I'm Hungry! Let's Share

Summary

The students will be able to: Divide geometric shapes into two, three, or four parts of equal objects and identify the parts as halves, thirds, or fourths.

Main Core Tie

Mathematics Grade 2
Strand: GEOMETRY (2.G) Standard 2.G.3

Materials

      Pizza box
      Two cardstock or cardboard pizzas
      Scissors
      Tape or magnets
      Prepared word strips (see the *Share My Pizza* lesson)
   - *OneHalf* chart (pdf)
     , enlarge
      Two sets of class paper plates.
      Glue
      Construction paper
      White board markers
      Crayons
      Student math journals
   - Two Peanut Butter Sandwich pictures (pdf)
     , cardstock optional
      Lunch bag
   - *OneFourth* chart (pdf)
     , enlarged
   - *Mmm . . .* worksheet (pdf)
     , class set
   - *Divide the Bread* worksheet (pdf)
     , class set
   - *OneThird* chart (pdf)
     , enlarged
   - *Crackers* (pdf)
     , class set
      Enlarged single copies of geometric crackers from *Crackers* -- square, circle, triangle, hexagon, and rhombus
      A second enlarged copy of the square geometric cracker
Books:
   - *Give Me Half!*
     , by Stuart J. Murphy, ISBN: 0064467105
   - *Fraction Fun*
     , by David A. Alder, ISBN: 083413411
   - *Apple Fractions*
     , by Jerry Pallotta, ISBN: 0439389011

- *Full House: An Invitation to Fractions*
  , by Dayle Ann Dodds, ISBN: 0763624682
- *Riddleiculous MATH*
  , by Joan Holub, ISBN: 0807549964
- *GO, Fractions!*
  , by Judith Bauer Stamper, ISBN: 0448431130
- *Math in the Kitchen*
  , by Ellen Weiss, ISBN: 0531187845
- *Inchworm and a Half*
  , by Elinor J. Pinczes, ISBN: 0618311017
- *Each Orange Had 8 Slices: A Counting Book*
  , by Paul Giganti, Jr., ISBN: 0688139858
- *The Doorbell Rang*
  , by Pat Hutchins, ISBN: 0688092344
- *Eating Fractions*
  , by Bruce McMillan, ISBN: 0590437704
- *Making Fractions*
  , by Andrew King, IBSN: 076130732X
- *Shoe Box Math Learning Centers*
  , by Scholastic, IBSN: 0439205743
- *Link 'n' Learn*
  , by Carol A. Thornton & Judith K. Wells, ISBN: 1569119929

Organizations:

NCTM, [National Council of Teachers of Mathematics](#)

Background for Teachers

Teachers need to have a general understanding of fractions to teach these lessons. Pertinent vocabulary needed includes denominator, numerator, fourths, halves, and thirds. Extensions of this activity include teachers dividing sets of objects into different fractions. A general understanding about geometric shapes is also needed.

Olga Kosheleva Irina Lyublinskaya at the University of Texas at El Paso College of Staten Island argued in her findings that understanding of fractions significantly improves when students are offered opportunities to investigate fractions in new contexts.

In these lessons, teachers will be demonstrating the meaning of fractions with the use of common food items in a child's life, further enhancing students' understanding of fractions.

Intended Learning Outcomes

Understand and use basic concepts and skills.

Develop problem solving skills.

Make connections from content areas to application in real life.

Instructional Procedures

Invitation to Learn:

This lesson is introduced by having a pizza box delivered to the classroom. Prepare a cardstock or cardboard representation of a pizza in a box. Comment about the perfect timing of the delivery, because everyone is getting hungry. Say this pizza is too much for you to eat, so you decide to share it with one other person in the room. Choose a person to come up to the front of the room with you. Open up the box and take out the pizza. Cut it in obvious unequal halves. Ask the student which

piece they would like to have. Hopefully, they will pick the larger piece.

Instructional Procedures:

I'm Hungry! Share My Pizza

Begin this lesson by reading the book, *Give Me Half*. Have a brief discussion about the story and how it relates to the students.

