

Title: A Taste of Fractions

Link to Outcomes:

- **Problem Solving** Students will use problem-solving approaches to investigate and understand fractions in a cooperative atmosphere.
- **Communication** Students will communicate mathematically with charts, and diagrams, will write to reflect and clarify thinking, and will verbalize in cooperative groups.
- **Reasoning** Students will reason mathematically. They will use models and relationships to explain their thinking and justify their answers and solution processes.
- **Connections** Students will relate various representations of concepts to one another. They will use mathematics in their daily lives in cooking. This is connected to the social studies of Mexico, cultural traditions, economics, and health issues.
- **Estimation** Students will apply estimation when working with quantities and recognize when an estimation is appropriate.
- **Number Sense and Numeration** Students will construct number meanings through real-world experiences and the use of physical materials.
- **Fractions** Students will develop concept and number sense for fractions. They will use models to find equivalent fractions. They will apply fractions to problem situations.

Brief Overview:

These activities integrate the use of fractions with preparing food from another country. Students will be using charts, bar and circle graphs, and number lines to illustrate fractional parts of the whole. The students will prepare tacos according to their preferences and write about the tacos using fraction terms. The taco recipe may be modified by using package seasonings for the actual cooking.

Grade/Level:

Grade 3

Duration/Length:

This activity should take 6-7 days.

Prerequisite Knowledge:

- Students should be able to determine the ingredients of a taco.
- Students should have a concept of fractions as part/whole and mathematical vocabulary.

Objectives:

- Investigate fractions.
- Utilize charts and diagrams for problem solving.
- Interpret data using fractional terms.
- Utilize fraction models to identify preferences.
- Demonstrate that fractions are used in real-world situations.
- Display whole-class data on graphs.

Materials/Resources/Printed Materials:

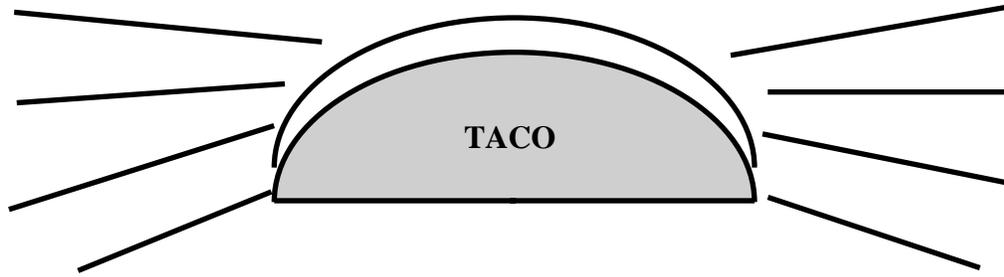
Per student or groups

- White, green, yellow, red, and brown construction paper
- 3x5 cards
- Post-its
- Scissors
- Chart paper
- Student resource sheets:
 - Taco Recipe (Student Resource #1)
 - How Much Do You Need (Student Resource #2)
 - Questions for Individual Reflection (Student Resource #3)
 - My Taco Tale (Student Resource #4)
 - The Ultimate Taco (Student Resource #5)
 - Rubric (Student Resource #6)
- Unifix cubes of 5 colors
- Circle pattern
- Journals
- Fraction manipulatives:
 - Pattern blocks
 - Cuisenaire rods
 - Fraction bars
 - Explorer Calculator
 - Circle fraction pieces
 - Protractors

Development/Procedures:

Days 1 and 2

Students will construct a survey graph as a class. This will enable the class to identify the locations of where each student's first taco experience took place. Use a *Think-Pair-Share* strategy to find out what students know about Mexican Food. Enhance background through reading a story or reference book about Mexico and the taco. Create a taco web (see possible graphic on next page) in a large group. Student Resource #1 contains a sample taco recipe.



