

LESSON 20: Multiply Fractions

MODELING

Multiply Fractions and Whole Numbers - Concrete and Pictorial

Step 1: Direct students' attention to Problem 1.

- Partner A, identify the problem. ($3 \cdot \frac{1}{6}$)

Remind students about the wording for multiplication from the Warm-Up. (**groups** of **items**)

- Partner B, explain the meaning of the problem. (3 groups of $\frac{1}{6}$) Record.

Step 2: Next, have partners build 3 groups of $\frac{1}{6}$ with their fraction kits as you use the overhead fraction strips to model. Draw a picture of the **model** on T595 as shown below as students record on S197.



- Partner A, identify what the picture shows. (3 groups of $\frac{1}{6}$ or $\frac{3}{6}$)
- Partner B, determine if we can legally trade $\frac{3}{6}$ for fewer pieces of all one color. (Yes, $\frac{1}{2}$)

Record the **product** in Column 1 as students record: $3 \cdot \frac{1}{6} = \frac{3}{6} = \frac{1}{2}$.

Step 3: Direct students' attention to Problem 2.

- Partner A, identify the problem. ($\frac{3}{5} \cdot 2$)

Remind students about the wording for multiplication from the Warm-Up. (groups of items)

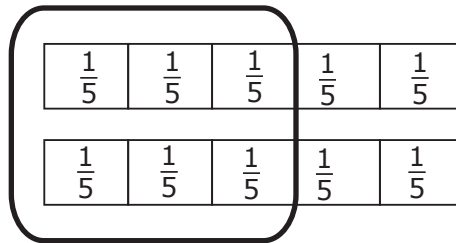
- Partner B, explain the meaning of the problem. ($\frac{3}{5}$ of a group of 2) Record.

LESSON 20: Multiply Fractions

Step 4: Model for students how to build $\frac{3}{5}$ of a group of 2 on the overhead.

- Have Partner A and Partner B work together to build 2 using their $\frac{1}{5}$ fraction pieces.

Draw a picture of the fraction bars in the Model column.



Model how to circle $\frac{3}{5}$ of each group.

- Partner A, identify what the picture shows. ($\frac{3}{5}$ of a group of 2 or $\frac{6}{5}$)
- Partner B, what kind of fraction is $\frac{6}{5}$? (improper)
- Partner A, explain how to legally trade the $\frac{6}{5}$. (trade for 1 whole and $\frac{1}{5}$)

Model how to legally trade $\frac{6}{5}$ for $1\frac{1}{5}$. Record the answer in Column 1 as students record: $\frac{3}{5} \cdot 2 = \frac{6}{5} = 1\frac{1}{5}$.

3 minutes – CP, IP:

Have students work in partners to complete Problems 3–6 on S197. **{Verbal Description, Concrete Representation, Pictorial Representation, Graphic Organizer}**

1 minute – WG:

Have students come back together as a class and share their results. They should be able to justify the results using their fraction strips as needed. **{Verbal Description, Concrete Representation, Pictorial Representation, Graphic Organizer}**

Multiply Fractions by Fractions - Concrete and Pictorial

(12 minutes – M, WG, GP, CP, IP) T597, S198 (Answers on T598.)

8 minutes – M, WG, GP, CP:

Have students turn to S198 in their books, and place T597 on the overhead. Have students continue to work in partners. Each partner should use his or her own fraction kit. Use the following activity to help students investigate multiplying fractions by fractions. **{Verbal Description, Pictorial Representation, Graphic Organizer, Concrete Representation}**

LESSON 20: Multiply Fractions

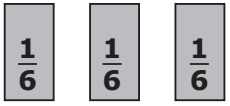
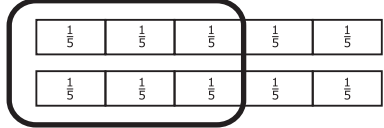
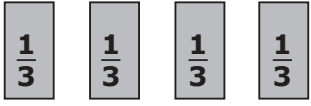
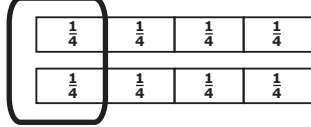

Here is the key to **S197**.

Directions: Complete the following SOLVE problem with your teacher. You will only complete the S step.

Danielle is working on a design for her art project. The design is made up of rectangles and triangles. There are a total of 24 rectangles in the design, and each rectangle has a width of $\frac{1}{2}$ -inch and a length of $\frac{3}{4}$ -inch. What is the area of each of the rectangles?

- S** Underline the question.
 This problem is asking me to find **the area of each rectangle**.

Directions: Complete this page with your teacher and partner.

Problem	Meaning	Model
1. $3 \cdot \frac{1}{6} = \frac{3}{6} = \frac{1}{2}$	3 groups of $\frac{1}{6}$	
2. $\frac{3}{5} \cdot 2 = \frac{6}{5} = 1\frac{1}{5}$	$\frac{3}{5}$ of a group of 2	
3. $4 \cdot \frac{1}{3} = \frac{4}{3} = 1\frac{1}{3}$	4 groups of $\frac{1}{3}$	
4. $\frac{1}{4} \cdot 2 = \frac{2}{4} = \frac{1}{2}$	$\frac{1}{4}$ of a group of 2	
5. $2 \cdot \frac{2}{5} = \frac{4}{5}$	2 groups of $\frac{2}{5}$	
6. $\frac{2}{6} \cdot 3 = \frac{6}{6} = 1$	$\frac{2}{6}$ of a group of 3	