MULTIPLICATION 5.NF.4
Multiplying Fractions Times Fractions

Purpose: To multiply fractions times fractions and compute products by canceling

Materials: *Fraction Bars*, dry erase markers, and copies of activity sheet "Multiplying Fractions from *Fraction Bars*" (attached)

TEACHER MODELING/STUDENT COMMUNICATION

Activity 1 Multiplying fractions times fractions

Fraction Bars

dry erase markers

1. Show students and have them find a 1/3 *Fraction Bar* and demonstrate how to take 1/2 of 1/3 by using a dry erase marker to split each part of the bar into 2 equal parts.

$1/2 \times 1/3 = 1/6$

➢ One of these new split shaded parts is 1/6 of a *Fraction Bar* because a whole bar now contains 6 equal parts. The resulting product is $1/2 \times 1/3 = 1/6$.

pencils and paper

➢ Select any bar with just one part shaded. Explain how the bar can be used to find 1/2 of the fraction for the bar. Write the multiplication equation. Lines from dry erase markers can be wiped off.

$1/2 \times 1/4 = 1/8$

➢ Find the green bar for 1/2 and explain how to use this bar to find 1/3 of 1/2. Write the resulting multiplication equation. (Split each part into 3 equal parts. One of the new shaded parts equals 1/6 because there are now 6 equal parts in a whole bar. $1/3 \times 1/2 = 1/6$)
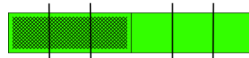
$$\frac{1}{3} \times \frac{1}{2} = \frac{1}{6}$$

Discuss the fact that 1/2 of 1/3 is equal to 1/3 of 1/2 and this is an example of the commutative property. In this case $1/2 \times 1/3 = 1/3 \times 1/2 = 1/6$.

➢ Use your 1/2 *Fraction Bar* and show how to take 2/3 of the shaded amount. Remember, taking 2/3 of something means to divide it into 3 equal parts and take 2 of the new parts.
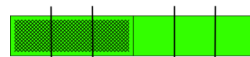
$$\frac{2}{3} \times \frac{1}{2} = \frac{2}{6}$$

copies of Multiplying Fractions from *Fraction Bars*

2. Distribute copies of "Multiplying Fractions from *Fraction Bars*." If a copy of this activity sheet is projected, students can illustrate drawing lines on the bars to take parts of the shaded amounts and explain their reasoning.

3. Summarizing to see relationships and generalizations. List the above multiplication equations in one spot to help students compare and look for relationships.

(1) $\dfrac{1}{2} \times \dfrac{1}{3} = \dfrac{1}{6}$ (2) $\dfrac{1}{2} \times \dfrac{1}{4} = \dfrac{1}{8}$ (3) $\dfrac{1}{3} \times \dfrac{1}{2} = \dfrac{1}{6}$ (4) $\dfrac{2}{3} \times \dfrac{1}{2} = \dfrac{2}{6}$

a. Study these multiplication equations and state a generalization for multiplying a fraction times a fraction. **(Multiply the numerator times the numerator and the denominator times the denominator.)**

b. Look for other relationships and patterns in these four equations. (1) In each product we are multiplying by a fraction less than 1; (2) In each product, the answer is less than the number being multiplied. For example, in $1/2 \times 1/3 = 1/6$, the product 1/6 is less than 1/3.

c. Discuss the fact that multiplying by fractions less than 1 results in taking part of something, so the product is always less than the number being multiplied.

Pencils
and paper

Activity 2 Computing products by canceling

1. Ask students to compute the product $2/3 \times 7/12$ and write the answer in lowest terms. ($2/3 \times 7/12 = 14/36 = 7/18$)

➢ Compute the same product using canceling. Discuss the convenience of canceling.

$$\dfrac{\cancel{2}^{1}}{3} \times \dfrac{7}{\cancel{12}_{6}} = \dfrac{7}{18}$$

2. Write this product: $5/6 \times 9/10$.

➢ Sometimes it is possible to cancel more than once. Compute this product by canceling.

$$\dfrac{\cancel{5}^{1}}{\cancel{6}_{2}} \times \dfrac{\cancel{9}^{3}}{\cancel{10}_{2}} = \dfrac{3}{4}$$

INDEPENDENT PRACTICE and ASSESSMENT

Worksheets 5.NF.4 #4 and #5

fractionbars.com Set 2
Two-Par Golf (Players compute with the four basic fraction operations to hit the golf ball. The game has just started here, and Dylan has teed off from the first hole. If Dylan computes the sum of fractions correctly, the ball will go onto the green and into the hole. Incorrect answers may cause the golf ball to go into various types of hazards.)

