

Sugar Cookies

Description

Using models to represent a baking challenge, students connect their knowledge of addition and multiplication of whole numbers to addition and multiplication of fractions.

Mathematics

The context of making multiple batches of a recipe introduces multiplication of a fraction by a whole number and allows students to make a connection to repeated addition as a strategy for multiplication of fractions. A mixed number adds complexity to the problem, which may lead students to combine several strategies to reach a solution. Students can connect their fraction number sense to their whole number sense through the models.

Curriculum Connections

Students will:

- translate between equivalent forms of a number (i.e., improper fraction and mixed number);
- demonstrate the relationship between the repeated addition of fractions and the multiplication of a fraction by a whole number;
- use estimation when solving problems involving operations with whole numbers and fractions;
- solve problems involving multiplication with fractions and whole numbers.

Instructional Sequence

1. Ask students to estimate the total amount of flour required to make five batches if one batch of a recipe calls for $\frac{3}{8}$ cup of flour.
2. Discuss estimation strategies, recording on chart paper for reference.
3. Distribute BLM 1. Allow time for students to complete the task. Make manipulatives available for students to use. Probe and extend student thinking using the key questions.
4. Consolidate thinking as a class by recording and explaining all the different strategies (refer to the sequence included in Student Thinking document).

Highlights of Student Thinking

Students may:

- use repeated addition of whole numbers, then repeated addition of $\frac{3}{4}$, and combine those answers;
- model each of the seven sets, then combine parts to create wholes;
- break $\frac{3}{4}$ into unit fractions and multiply the unit fraction by 21 (3×7);
- use a combination of strategies (i.e., multiplication for whole numbers, repeated addition for fractions); and
- convert $1\frac{3}{4}$ into an improper fraction to multiply.

Key Questions

1. Is your estimate reasonable? Why or why not?
2. How does your model help represent the problem?
3. Is there another model that can better represent the problem?

Materials

- BLM 1 (one copy per student)
- Chart paper & markers
- 1 cup measuring cup
- $\frac{1}{4}$ cup measuring cup
- Dry measuring material (i.e., sand)
- manipulatives (i.e., unit cubes, relational rods)