Have a discussion about the pizza that was delivered to the classroom and the unequal pieces shared with a student. Include the fact that the pizza was cut unfairly for sharing with someone else.

Ask how the students would feel if they got the smaller piece?

How would they feel if they got the bigger piece?

During the discussion, bring out the point that some people would not feel they were being treated fairly, whether they got the small piece or big piece of pizza. People feel better when items, such as pizza, are shared equally and fairly.

Talk with the class about what a "fair share" of the pizza would look like if it were divided equally. Have another cardboard pizza ready in the box.

Call another student up to the front of the room. Have the student divide (cut) the pizza in half, as equally and fairly as possible, with scissors.

Post the two halves for all the class to see.

Ask the student to take his/her seat.

Ask the class: "Is this a fairer way to share a pizza with a friend

Make word strips from the following sentences and place them on the board next to the posted pizza halves:

I have one whole pizza.

I want to share it equally with one other person.

Each of us will get onehalf of the pizza.

Discuss with the class the words "onehalf."

Place the *OneHalf chart* with its word, symbol, and pictorial representation on the front board. (See *OneHalf* sheet)

Tell students that they are going to make their own pizza today.

Pass out a paper plate (the cheap ones that are easy to cut through) to each child. Let students spend about eight minutes coloring what their pizza looks like.

When the time is up, have students take a pair of scissors and cut through the plate to share it equally in two.

Have students glue only the top part their pizza onto a piece of construction paper, slightly separating the two halves. The two halves should be able to flip up, revealing the underside of the plate.

Have students turn up their pizzas and write "onehalf" and "½" on each half.

Ask: "How many pizzas do you have?" (One.)

Discuss with the students that, yes, in deed, there is only one pizza. It is cut in half.

Consequently, there are two halves, and together they make one whole pizza.

Say: "Onehalf plus onehalf equals one whole" and write on the board: ½ + ½ = 1

Have students draw and color a pizza in their math journals.

Students should divide their pizza in half by drawing a line through the middle of it. Demonstrate that the line can be vertical, horizontal, or diagonal as long as the line goes *through the middle*.

You might want to hold a pizza, with a line drawn down the middle, rotating it around to different positions and asking if the pizza is still cut in two in the various positions.

Students can take the paper plate pizza home and share what they have learned today with their families.

I'm Hungry, Share My Sandwich

Put two cardstock *Peanut Butter Sandwich* pictures (pdf) in a brown paper bag. You may get the colored version of this sandwich from Wikipedia listed under "peanut butter sandwich."

Tell the students you are hungry and ask if there is anyone who would like to share a sandwich with you.

Choose three students to come up to the front of the room.

Take out one of the sandwiches and, with scissors, cut it unequally in fourths. Place it on the plate.

Ask the students to choose which piece that they would like to eat. It doesn't matter which piece each student chooses. Remind all students, this is similar to the lesson about sharing the pizza equally.

Ask: "How fair is the cut or division of the sandwich?"

Now take out the other *Peanut Butter Sandwich* picture.

Ask one of the students to cut the sandwich in four equal pieces so the four of you can share the sandwich equally.

Remind students that one of the pieces of sandwich is for themselves. This is an important and difficult concept for students to grasp.

After the student has cut the sandwich in fourths, say "Thanks for being fair," take your piece and pretend to eat it. "Mmm . . . good!"

Explain the sandwich was cut into "fourths."

Write "¼" and "onefourth" on the white board.

Ask: "How many whole sandwiches did the four of us have?" (One.)

Important concept: Help students to understand that even though there are four pieces, there is only one sandwich. All the pieces are parts of the one whole sandwich.

Explain that it doesn't matter if the shape is a circle like the pizza or is a square like the sandwich. The fraction is the same as long as the item is cut or shared equally.

Place the *OneFourth chart* (pdf) with its word, symbol, and pictorial representation on the front board.

Explain the *OneFourth chart* to the students.

