Chapter 4
Lesson 4.3 & 4.4

Multiplying Improper Fractions and Mixed Numbers
Chapter 4 Lesson 4.1

Problem of the Lesson

Use models to help you find \( \frac{2}{5} \) of \( \frac{3}{4} \).
Chapter 4 Lesson 4.2

Problem of the Lesson
Sheila wants to bake 6 muffins but her recipe is for 12 muffins. This means she will only need half of the ingredients listed in the recipe. How much of each ingredient does she need?

Ingredients
- 1 cup banana chips
- 7 tablespoons oil
- 2 eggs
- \( \frac{3}{4} \) cup flour
- \( \frac{1}{4} \) cup walnuts
Multiplying Improper Fractions by Fractions

Lesson Objective

- Multiply improper fractions by proper fractions.

Vocabulary

- proper fraction
- improper fraction
Multiply improper fractions by proper fractions.

Find the product of $\frac{6}{5}$ and $\frac{3}{4}$.

$\frac{6}{5} \times \frac{3}{4} = \frac{3}{4} \times \frac{6}{5}$

In $\frac{3}{4}$, the numerator is less than the denominator. $\frac{3}{4}$ is a **proper fraction**.

In $\frac{6}{5}$, the numerator is greater than the denominator. $\frac{6}{5}$ is an **improper fraction**.

$\frac{18}{20} = \frac{9}{10}$
Method 2

\[
\frac{6}{5} \times \frac{3}{4} = \frac{6 \div 2}{5} \times \frac{3}{4 \div 2}
\]

\[
= \frac{3 \times 3}{5 \times 2}
\]

\[
= \frac{9}{10}
\]

Divide both the numerator and denominator by their common factor, 2.
Multiply. Express the product in simplest form.

1. \( \frac{1}{3} \times \frac{7}{5} \)
2. \( \frac{2}{7} \times \frac{21}{12} \)
Multiply. Express the product as a whole number or a mixed number in simplest form.

3 \[ \frac{3}{7} \times \frac{14}{5} \]

4 \[ \frac{5}{9} \times \frac{24}{7} \]
\[ \frac{9}{4} \times \frac{10}{3} \]  

\[ \frac{7}{5} \times \frac{9}{2} \]
7. \( \frac{27}{6} \times \frac{15}{8} \)

8. \( \frac{16}{3} \times \frac{9}{4} \)
Chapter 4 Lesson 4.3

Problem of the Lesson

Use models to help you find the product of $\frac{5}{4}$ and $\frac{1}{3}$.
Lesson 4.4

Multiplying Mixed Numbers and Whole Numbers

Lesson Objectives

- Multiply a mixed number by a whole number.
- Compare the size of a product to the size of its factors.

Vocabulary

mixed number
Multiply **mixed numbers** by whole numbers.

There are 6 students in a group. Each student works $1\frac{1}{2}$ hours on a group project. What is the total amount of time they spend working on the project?

**Method 1**

There are 6 groups of $1\frac{1}{2}$

Then there are 6 groups of $\frac{3}{2}$

9 groups of 1

The group works on the project for a total of 9 hours.
Method 2

\[ 1 \frac{1}{2} \times 6 = \frac{3}{2} \times 6 \]

\[ = \frac{18}{2} \]

\[ = 9 \]

So, \(1 \frac{1}{2} \times 6\) is the same as 6 groups of \(\frac{3}{2}\).

The group works on the project for a total of 9 hours.
Method 2

\[2\frac{1}{3} \times 5 = \frac{\text{Blocks}}{\text{Blocks}} \times 5\]

\[= \frac{33}{3} + \frac{\text{Blocks}}{\text{Blocks}}\]

\[= 11 + \frac{\text{Blocks}}{\text{Blocks}}\]

So, \(2\frac{1}{3} \times 5\) is the same as \(\frac{\text{Blocks}}{\text{Blocks}}\) groups of \(\frac{\text{Blocks}}{\text{Blocks}}\).
Let’s Explore!
The model shows $4\frac{1}{2}$.

1. Express this product as a product of another mixed number and a whole number.

$$4\frac{1}{2} = \frac{9}{2} \times 2$$
Use the same method to find the missing number below.

\[ a \quad 8 \frac{1}{4} = \square \times 2 \]

\[ b \quad 9 \frac{1}{2} = \square \times 3 \]
Multiply. Express each product as a whole number or a mixed number in simplest form.

3. \(3\frac{9}{11} \times 33\)

4. \(14 \times 2\frac{3}{5}\)

5. \(38 \times 5\frac{2}{7}\)
6. Name a whole number that you can multiply $4\frac{3}{4}$ by to get a product greater than $4\frac{3}{4}$. Name a mixed number that would give a similar result.
7 Name a number you can multiply \(3 \frac{5}{6}\) by to get a product less than \(3 \frac{5}{6}\).
Chapter 4 Lesson 4.4

Problem of the Lesson

Use models to help you find the product of 5 and $1\frac{3}{4}$. 