DIVISION  5.NF.7
Word Problems - Division of Unit Fractions & Whole Numbers

**Purpose:** To illustrate of division by unit fractions and whole numbers

**Materials:** Fraction Bars, pencils and paper

### TEACHER MODELING/STUDENT COMMUNICATION

**Activity 1 Examples of dividing unit fractions by whole numbers**

1. Pose the following problem.

   ➢ How much chocolate will each person get, if 3 people share ½ pound equally?

   **a.** How can the information in this problem be represented by a visual fraction model? (Using bars, ½ pound of chocolate can be represented by a ½ bar.)

   ![Fraction model for ½ pound of chocolate](image)

   **b.** How can the ½ bar be used to determine the fraction of a whole pound of chocolate each person received? (Split the shaded amount of the bar into 3 equal parts)

   ![Splitting ½ bar into 3 equal parts](image)

   **c.** Each person will get one of these 3 parts of chocolate. How can we determine what fraction of a pound of chocolate each person will receive? (Use a 1/6 bar to show how much each person gets; or, split the unshaded part of the ½ bar into 3 equal parts to show that 1/3 of ½ is 1/6.)

   ![One part out of 6](image)

   **d.** How can the amount of chocolate each person receives be expressed as a division equation? (1/2 ÷ 3 = 1/6)

2. How can a visual fraction model be used to represent the information in this problem?

   ➢ A relay race that is 1/3 mile will be run by 4 fifth graders. How far will each person run if their distances are equal?

   **a.** The 1/3 mile can be represented by a 1/3 bar. Splitting each part of the bar into 4 equal parts shows that ¼ of the shaded amount is 1/12 of the whole bar. How far will each person run? (1/12 mile.)

   ![Splitting 1/3 bar into 4 equal parts](image)

   **b.** Write a division equation to express 1/3 divided by 4. (1/3 ÷ 4 = 1/12.)
Activity 2 Examples of dividing whole numbers by unit fractions

1. How many 1/3-cup servings are in 2 cups of raisins?
   a. Represent each cup of raisins by a whole bar and the 1/3 cup by a 1/3 bar.

   b. How many times does the shaded amount of the 1/3 bar fit into: 1 whole bar? (3 times); 2 whole bars? (6 times)
   c. How many 1/3-cup servings are in 2 cups of raisins? (6 servings)
   d. Write a division equation to express 2 divided by 1/3. (2 ÷ 1/3 = 6)

2. How can a visual fraction model be used to represent the information in this word problem?
   If grampa has 4 cups of cocoa and each batch of cookies uses 1/6 cup of cocoa, how many batches can he make? (Use 4 whole bars to represent 4 cups of cocoa and a 1/6 bar to represent 1/6 cup of cocoa.)
   a. How many times does the shaded amount of the 1/6 bar fit into: 1 whole bar? (6 times); 4 whole bars? (24 times)
   b. How many batches of cookies can be made with 4 cups of cocoa? (24 batches)
   c. What is the division equation to express 4 divided by 1/6. (4 ÷ 1/6 = 24)

Activity 3 Creating word problems

1. Ask students to sketch one of the following bars for unit fractions and to imagine the shaded amount of the bar represents part of some amount (1/2 of a pie, or 1/3 of a cake, etc). Then ask them to make up a word problem that involves sharing half of this amount and to write a division equation to express their unit fraction divided by 2.

2. Ask students to sketch 3 whole bars and to imagine they represent 3 whole amounts of some quantity (3 pizzas, or 3 bags of popcorn, etc). Then ask them to select one of the above bars for a unit fraction to represent the same amount (½ of a pizza, or 1/3 of a bag of popcorn, etc). Finally, ask them to make up a word problem about the number of times the amount for their unit fraction bar fits into the amount for 3 whole bars and to write a division equation to express 3 divided by the unit fraction.

INDEPENDENT PRACTICE and ASSESSMENT

Worksheet 5.NF.7  #3