TOPIC 2

LESSON 2.2a

Did You Get The Part

6.NS.1

Objective Multiplying and Dividing with Fractions

Warm-Up

Write the least common multiple (LCM) of the numbers in each pair

1. 3, 4

WORKED EXAMPLES

	1	2	3	4	5
3:	3×1= **3**	3×2= **6**	**9**	**12**	**15**
4:	4×1= **4**	4×2= **8**	**12**	**16**	**20**

LCM is 12

2. 2, 4

3. 8, 3

GETTING STARTED

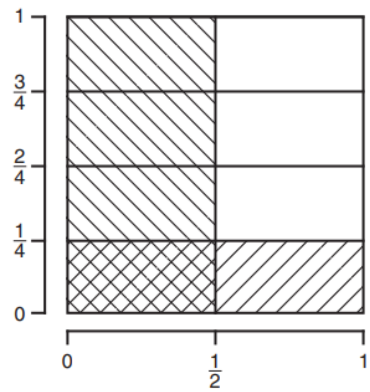
Return of the Area Model

Previously, you used an area model to represent products, to determine factors, and to list multiples of given numbers. In the same way that area models represent whole number multiplication, area models can represent fraction multiplication.

WORKED EXAMPLE

The expression $\frac{1}{4} \times \frac{1}{2}$ means to multiply $\frac{1}{4}$ and $\frac{1}{2}$. When you multiply a fraction by a fraction, you are calculating a part of a part. You can represent the product of two fractions using an area model. Let's consider an area model for $\frac{1}{4} \times \frac{1}{2}$ and what it represents.

To represent $\frac{1}{4}$ along one side of the model, divide the model into four equal parts along the vertical line. Then shade $\frac{1}{4}$.



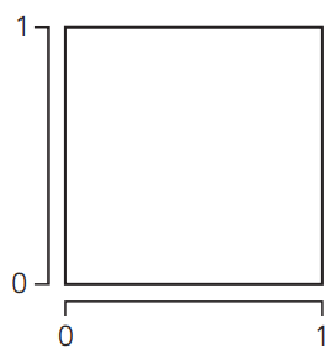
To represent $\frac{1}{2}$ along one side of the model, divide the model into four equal parts along the vertical line. Then shade $\frac{1}{2}$.

$\frac{1}{4} \times \frac{1}{2} = \frac{1}{8}$

The area of the overlapping region is the product of the fractions.

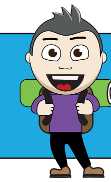
1. Estimate the product $\frac{1}{4} \times \frac{1}{2}$

2. Represent the product using the area model.



EXPLORE 1

Multiplying with Mixed Numbers



Let's look at two methods for multiplying mixed numbers.

Dawson is thinking about how to determine $3\frac{2}{3} \times 2\frac{1}{4}$ He is trying to remember a model he used when he learned how to multiply whole numbers.

He multiplied 25 × 34 first to remember the method, and then applied the same strategy to multiply the mixed numbers.

Dawson

25 × 34

	30	4
20	600	80
5	150	20

$$\begin{array}{r} 600 \\ 150 \\ 80 \\ +\ 20 \\ \hline 850 \end{array}$$

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

	2	$\frac{1}{4}$
3	6	$\frac{3}{4}$
$\frac{2}{3}$	$\frac{4}{3}$	$\frac{2}{12}$

$$\begin{array}{rcl} & & 6 \\ \frac{3}{4} & = & \frac{9}{12} \\ \frac{4}{3} & = & \frac{16}{12} \\ +\frac{2}{12} & = & \frac{2}{12} \\ \hline \end{array}$$

