Module 3 - Lesson 10:

Multiply fractions greater than 1 by fractions.

CCSS Standard – 5.NF.B.5.a / 5.NF.B.5.b

FLUENCY (10-min) **Whiteboard Exchange: Write and Evaluate Expressions**

Write an expression to represent the statement.
Write the VALUE of the expression.

The sum of 3 and 7, doubled

The difference between 8 and 2, divided by 3

4 times as much as the sum of 3 and 5

FLUENCY (10-min) **Whiteboard Exchange: Subtract Fractions**

Raise your hand when you know the answer to each question.
Wait for my signal to say the answer.

$$\frac{1}{2} - \frac{1}{3} =$$

Look at the fractional units.
*Do they have **LIKE units**?*

*No! Are the units **RELATED**?*

*No! **RENAME both fractions** to make fractional units, or denominators, the same*

FLUENCY (10-min) **Whiteboard Exchange: Subtract Fractions**

Raise your hand when you know the answer to each question.
Wait for my signal to say the answer.

$$\frac{4}{5} - \frac{1}{2} =$$

Look at the fractional units.
*Do they have **LIKE units**?*

*No! Are the units **RELATED**?*

*No! **RENAME <u>both fractions</u>** to make fractional units, or denominators, the same*

FLUENCY (10-min) **Whiteboard Exchange: Subtract Fractions**

Raise your hand when you know the answer to each question.
Wait for my signal to say the answer.

$$\frac{2}{3} - \frac{2}{4} =$$

Look at the fractional units.
*Do they have **LIKE units**?*

*No! Are the units **RELATED**?*

*No! **RENAME both fractions** to make fractional units, or denominators, the same*

FLUENCY (10-min) **Whiteboard Exchange: Subtract Fractions**

Raise your hand when you know the answer to each question.
Wait for my signal to say the answer.