PLAYER	1	2	3	4	5	6	7	8	9	TOTAL
Dylan	1	0	0	0	0	0	0	0	0	1
Jayden	0	0	0	0	0	0	0	0	0	0

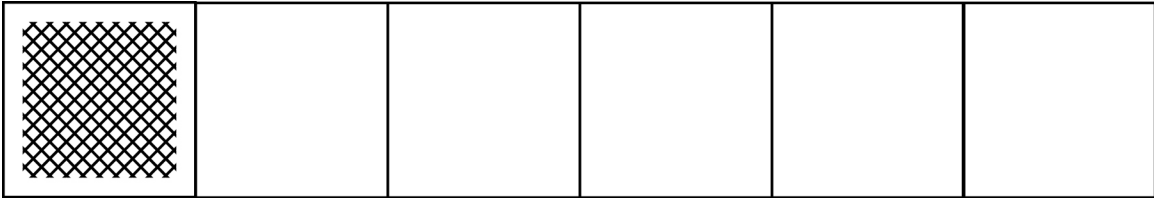Dylan, type the answer to: $\dfrac{5}{6} + \dfrac{1}{4}$ and click the ball.

AUDIO ON

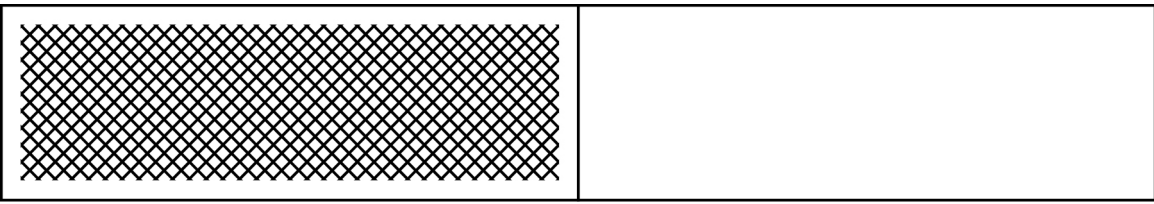Activity Sheet "Multiplying Fractions from Fraction Bars"

Draw lines on each part of the bar to determine the fraction of the shaded amount. Then complete the equation. Use your deck of bars, if needed.
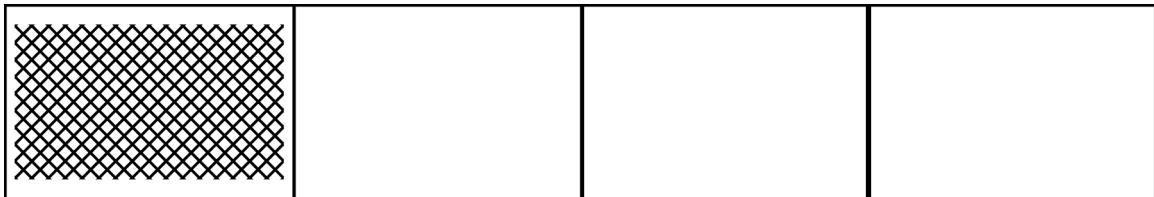
1a.

$\frac{1}{2}$ of $\frac{1}{6}$ = $\frac{1}{2} \times \frac{1}{6}$ =

1b.

$\frac{1}{4}$ of $\frac{1}{2}$ = $\frac{1}{4} \times \frac{1}{2}$ =

1c.

$\frac{2}{3}$ of $\frac{1}{4}$ = $\frac{2}{3} \times \frac{1}{4}$ =

1d.

$\frac{3}{4}$ of $\frac{1}{3}$ = $\frac{3}{4} \times \frac{1}{3}$ =