Let the students know they will be dividing a paper sandwich into four equal parts.

Pass out a copy of the *Mmm . . ., worksheet* (pdf) and have students color and cut out the bread, cheese, lettuce, and ham.

Demonstrate and then have students cut the bread slice into fourths.

Place the bread parts on a paper plate like a puzzle, slightly pulling the four pieces apart. Glue pieces in place.

Students should cut each of the cheese, lettuce, and ham pictures in four equal parts.

Set each cheese part on top of a bread part, again, slightly pulling the four pieces of cheese apart at the center. Glue in place.

Repeat this process with the lettuce and ham.

Students should write "¼" and "Onefourth" beside each piece of sandwich.

Write on the board: ¼ + ¼ + ¼ + ¼ = 1

Then ask students to think of another way to cut the bread into fourths.

Pass out a copy of *Divide the Bread* (pdf) worksheet to each student. Instruct each student to think of the way we have already cut the bread and draw it on number 1 bread.

Now think of other ways to divide the bread into fourths and to draw them on number 2, 3, and 4.

Have students share with a partner.

Have a class discussion and demonstration using enlarged pictures of the bread. Some of the ways are vertical, horizontal, diagonal and "t" cut (the usual cut).

After the discussion, have students draw a slice of bread in their math journals and diagonally "cut" it with a crayon or pencil, depending on how they like their sandwich cut.

Now have the student write the following prompt: "Today I learned how to share a square sandwich in four equal parts. I shared my sandwich with . . ."

Walk around the room and check for accuracy, informally assessing and correcting as needed.

An extension of this activity would be to use a subway, hoagie sandwich or a hot dog on a bun -- showing a rectangular shaped sandwich. This will help assess student understanding of fractions.

Home connection: Students should take home their sandwich on the paper plate and share with their family what they learned about cutting one sandwich into four equal parts.

I'm Hungry! Share My Crackers

For this lesson you will need enlarged copies of geometric outlines of crackers on colored paper representing different crackers. (See *Crackers* sheet (pdf)). The shapes chosen are from the second grade math core, Standard 3, Objective 1.a. You may want to laminate the enlarged cracker shapes. Place the shapes in a large box, similar to a pizza box. Decorate the box top like a box of crackers.

Begin the lesson by telling the students you are hungry. Ask them if anyone would like to share some crackers with you.

Choose two students to come up to the front of the room.

Show the cracker box and take out the enlarged square cracker shape.

Ask one of the students to draw lines on the cracker to show three equal pieces. If laminated, you may use a wipeoff marker.

Ask the class if they know what fraction this is. (1/3)

Have the student cut a separate enlarged square cracker into thirds copying the lines already drawn. Place the cracker on the white board with the pieces slightly separating the thirds.

Write "1/3" and "onethird" beside each piece on the white board.

Now take out the circle cracker and tell the students this cracker will be a bit more challenging to divide into thirds.

Ask one of the students to draw a line to make three equal pieces. The student may ask for help from the class.

Remind students they are sharing the pieces of cracker with two other people and that one of the pieces is for themselves. Repeating this concept helps students understand this important and difficult concept.

After the student has drawn lines to cut the cracker into thirds, say "Thanks," take your piece and pretend to eat it. "Mmm . . . good!"

Repeat the cracker was cut into "thirds."

Show the circle cracker again and ask: How many whole crackers am I holding in my hand? (One)

Write on the board: 1/3 + 1/3 + 1/3 = 1

Again, emphasize this important concept: Even though there are three pieces, there is only one cracker. All the pieces are parts of the one whole cracker.

Post the *OneThird* chart (pdf) with its word, symbol, and pictorial representation on the front board.

Discuss the *OneThird* chart with the students.

Have the students go back to their seats.

Show the students there are three more crackers in the box: a rhombus, hexagon, and triangle.

Put the enlarged crackers on the white board and write their names beside each figure.

Hand out a copy of *Crackers* to student. Students can work in pairs or individually.

