fractions	Problem solving

Skills/Abilities:

Measuring
Adding
Subtracting
Multiplying
Dividing

Critical Resources:

Instructional/Assessment Activities:

Review: divisibility rules and ordering

	Objectives	Activities	Assessment	Critical Resources
Pre-Test		Written worksheet		
Lesson 1: Prime numbers, composite numbers, and factors	Students will be able to identify prime and composite numbers and determine factors of whole numbers.	Factor Game; Sieve of Eratosthenes (all done in classroom)	Informal assessment through Factor Game	Factor Game: http://illuminations.nctm.org/imath/6-8/FactorGame/factor1.html PrimeTime (CMP Series)
Lesson 2: Greatest Common Factor	Students will be able to find the greatest common factor of a set of numbers.	Factor Trees and prime factorization (all done in classroom)	Independent completion and understanding of Factor Trees to get GCF (bookwork or worksheets)	Text Book
Lesson 3: Multiples and LCM	Students will be able to find the least common multiple of a set of numbers, determining the least common denominator.	Factor Trees and prime factorization (all done in classroom)	Independent completion and understanding of Factor Trees to get LCM (bookwork or worksheets)	Text Book
Lesson 4: Introduction to Fractions and their Parts	Students will identify parts of a fraction and understand visual representations	Grampy; Fraction Pie (all done in classroom)	Problems in textbook	Grampy: http://www.visualfractions.com/FindGrampy.html Fraction Pie: http://illuminations.nctm.org/mathlets/fractionpie/index.html
Lesson 5: Mixed numbers and improper fractions	Students will be able to change mixed numbers into improper fractions and vice versa.	Converting Exercises on www.aaamath.com . Students will take turns coming up to smart board to do converting exercises.	Independent practice in student workbook	TO: http://www.aaamath.com/B/fra57cx3.htm FROM: http://www.aaamath.com/B/fra57cx2.htm

		(all done in classroom)		
Lesson 6: Simplifying	Students will be able to reduce fractions and mixed numbers.	Kids Math Level 3 (computer lab); Fraction Frenzy (in-class activity with smart board)	Mid-Unit Review	Kids Math Level 3: http://www.kidsmath.com/e_int.htm ! Fraction Frenzy: http://www.learninplanet.com/sam/ff/index.asp
Lesson 7: Adding Fractions and Mixed Numbers	Students will be able to add fractions and mixed numbers with like and unlike denominators.	Whole class demonstration of adding fractions (http://www.visualfractions.com/) while students manipulate Cuisenaire Rods to make representations	Independent practice	http://www.visualfractions.com/) Cuisenaire Rods
Lesson 8: Subtracting Fractions and Mixed Numbers	Students will be able to subtract fractions and mixed numbers with like and unlike denominators.	Whole class demonstration of subtracting fractions (http://www.visualfractions.com/) while students manipulate Cuisenaire Rods to make representations	Independent practice	http://www.visualfractions.com/) Cuisenaire Rods
Lesson 9: Multiplying Fractions and Mixed Numbers	Students will be able to multiply fractions and mixed numbers.	Whole class instruction using http://www.coolmath4kids.com/lessons/fractions14.html and http://www.coolmath4kids.com/lessons/fractions15.html	Online assessment in computer lab: http://www.glencoe.com/sec/math/studytools/mac2lbr.shtml	http://www.coolmath4kids.com/lessons/fractions14.html and http://www.coolmath4kids.com/lessons/fractions15.html

		math4kids.com/lessons/fractions15.html		and http://www.glencoe.com/sec/math/studytools/mac2lbr.shtml
Lesson 10: Dividing Fractions and Mixed Numbers	Students will be able to divide fractions and mixed numbers.	Whole class instruction using http://www.coolmath4kids.com/lessons/fractions16.html and http://www.coolmath4kids.com/lessons/fractions17.html	Online assessment in computer lab: http://www.glencoe.com/sec/math/studytools/mac2lbr.shtml	http://www.coolmath4kids.com/lessons/fractions16.html and http://www.coolmath4kids.com/lessons/fractions17.html
Lesson 11: Portfolio Assessments	Students will be able to apply all acquired knowledge to successfully complete performance task.	6 th grade: Pizza Pirate 7 th grade: Number Line		
Post Test		Repeat Pre-Test		

Scoring Guide**Unit Title:** Fresh Baked Fractions**Culminating Performance:**

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Pizza Pirate

A class of students made a gigantic pizza for the class party to be held the day after final exams. They made the pizza a week before the party so that they could have time to study for exams. To keep the pizza fresh they put it in the school freezer for the week. Unfortunately, a pizza pirate was in the area. On the first night the pizza pirate came in and ate half of the pizza. On the second night, he ate half of what was left. Each night he came in and continued to eat half of what was left.