$$= 6 + \frac{27}{12} = 6 + 2\frac{3}{12}$$

$$= 6 + 2\frac{1}{4} = 8\frac{1}{4}$$

1. Describe the model Dawson used to calculated the product of two mixed numbers.

2. Lezlee's correct method is shown. Describe how she calculated the product of two mixed numbers.

Lezlee

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

$\frac{11}{3} \times \frac{9}{4} = \frac{99}{12}$

$= \frac{33}{4}$

$= 8\frac{1}{4}$

3. Which method do you prefer, Lezlee's or Dawson's? Why

Hawaiian Trail Mix Extravaganza
$3\frac{2}{3}$ cups of macadamia nuts
$2\frac{1}{4}$ cups of pumpkin seeds
$3\frac{3}{8}$ cups of dried cherries
$4\frac{5}{8}$ cups of popped popcorn
$1\frac{2}{3}$ cups of corn syrup
$2\frac{1}{3}$ cups of almonds
$1\frac{1}{3}$ cups of sunflower seeds
$2\frac{5}{6}$ cups of honey
$4\frac{1}{2}$ cups of raisins
$2\frac{3}{4}$ cups of granola

4. The sixth grade teachers are each going to make 3 batches of Hawaiian Trail Mix Extravaganza. For each ingredient,
first use one of these common benchmark fractions ($\frac{1}{4}, \frac{1}{2}, \frac{3}{4}, 1$) to estimate how many cups of each are needed.
Then calculate the exact answer. Show your work.

a. almonds Estimate: ____________

b. popped popcorn Estimate: ____________

c. macadamia nuts Estimate: ____________

5. There are more seventh grade students than sixth grade students. The seventh grade teachers determine that they are each going to make $4\frac{1}{2}$ batches. For each ingredient, first estimate how many cups of each are needed. Then calculate the exact answer. Show your work.

a. raisins Estimate: ____________

b. sunflower seeds Estimate: ____________

c. pumpkin seeds Estimate: ____________

Name: ______________________ Date: ____________ Class: __________

Homework HW

LESSON 2.2a

Did You Get The Part

Objective Multiplying and Dividing with Fractions

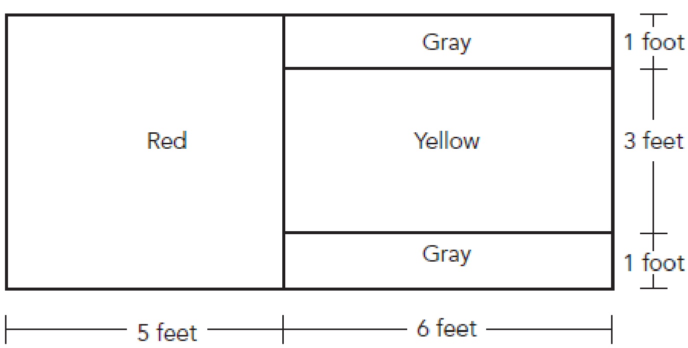
Review

1. A school participates in a reading contest. The table shows each sixth grade class's portion of the grade's total reading minutes. Order the classes from the greatest number of reading minutes to the least. Explain your reasoning.

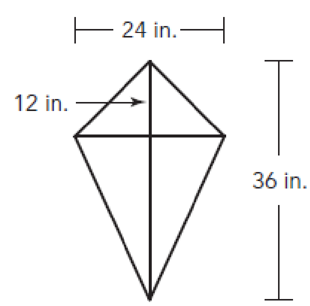
Class	Portion of Reading Minutes
Mr. Karlie	$\frac{5}{12}$
Ms. Jacobs	$\frac{1}{18}$
Ms. Suarez	$\frac{4}{9}$
Mr. Mitchell	$\frac{1}{12}$

2. Order the fractions $\frac{3}{7}$, $\frac{4}{5}$, $\frac{5}{9}$ and $\frac{1}{8}$ from least to greatest. Explain your method.

3. An artist is weaving a rectangular rug to match the pattern shown in the figure. Calculate the area of the entire rug.



4. You are making a kite out of nylon fabric. Study the diagram. How much nylon fabric will you need to make the kite?



5. Estimate and then calculate each product.

a. 625 × 34 b. 1014 × 59