Instruct students to divide each cracker into thirds by drawing lines on the crackers. Students can refer to the chart if needed. Note: The triangle and hexagon can be a bit tricky to divide into thirds. There are several options for dividing each shape; let the students explore various ways.

Have students label each cracker piece with "1/3" and "onethird."

Students should write in their math journals, using the following prompt: "I divided crackers today. I chose the_____ cracker shape. It can be shared equally into thirds." (Have students draw the specified shape, divide it into thirds, and label the diagram).

Lesson and Activity Time Schedule:
Each lesson is 55 minutes.
Each activity is 30 minutes.
Total lesson and activity time is 90 minutes.

Activity Connected to Lesson:

I'm Hungry!: Baker for a Day
Before this lesson, place four cans of play dough in each of six empty cake boxes from a bakery. Put a note in each box that tells students the baker has run out of time to make this cake. The ingredients for the "dough" have been placed in the box with a note stating the order in which they are used.

Sample instructions:
Use ½ of the white dough to make a round cake layer.
Use ¼ of the red dough for a strawberry sauce layer and place it on top of the cake layer.
Use the other ½ of the white dough to make a second cake layer and place it on top of the strawberry sauce.
Use 1/3 of the blue dough and roll a thin, flat layer for icing on top of the whole cake.
Use ¼ of the yellow dough and make a design on the cake by rolling long stringlike pieces and placing them on the icing in designs.

Each set of instructions should vary slightly to make them look different, for example: square layered cake, rectangle layered cake, use various colors for the icing, make flowers on the cake, etc.

Start the activity by discussing with the students that it is now their turn to practice what they have learned with fractions as if they were a cake baker.

Divide the class into six teams. Assign each team a place in the room to work preferably a table or a group of desks.

Ask students wash their hands as if they were real bakers before they begin.

Tell the groups they will find inside each cake box, a set of instructions using fractions to make a cake.

Follow the instructions carefully.

Walk around the room, answering questions as students make their cakes.

Have students record the activity in their math journal by dividing a page into fourths with their pencils. Have them draw their cakes in one section, write the fractions they used in another section, write what colors they used in the third section, and write a threesentence story about their cake in the last section.

This would be a great activity for taking pictures of teams working with the play dough. Then post the pictures on a board with a caption such as "Baker for a Day."

Activity Materials:
Six sets of four small containers of play dough -- four different colors
Six empty cake boxes from a local bakery
Six sets of "baking" instructions -- vary the instructions slightly, see activity example above
Student math journals
Pencils
Crayons
Camera -- optional

Extensions

For <u>English Language Learners</u>, have native language word strips naming the various parts of these lesson activities, i.e. pizza, sandwich, crackers, onehalf, one-fourth, onethird. Students can draw their own pictures and use simplified language in their math journals.

- <u>Advanced learners</u>
can go beyond the three fractions in the lessons, including 1/5, 1/6 and 1/8 in their activities. They can shade various pieces in a single sandwich to show 2/3, ¾, 2/5, 3/5, 4/5, etc. Students can also make simplified addition/subtraction problems like: ¼ + ¾ = 1.

- <u>For practice</u>
, check out this [website](#) for many activities involving fractions for second graders.

- <u>Practice</u>
fractions by reading the poem, "Plenty of Pizza" in the book, *Riddleiculous MATH*. Have students answer the riddles in the book. Extend this activity to include writing by asking students to write a poem about fractions using a different food topic, possibly cookies, fruits, sandwiches, candy bars, etc.

For <u>more practice ideas</u>, the Illuminations website from NCTM listed under Web Sites has six really great lessons on coins, complete with student activity pages.

Family Connections:

Assignments to do with parents:

Help a parent or older sibling make cookies or other food item paying special attention to the recipe which uses fractions.

Share a food item with a family member by cutting it in halves, thirds, or fourths.

Take the worksheets home used in this lesson and teach siblings and/or parents what is learned in the activities. Be sure to have family members ask questions about the fractions learned.

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