Create a **First Taco Taste** bar graph. Give each student four colors of unifix cubes to represent home, school, other, or none. Ask students to pick one of the cubes, without showing anyone else, and to place it in an answer bucket. Empty the bucket, and ask the students to estimate how many of each there are. Ask for a way to justify the answer, and create a bar graph. Using another color of unifix cubes for the whole class (benchmark), compare and elicit fractional parts for each color. Use a number line, showing fractional values zero through one, i.e. $\frac{1}{4}$, $\frac{1}{3}$, $\frac{1}{2}$, etc. Create a class record by using precut squares of the four colors to make a graph for display.

Discuss with the students their first experiences with a taco and the ingredients. Ask questions similar to:

1. In comparison to the whole class (benchmark), was any group more or less than $\frac{1}{2}$? Is any group close to $\frac{1}{4}$, $\frac{1}{2}$, or $\frac{3}{4}$? Ask similar questions for other fractions. How do you know?
2. Can you say this in another way using fractional language?

Students end the lesson with journal writing about their first taco experience and their explanation of the graph including where they are in the fractional part of the whole class.

Writing prompt: Write a letter to a friend to inform him about the first time you remember eating a taco. In your letter include the completion of this sentence: "When we were in class today, I found out I was part of the (fraction) of my class that ate a taco at (place) for the first time."

Days 3 and 4

Students will complete a chart which identifies fractional values when adapting a recipe for various serving amounts.

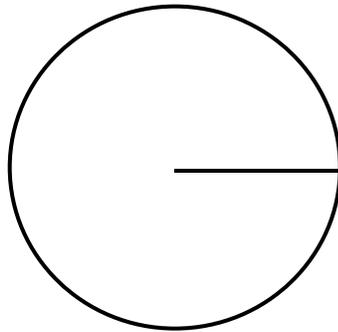
Refer to the taco web from the previous day to review the ingredients needed to make tacos. Identify the main ingredients. In groups of two to six, students will complete the **How Much Do You Need?** worksheet (Student Resource #2).

Reflection questions (Student Resource #3) will evaluate their group and individual thinking.

Day 4

Students will create a graphic representation of taco preference using colored-paper circle cut-outs.

The students will cut circles of equal sizes, one of each color (white-taco shell, red-tomato, brown-meat, green-lettuce, yellow-cheese). Cut each circle on the radius (see diagram), stack on top of each other, then turn to interlock. The students should move the colored pieces to represent their own preference of taco fillings and how they plan to make their taco. (You might want to glue in place.)

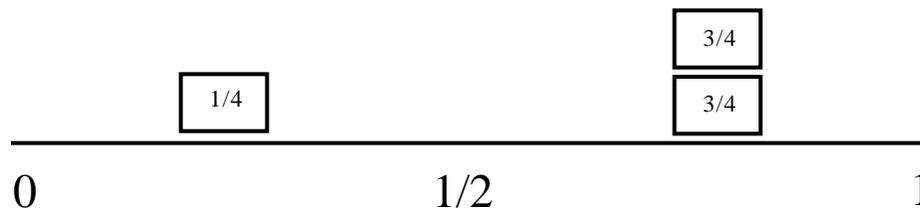


Day 5

Each student will create his own taco according to his graphic, and then eat his taco. Students will write and describe their tacos using measurement and fraction terms. See **My Taco Tale** (Student Resource #4).

Days 6 and 7

Students will sequence their graphic representations of their tacos prepared the previous day according to fractional parts of meat, cheese, lettuce, and tomato. The students will assign a fraction representation for each ingredient on a color-coded square of construction paper (see previous day) and place the values on a number line. Use the number line as a basis for a bar graph.



The students will use the four food number line/bar graphs to draw conclusions about the various amounts of ingredients used in filling tacos. It may be helpful to the students to make a frequency table of the fractions for each food number line. They will write and draw their ideas of a typical class taco and compare that with their own (See Student Resource #5).

Evaluation:

Using the written and visual graphic representations, the teacher and students will apply a rubric for evaluation (Student Resource #4).

Extension/Follow Up:

Extensions from the bar graph

Students will make a circle graph by color-coding equal-sized squares on a paper strip. The ends will be connected to form a circle with the colors on the inside. The circle is marked from the center to where each color begins, then colored appropriately.