Determine the amount of remaining pizza left each night.
When the class of students went to get the pizza, what fraction was left?
Show evidence of how you arrive at a solution and verify your reasoning.

Nancy's Number Line

INSERT SCANNED IMAGE HERE!

- a) Which point on the number line is closest in value to $1\frac{1}{2}$?
- b) Suppose 20 is divided by the number represented by E on the number line. Estimate the quotient.
- c) Which point on the number line best represents the ratio of B to D?
Explain your reasoning.
- d) If the values represented by points C and D are multiplied, which point on the number line best represents the product? Explain your reasoning.

Fractions Pre/Post Test

Name: _____

Add:

$$\frac{3}{3} + \frac{1}{5} =$$

$$\frac{3}{3} + \frac{3}{6} =$$

$$\frac{5}{7} + \frac{3}{9} =$$

$$\frac{6}{7} + \frac{4}{7} =$$

Subtract:

$$\frac{1}{3} - \frac{1}{6} =$$

$$\frac{5}{6} - \frac{5}{9} =$$

$$\frac{5}{5} - \frac{7}{10} =$$

$$\frac{1}{1} - \frac{6}{7} =$$

Multiply:

$$\frac{1}{8} \times \frac{2}{6} =$$

$$\frac{1}{9} \times \frac{10}{10} =$$

$$\frac{1}{2} \times \frac{7}{10} =$$

$$\frac{2}{3} \times \frac{6}{9} =$$

Divide:

$$\frac{4}{5} \div \frac{7}{7} =$$

$$\frac{1}{1} \div \frac{5}{9} =$$

$$\frac{4}{9} \div \frac{10}{10} =$$

$$\frac{1}{10} \div \frac{7}{8} =$$

Reduce these fractions:

$$\frac{8}{10} =$$

$$\frac{5}{10} =$$

$$\frac{6}{15} =$$

$$\frac{3}{9} =$$

$$\frac{4}{12} =$$

Change each improper fraction to a mixed number:

$$\frac{9}{8} =$$

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

$$\frac{11}{6} =$$

$$\frac{8}{3} =$$

$$\frac{15}{7} =$$

Change each mixed number to an improper fraction:

$$- = 1 \frac{1}{7}$$

$$- = 1 \frac{2}{5}$$

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

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

Caramel Snookies

1 package (6 ounce) butterscotch chips
 1/2 cup water
 1/4 cup dark corn syrup
 2-1/2 cups vanilla wafer crumbs

1 cup chopped nuts
 1/2 teaspoon maple flavoring
 sugar

Melt chips over hot water; add water and syrup. Mix well and add crumbs, nuts and maple flavoring. Mix well and form into balls the size of a small walnut. Roll in sugar and store in a covered container for a few days to ripen.

Choco-Cream Hazelnut Balls

Makes 2 dozen balls

1/2 cup finely chopped hazelnuts
 1 cup vanilla cookie crumbs
 1 cup powdered sugar
 2 tablespoons cocoa

2 tablespoons corn syrup
 1/4 cup cream
 1/2 teaspoon vanilla

Combine all ingredients and mix well. The mixture should be moist to the touch. Roll into balls about the size of a walnut. Roll in powdered sugar or finely chopped hazelnuts. Store for at least 2 days in covered container.

Chocolate Bird Nests

Makes 1-1/2 dozen

2-1/2 cups chow mein noodles
 2 cups coarsely crushed cornflakes

3 cups (18 ounce) semisweet chocolate chips
 54 jelly beans in various colors

Line a large baking sheet with waxed paper.

In a large bowl, with your hands, toss together the noodles and cereal. In a medium saucepan set over low heat, melt the chocolate, stirring constantly until smooth. Pour over the noodle mixture and toss gently with a mixing spoon until evenly coated.

For each nest, mound 2 tablespoonfuls of the cereal mixture on the prepared sheet. With your fingers, make an indentation in each mound, shaping the mixture into nests. Press three jelly beans in each indentation. Set aside until firm, about 2 hours.

