

Constructing Task: Making a Cake

Approximately 2 Days



STANDARDS FOR MATHEMATICAL CONTENT

MCC.2.G.2 Partition a rectangle into rows and columns of same-size squares to find the total number of them.

MCC.2.G.3 Partition circles and rectangles into two, three, or four equal shares, describe the shares using the words halves, thirds, half of, a third of, etc., and describe the whole as two halves, three thirds, four fourths. Recognize that equal shares of identical wholes need not have the same shape.

STANDARDS FOR MATHEMATICAL PRACTICE

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

*****Mathematical Practices 1 and 6 should be evident in EVERY lesson*****

BACKGROUND KNOWLEDGE

(Information quoted from Van de Walle and Lovin, Teaching Student-Centered Mathematics: Grades 3-5, page 138)

“Students should come to think of counting fractional parts in much the same way as they might count apples or other objects. Students who understand fractional parts should not need to arrange pie pieces into a circle to know that four-fourths make a whole. For each collection, tell students what type of piece is being shown and simply count them together: “*one-fourth, two-fourths, three-fourths, and four-fourths*. As students count each collection of parts, discuss the relationship to one whole.”

ESSENTIAL QUESTIONS

- Why is it important to identify, label, and compare fractions (halves, thirds, fourths) as representations of equal parts of a whole or of a set?
- How do you know how many fractional parts make a whole?

MATERIALS

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- *My Half Day* by Doris Fisher or similar book
- Play-dough
- Circular Sheet
- Rectangular Sheet
- Chart paper
- Markers
- Craft stick
- Job descriptions (Students can refer to these to help them remember their role)
- Task Cards (copies for each group to have one task card)

GROUPING

Large group, Small group

TASK DESCRIPTION, DEVELOPMENT, AND DISCUSSION

Part I

Begin by reading a book similar to *My Half Day* written by Doris Fisher, or *Apple Fractions* by Jerry Pallotta to the class. Use fraction circles to model sharing a pie with a small group of students in the class. You can also make copies of the fractions found within the book – enlarge them on the copy machine. Display each as you read about it in the book.

Part II

After a discussion, have students get into groups. Assign students jobs:

- The Recorder is the person who is in charge of managing the writing that goes on the chart.
- The Materials Collector is the person who is in charge of getting the materials needed and putting the materials up after the task is complete.
- The Reporter is be the person who is in charge of sharing the strategies their group used and any other information they would like to share about discoveries their group made.

Encourage students that although they have certain “jobs” everyone participates and works cooperatively helping one another.

Have groups select one task card. They are to read the situation and determine a solution to the task. Students may use cake pans, play dough, and craft sticks to act out the scenario. Students should also share their thought processes through numbers, pictures, and words.

While students are working on the task using the materials provided, circulate the room and ask questions like:

- How many people must share your cake?
- How will you separate your cake into equal pieces?

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- What if everyone wanted two pieces, how would this change the fraction of each piece?
- Would that change the amount each person received? Why or Why not?
- Can you explain this process through words?

Part III

Allow students to share their task and solution. Have students show their work and explain the strategies they used. Discuss the differences in the sizes of the pieces based on the shape of the cake and the number of ways the cake had to be split. Ask students which cake they would rather be sharing. Allow students in the audience to ask questions, make comments, and give suggestions.

FORMATIVE ASSESSMENT QUESTIONS

- How many people must share your cake?
- How will you separate your cake into equal pieces?
- What if everyone wanted two pieces, how would this change the fraction of each piece?
- Would that change the amount each person received? Why or Why not?
- Can you explain this process through words?

DIFFERENTIATION

Extension

- Present students with this problem and the extension handout: I have a rectangle cake that I want to share with 4 friends. How many different ways can you cut the cake into fourths?
- How would I cut the cake if each of my friends wanted more than two pieces (e.g. 3, 4, or more)?

Intervention

Allow students to review the identification of fractions through the website: pbskids.org/cyberchase/games/fractions/index.html to play “13 Ways to a Half”



Making a Cake: Task Cards

Task Card #1

Make a rectangle cake and imagine you want to serve the whole thing to three people.

How could you cut your cake to assure that each person had the same amount of cake?

What fraction would each person get to eat? Use pictures, words, and numbers to explain your answers.

Task Card #2

Make a rectangle cake and imagine you want to serve the whole thing to four people.

How could you cut your cake to assure that each person had the same amount of cake?

What fraction would each person get to eat? Use pictures, words, and numbers to explain your answers.

Task Card #3

Make a circle cake and imagine you want to serve the whole thing to three people.

How could you cut your cake to assure that each person had the same amount of cake?

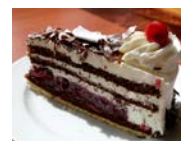
What fraction would each person get to eat? Use pictures, words, and numbers to explain your answers.

Task Card #4

Make a circle cake and imagine you want to serve the whole thing to two people.

How could you cut your cake to assure that each person had the same amount of cake?

What fraction would each person get to eat? Use pictures, words, and numbers to explain your answers.



Making a Cake: Job Descriptions

Job Descriptions: These could be copied and given to each group so they remember their “job” within the group.



The Recorder is the person who is in charge of managing the writing that goes on the chart.



The Materials Collector is the person who is in charge of getting the materials needed and putting the materials up after the task is complete.



The Reporter is the person who is in charge of sharing the strategies their group used and any other information they would like to share about discoveries in their group.