Constructing Task: Sweet Fraction Bars

STANDARDS FOR MATHEMATICAL CONTENT

MCC4.NF.3 Understand a fraction a/b with $a > 1$ as a sum of fractions $1/b$.

a. Understand addition and subtraction of fractions as joining and separating parts referring to the same whole.

b. Decompose a fraction into a sum of fractions with the same denominator in more than one way, recording each decomposition by an equation. Justify decompositions, e.g., by using a visual fraction model. *Examples: 3/8 = 1/8 + 1/8 + 1/8 ; 3/8 = 1/8 + 2/8 ; 2 1/8 = 1 + 1 + 1/8 = 8/8 + 8/8 + 1/8.*

d. Solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators, e.g., by using visual fraction models and equations to represent the problem.

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

Students should have experience working with adding and subtracting fractions and using a number line, an area model, and a set model. Also, students should be able to record the operation using fractional notation. Eggsactly and Tile Task should have provided students a chance to decompose fractions using a set model and an area model. With this task students will only use the denominator of 10.

ESSENTIAL QUESTIONS

- How can you use fractions to solve addition and subtraction problems?
- What happens to the denominator when I add fractions with like denominators?

MATERIALS

- "Sweet Fraction Bars, Story Problems" student recording sheet
- "Sweet Fraction Bars, Ten-Frames" student recording sheet

GROUPING

Individual/Partner Task

TASK DESCRIPTION, DEVELOPMENT, AND DISCUSSION

In this task, students will be given problems to solve involving a candy bar divided into ten equal sections.

Comments

Students may use a ten-frame or a number line to solve these problems. Alternatively, students may choose to use math pictures to solve the problems. Allow students to choose a model that makes sense to them. As students work, look for strategies that students use that may be beneficial to other students. Allow students who used these helpful strategies to share their thinking during the summary part of the lesson.

Task Directions

Students will follow the directions below from the "Sweet Fraction Bars" student recording sheet below.

A Sweet Fraction Bar is a chocolate candy bar that is divided into ten equal sections. Solve the following problems.

1. Hannah had $\frac{7}{10}$ of a Sweet Fraction Bar. She gave $\frac{3}{10}$ of the candy bar to Carlos. How much of the candy bar does she have left?
2. Sarah has $\frac{5}{10}$ of a candy bar. Brianna has $\frac{3}{10}$ of the same candy bar. Also, Mika has $\frac{2}{10}$ of the same candy bar. Together do the girls have enough to equal a whole candy bar?
3. Marissa gave Paulo $\frac{4}{10}$ of a Sweet Fraction Bar. Michael gave Paulo $\frac{3}{10}$ of a Sweet Decimal Fraction bar. How much candy does Paulo have now?
4. Caleb had $\frac{9}{10}$ of a Sweet Fraction Bar. He gave Mika $\frac{6}{10}$ of the candy bar. How much of the candy bar does he have left?

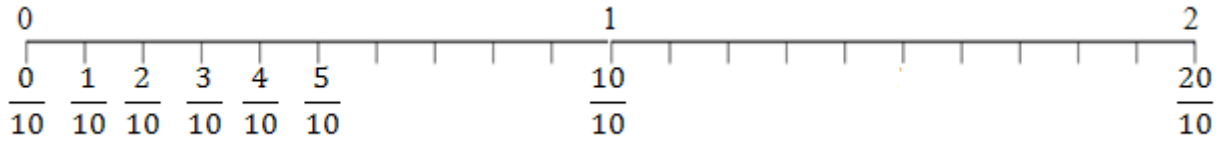
FORMATIVE ASSESSMENT QUESTIONS

- Does the story involve combining or taking away? How do you know?
- How many tenths of a candy bar do you have in all? How many tenths of a candy bar do you have left? How do you know?
- Can you show what happened in the story on a number line? Using the ten-frames? Using a set of counters? In a math picture?
- How many tenths would you need to equal a whole candy bar? How many tenths do you have?

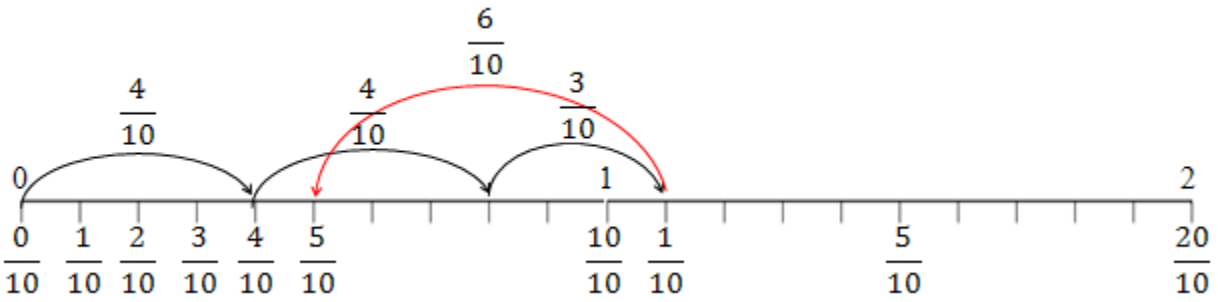
DIFFERENTIATION

Extension

- Ask students to create an addition and a subtraction problem. Have students solve the problems on the back of the paper.
- Give students four numbers and a target number (e.g. $\frac{4}{10}, \frac{6}{10}, \frac{4}{6}, \frac{3}{10}$; target number $\frac{5}{10}$).
  Ask students to use the number line below to show an addition/subtraction sequence that would result in the target number.



For this example, students could show the following.



$$\frac{4}{10} + \frac{4}{10} + \frac{3}{10} - \frac{6}{10} = \frac{5}{10}$$

This problem was adapted from the following website.
http://nlvm.usu.edu/en/nav/frames_asid_107_g_2_t_1.html?from=category_g_2_t_1.html

Intervention

- Allow students to act out the problems with a partner or in a small group. Students may cut the ten-frames and use the fractional pieces when acting out the stories.

Name _____ Date _____

Sweet Fraction Bars

Story Problems

A Sweet Fraction Bar is a chocolate candy bar that is divided into ten equal sections. Solve the following problems.

1. Hannah had $\frac{7}{10}$ of a Sweet Fraction Bar. She gave $\frac{3}{10}$ of the candy bar to Carlos. How much of the candy bar does she have left?	2. Sarah has $\frac{5}{10}$ of a candy bar. Brianna has $\frac{3}{10}$ of the same candy bar. Also, Mika has $\frac{2}{10}$ of the same candy bar. Together do the girls have enough to equal a whole candy bar?
3. Marissa gave Paulo $\frac{4}{10}$ of a Sweet Fraction Bar. Michael gave Paulo $\frac{3}{10}$ of a Sweet Fraction bar. How much candy does Paulo have now?	4. Caleb had $\frac{9}{10}$ of a Sweet Fraction Bar. He gave Mika $\frac{6}{10}$ of the candy bar. How much of the candy bar does he have left?

Name _____ **Date** _____

Sweet Fraction Bars

Ten-Frames