Crispy Chocolate Log

1 package large marshmallows -- 10 ounces
 1/4 cup butter
 1/4 cup peanut butter
 5 1/2 cups crispy rice cereal

1 1/3 cups semisweet chocolate chips
 3/4 cup butterscotch chips

Line a 15 x 10 x 1-inch pan with waxed paper; grease the paper and set aside. In a large microwave-safe bowl, combine the marshmallows, butter and peanut butter. Cover and microwave on high for 2 minutes; stir until well blended. Stir in cereal until well coated. Spread into prepared pan. In a microwave-safe bowl, combine chocolate and butterscotch chips.

Microwave, uncovered, on high for 2 minutes. Stir; spread over cereal mixture to within 1 inch of edges. Roll up jelly-roll style, starting with a short side, peeling waxed paper away while rolling. Place seam side down on a serving plate. Refrigerate for 1 hour or until set. Cut into 1-inch slices.

No-Bake Chocolate-Peanut Butter Yums

Makes 3 dozen

3/4 cup brown sugar
 16 ounces powdered sugar
 1/2 cup butter
 28 ounces chunky peanut butter

12 ounces semisweet chocolate chips
 1 tablespoon butter

Combine brown sugar, powdered sugar, 1/2 cup butter and peanut butter; mix well. Pat mixture into an ungreased 15 x 10-inch jelly-roll pan. Smooth top of mixture.

Melt chocolate and remaining 1 tablespoon butter in top of double boiler or microwave oven. spread melted chocolate on top of peanut butter mixture.

Refrigerate for 30 minutes to set chocolate. Before cutting into squares or triangles, allow to come to room temperature so chocolate will not crack. Store in refrigerator. These can be frozen.

No-Bake Layers

1/2 cup butter
 1 cup graham cracker crumbs
 1 cup coconut
 1 package (6 ounce) semisweet chocolate chips

1 package (6 ounce) butterscotch chips
 1 cup chopped nuts
 1 can (14 ounce) sweetened condensed milk

Melt butter in 13 x 9-inch pan. Top with layer of each remaining ingredient in order given. Chill; cut into bars.

No-bake Orange Balls

2 cups finely crushed ginger snaps
 3/4 cup flaked coconut

3/4 cup powdered sugar
 1/2 cup frozen, undiluted orange juice

Mix crumbs, coconut and powdered sugar. Add orange juice concentrate and mix well. Form into 1" balls. Roll in additional powdered sugar, if desired. Store in covered container.

Quick-Energy Pickups

Makes 30 cookies

4 square graham crackers
 1 cup powdered sugar
 1 cup crunchy peanut butter
 1 cup chocolate chips

1/2 cup instant dry milk
 3 tablespoons water

Crush crackers with your finger onto sheet of waxed paper. Mix remaining ingredients thoroughly in a bowl. Shape spoonfuls of the mixture into 1-inch balls. Roll the balls in the graham cracker crumbs until coated. Arrange the coated balls on ungreased cookie sheet and refrigerate about 20 minutes or until firm. Note: instead of graham crackers, you can use 1/2 cup prepared graham cracker crumbs or 2/3 cup flaked coconut.

Puddingwiches

Makes 15 cookies

1 1/2 cups cold milk
 1 package 4 ounce instant chocolate pudding mix

1/4 cup peanut butter -- to 1/2 cup
 15 whole graham crackers

In a mixing bowl, combine the milk, pudding mix and peanut butter. Beat on low speed for 2 minutes. Let stand for 5 minutes. Break or cut graham crackers in half. Spread pudding mixture over half of the crackers; top with the remaining crackers. Wrap and freeze until firm. May be frozen for up to 1 month.

Sticks and Stones Cookies

Makes 2-1/2 dozen

1 cup white, butterscotch, or chocolate chips
 1/4 cup light corn syrup
 2 tablespoons milk
 2 tablespoons butter
 1 teaspoon vanilla

5 cups Kix cereal
 1 cup broken pretzel sticks
 1/2 cup M&Ms baking pieces, optional

Cover cookie sheet with waxed paper; butter waxed paper. Heat which ever chips you choose, syrup, milk, butter and vanilla in 3-quart saucepan over low heat, stirring constantly, until chips are melted and mixture is smooth. Remove from heat; stir in cereal, pretzels and baking bits until well coated. Drop mixture by rounded tablespoonfuls onto waxed paper. Refrigerate about 2 hours or until firm. Store covered in refrigerator up to 3 days.