$$\frac{5}{4} - \frac{1}{6} =$$

Look at the fractional units.
*Do they have **LIKE units**?*

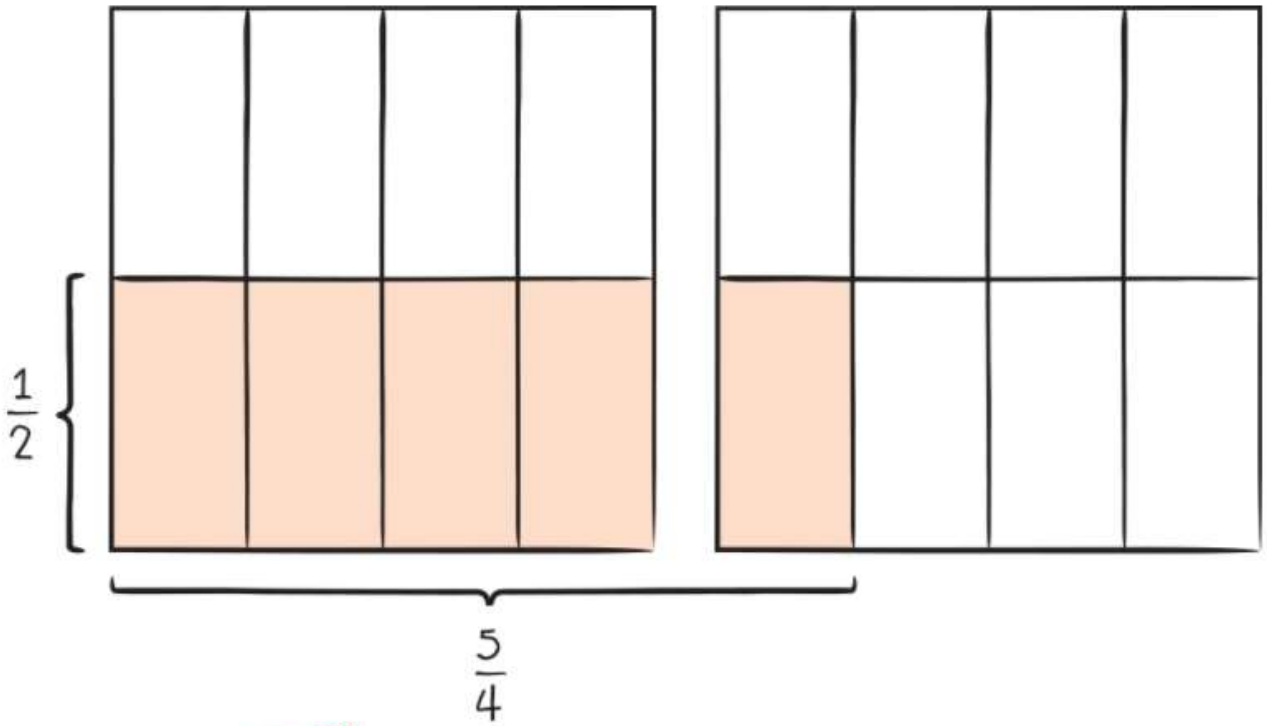
*No! Are the units **RELATED**?*

*No! **RENAME both fractions** to make fractional units, or denominators, the same*

LAUNCH (5-min)

Analyze a model involving a fraction GREATER THAN 1 and identify an error in the interpretation of the model.

Look at the area model below.
Does it accurately represent 1/2 x 5/4?



What do you notice? Wonder?

Why do you think the person who made this model used <u>two squares</u> to find the product?

The model shows that 1/2 x 5/4 = 5/16.
Do you agree? Why or why not?

The model shows 16 parts. It should show 8 parts.
1 shaded part is 1/8 and the answer should be 5/8.

LEARN (35-min) **Multiply a Fraction Greater Than 1 by a Unit Fraction**

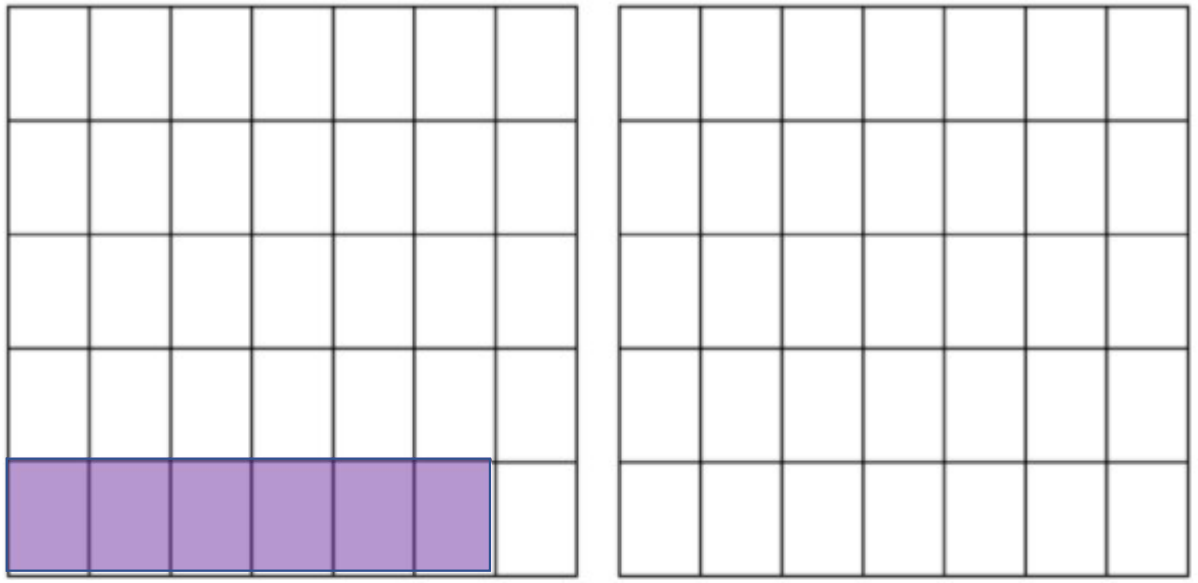
Place page 87 of your LEARN book into your protective sleeve.

We are going to use the area models to answer the questions on page 89.

$$\frac{1}{5} \times \frac{6}{7} = \frac{6}{35}$$

In this problem, is there a fraction greater than one?

No. So, our answer will be represented on ONE square.



