Constructing Task: Birthday Cookout

STANDARDS FOR MATHEMATICAL CONTENT

MCC4.NF.4 Apply and extend previous understandings of multiplication to multiply a fraction by a whole number.

a. Understand a fraction *a*/*b* as a multiple of 1/*b*. *For example, use a visual fraction model to represent 5/4 as the product 5 × (1/4), recording the conclusion by the equation 5/4 = 5 × (1/4).*

b. Understand a multiple of *a*/*b* as a multiple of 1/*b*, and use this understanding to multiply a fraction by a whole number. *For example, use a visual fraction model to express 3 × (2/5) as 6 × (1/5), recognizing this product as 6/5. (In general, n × (a/b) = (n × a)/b.)*

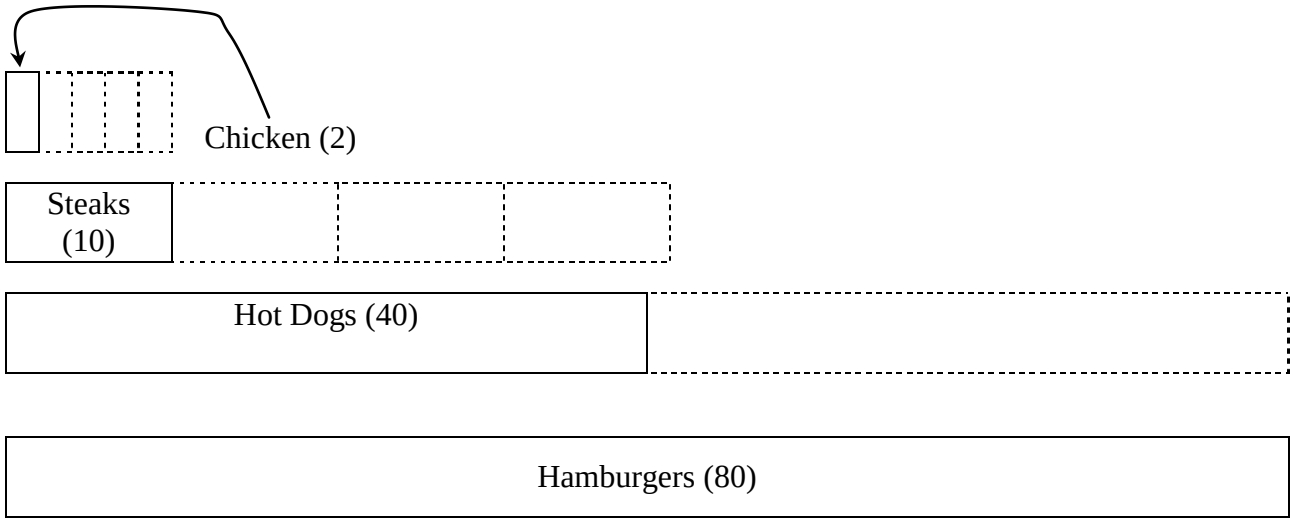
c. Solve word problems involving multiplication of a fraction by a whole number, e.g., by using visual fraction models and equations to represent the problem. *For example, if each person at a party will eat 3/8 of a pound of roast beef, and there will be 5 people at the party, how many pounds of roast beef will be needed? Between what two whole numbers does your answer lie?*

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.

BACKGROUND KNOWLEDGE

You may want to review problem solving strategies with your students as they begin work on this task. Strategies such as making a table and working backward are two approaches to this task. Another suggestion for solving fraction word problems such as this is to utilize the Singapore Math strategy of drawing bars that are proportionate to the values in the problem. For example, we know that 80 people ordered hamburgers so we can draw a large bar to represent the hamburgers. We can then draw a bar ½ the size of our "hamburger" bar to represent the number of people that want hotdogs. Next we can draw a bar that is ¼ the size of our "hot dog" bar to represent the number of people that want steak. Finally, we can draw a bar ⅕ the size of our "steak" bar to represent the number of people that want chicken.



ESSENTIAL QUESTIONS

- How can we use fractions to help us solve problems?
- How can we model answers to fraction problems?
- How can we write equations to represent our answers when solving word problems?

MATERIALS

- "Birthday Cookout" student recording sheet

GROUPING

Partner/Small Group Task

TASK DESCRIPTION, DEVELOPMENT AND DISCUSSION

This task asks students to use problem solving strategies and their knowledge of fractions to solve a real-world problem involving food for a birthday party.

Comments

The setting of this task is likely a familiar one for students. You may want to begin with a discussion of how math is used when planning a birthday party. The discussion may include a wide range of mathematical ideas such as number of invitations, amount of food, and the amount of money needed to purchase food.

Solutions are given below:

- How many people asked for chicken? (1/5 of 10 is 2)
- How many people asked for steak? (1/4 of 40 is 10)
- How many asked for hot-dogs? (1/2 of 80 is 40)

Task Directions

Have students follow the directions on the "Birthday Cookout" student recording sheet.

FORMATIVE ASSESSMENT QUESTIONS

- What problem solving strategies will you use to solve this problem?
- What models will you use to determine what the chef needs to know?
- How are you using fractions to help solve this problem?

DIFFERENTIATION

Extension

- Have students research and determine the cost of the items the chef needs.
- Have students create their own menu and create a new problem involving fractions.
- Have students determine the percentage of guests who chose each menu item.

Intervention

- Use smaller numbers, for example instead of 80 hamburgers, use 40 hamburgers.
    - How many people asked for chicken? (1/5 of 5 is 1)
    - How many people asked for steak? (1/4 of 20 is 5)
    - How many asked for hot-dogs? (1/2 of 40 is 20)

Name _____ Date _____

Birthday Cookout

Bob turned 60 this year! His family celebrated by having a cookout. Marcy took orders and found one fifth as many people wanted chicken as wanted steaks, one fourth as many people wanted steaks as wanted hot dogs, and one half as many people wanted hot dogs as wanted hamburgers. She gave her son-in-law, the chef, an order for 80 hamburgers.

The chef needs more information. He has to know:

- How many people asked for chicken?
- How many people asked for steak?
- How many asked for hot-dogs?

Use words, pictures and numbers to tell the chef what he needs to know. Be prepared to share!