Extension from fractions

- Convert fractions to decimals.

Extension

- Find the cost of making tacos.
- Study food groups and nutritional values.
- Research the spices as natural resources.

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Recipe for Basic Taco

1 pound ground beef	1 onion, chopped
Taco sauce	1 1/2 teaspoons chili powder
1 1/2 teaspoons Worcestershire sauce	3/4 teaspoon dried whole oregano
1/2 teaspoon pepper	1/4 teaspoon dried whole rosemary, crushed
1 teaspoon garlic salt	2 1/2 cups shredded lettuce
1/2 teaspoon paprika	1 cup (4 ounces) shredded cheddar cheese
1/4 teaspoon ground cumin	
12 flour tortillas (soft shell)	
2 tomatoes	

Combine beef and onion in a skillet; cook over medium heat until beef is browned, stirring to crumble. Drain. Stir in 3 tablespoons taco sauce, the Worcestershire sauce, and seasonings; simmer 5 minutes or until heated. Place meat, lettuce, tomatoes, and cheese by tablespoons in each tortilla, and add 1 to 2 tablespoons taco sauce. Yield: 6 servings.

Recipe adapted from Southern Living, 1983 Annual Recipes. Oxmoor House, Inc., Birmingham, Alabama, pg. 199.

Name _____

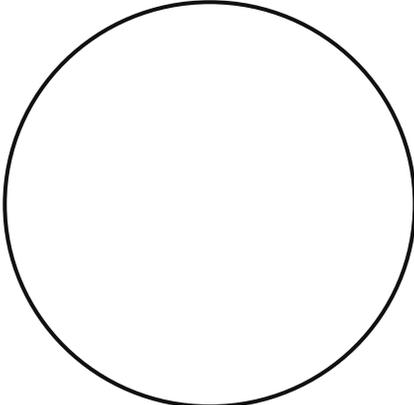
How Much Do You Need?**Using the Taco Recipe, complete the chart below.**

# of TACOS	MEAT	CHEESE	LETTUCE	TOMATOES
6				
	1 lb.	4 oz.	2 1/2 cups	2
24				
# in your group (1 Taco each) _____				

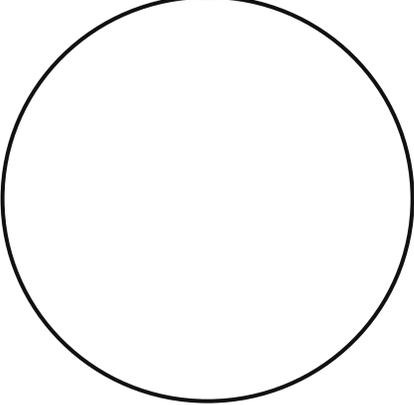
Name _____ Date _____

The Ultimate Taco!

Using the information from the class bar graphs, describe the ultimate class taco and compare it with your own. Which do you like better and why? Support your decision. Complete the circle graphs to show the ultimate class taco and your ultimate taco.



Class Taco



My Taco

RUBRIC

Assignment _____ Date _____

Level	Standard to be achieved for performance at specified level
<p style="text-align: center;">4 Well Done</p>	<ul style="list-style-type: none"> * I showed my thinking with pictures, number sentences, etc. * I used a lot of math language. * I used complete sentences to explain my thinking. * I solved the problem correctly and gave extra information.
<p style="text-align: center;">3 Acceptable</p>	<ul style="list-style-type: none"> * I showed my thinking with pictures, number sentences, etc. * I used some math language. * I used complete sentences to explain my thinking. * I used the information correctly.
<p style="text-align: center;">2 Revision Needed</p>	<ul style="list-style-type: none"> * I showed my thinking, but I had some mistakes. * I did not use sentences to explain my thinking. * Some of my information was correct.
<p style="text-align: center;">1 Begin Again</p>	<ul style="list-style-type: none"> * My thinking did not relate to the problem. * I did not use sentences to explain my thinking. * I used the information incorrectly.

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