ATTENTION PLEASE

Each model is partitioned into sevenths **VERTICALLY** and into fifths **HORIZONTALLY.**

We will need BOTH squares for any problem that has a value **GREATER THAN ONE.**

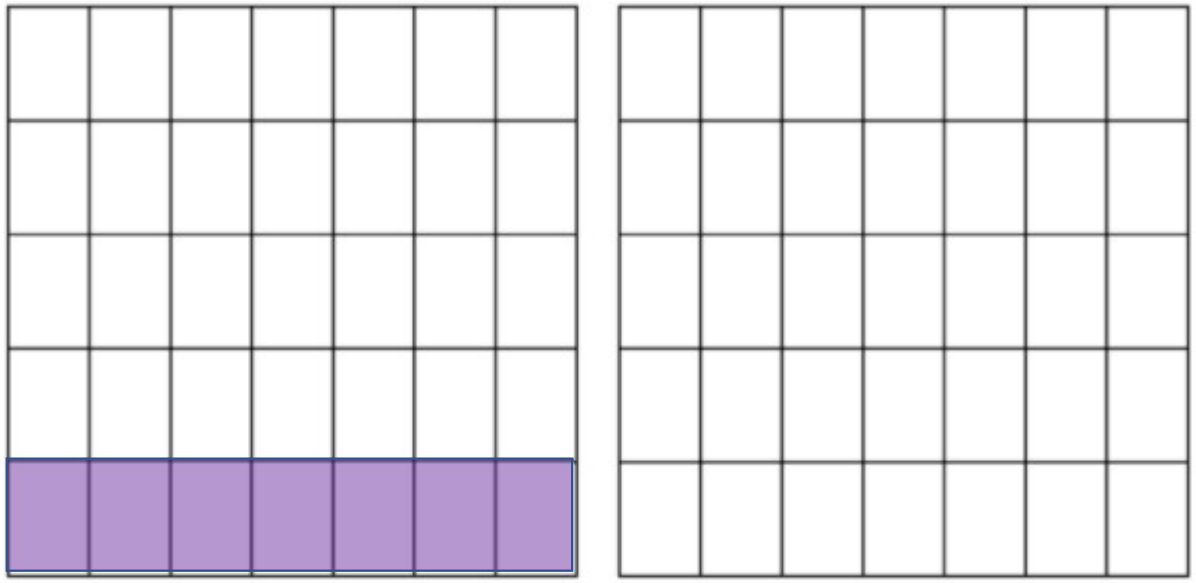
LEARN (35-min) **Multiply a Fraction Greater Than 1 by a Unit Fraction**

Page 89 of your LEARN book.

$$\frac{1}{5} \times \frac{7}{7} = \frac{7}{35}$$

In this problem, is there a fraction greater than one?

No. So, our answer will be represented on ONE square.



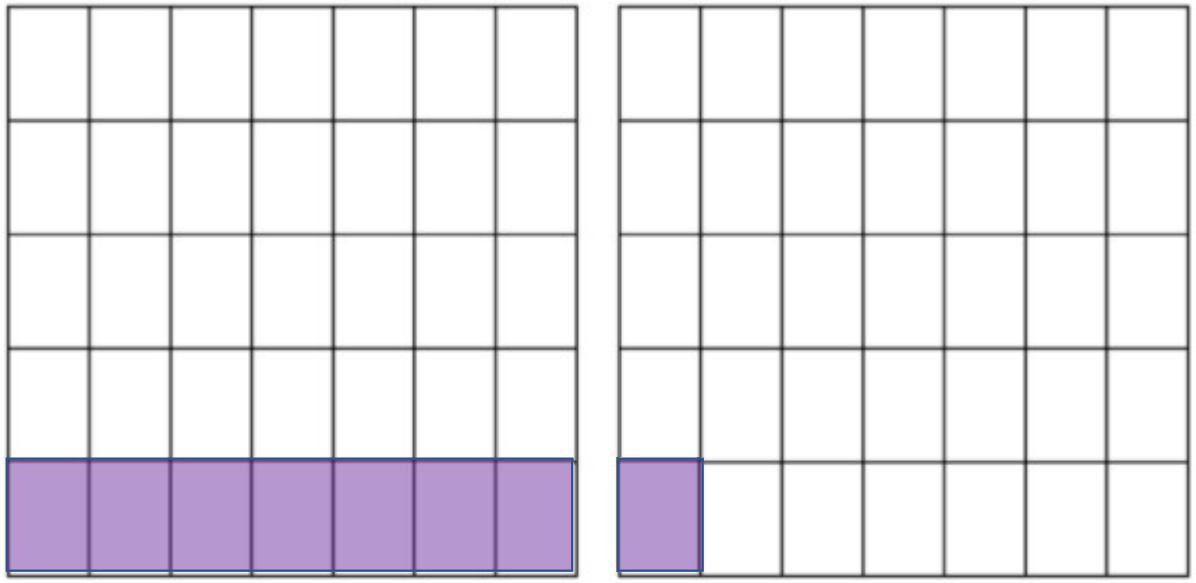
LEARN (35-min) **Multiply a Fraction Greater Than 1 by a Unit Fraction**

Page 89 of your LEARN book.

$$\frac{1}{5} \times \frac{8}{7} = \frac{8}{35}$$

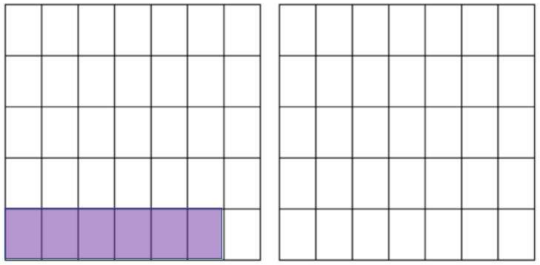
In this problem, is there a fraction greater than one?

Yes! So, our answer will be represented on TWO squares.



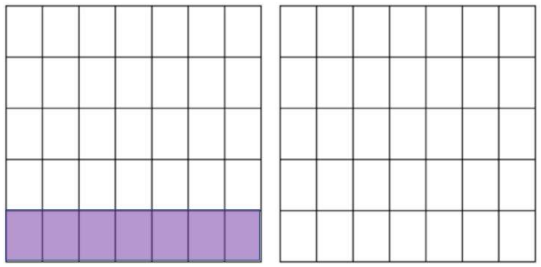
Multiplying a Fraction Greater Than 1 by a Unit Fraction

$$\frac{1}{5} \times \frac{6}{7} = \frac{6}{35}$$



In this problem, we multiplied a fraction by another fraction **LESS THAN ONE**. The product 6/35 was **LESS THAN both the factors** 1/5 and 6/7. This is reasonable because both factors are less than one and the product is less than one.

$$\frac{1}{5} \times \frac{7}{7} = \frac{7}{35}$$



In this problem, we multiplied a fraction by another fraction **EQUAL TO ONE**. The product 7/35 is LESS THAN ONE but **EQUAL TO the factor 1/5**.

$$\frac{1}{5} \times \frac{8}{7} = \frac{8}{35}$$

In this problem, we multiplied a fraction by another fraction **GREATER THAN ONE**. The product 8/35 is LESS THAN ONE but **GREATER THAN the factor 1/5**.

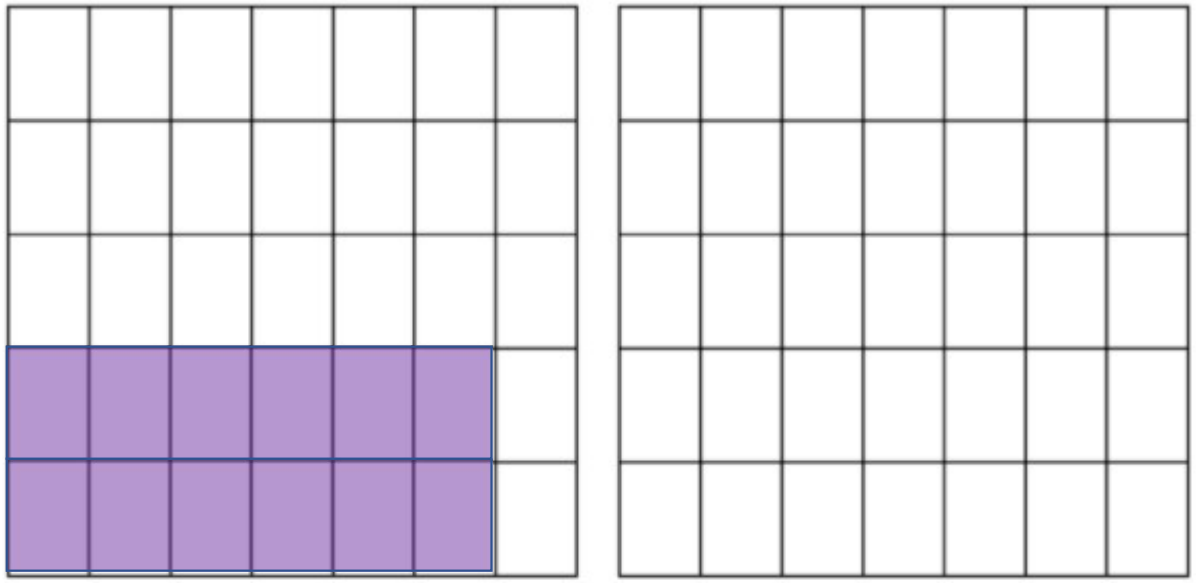
LEARN (35-min) **Multiply a Fraction Greater Than 1 by a Unit Fraction**

Page 89 of your LEARN book.

$$\frac{2}{5} \times \frac{6}{7} = \frac{12}{35}$$

In this problem, is there a fraction greater than one?

No. So, our answer will be represented on ONE square.



In this problem, we multiplied a fraction by another fraction **LESS THAN ONE**. The product 12/35 was **LESS THAN both the factors** 1/5 and 6/7. This is reasonable because both factors are less than one and the product is less than one.

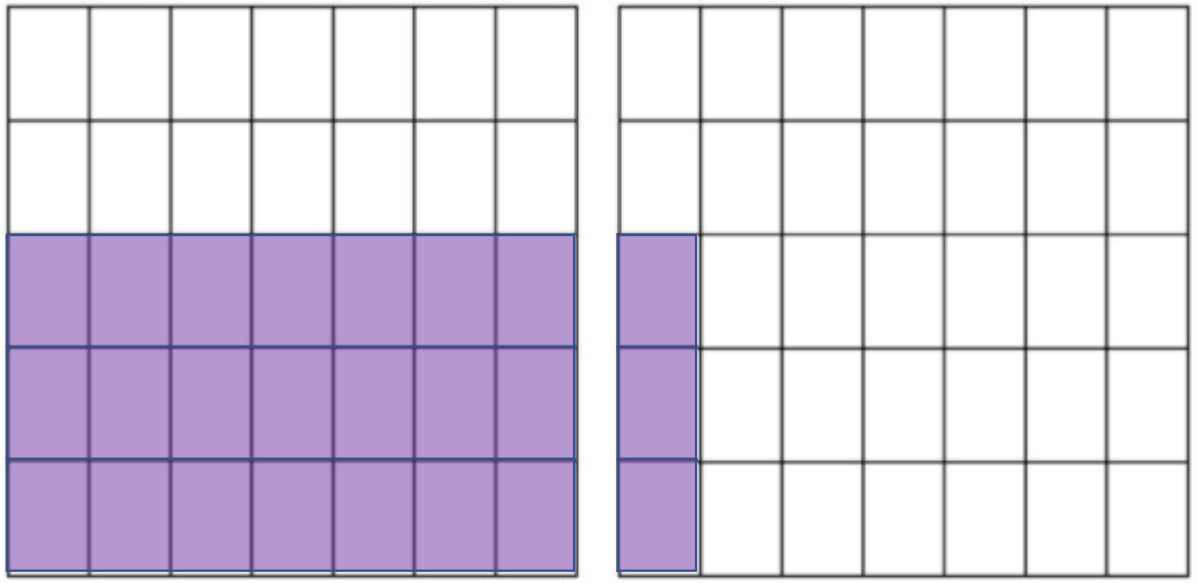
LEARN (35-min) **Multiply a Fraction Greater Than 1 by a Unit Fraction**

Page 89 of your LEARN book.

$$\frac{3}{5} \times \frac{8}{7} = \frac{24}{35}$$

In this problem, is there a fraction greater than one?

Yes! So, our answer will be represented on TWO squares.



In this problem, we multiplied a fraction by another fraction **GREATER THAN ONE**. The product 24/35 was **LESS THAN ONE**. This is reasonable because one factor is less than one and the product is less than one.

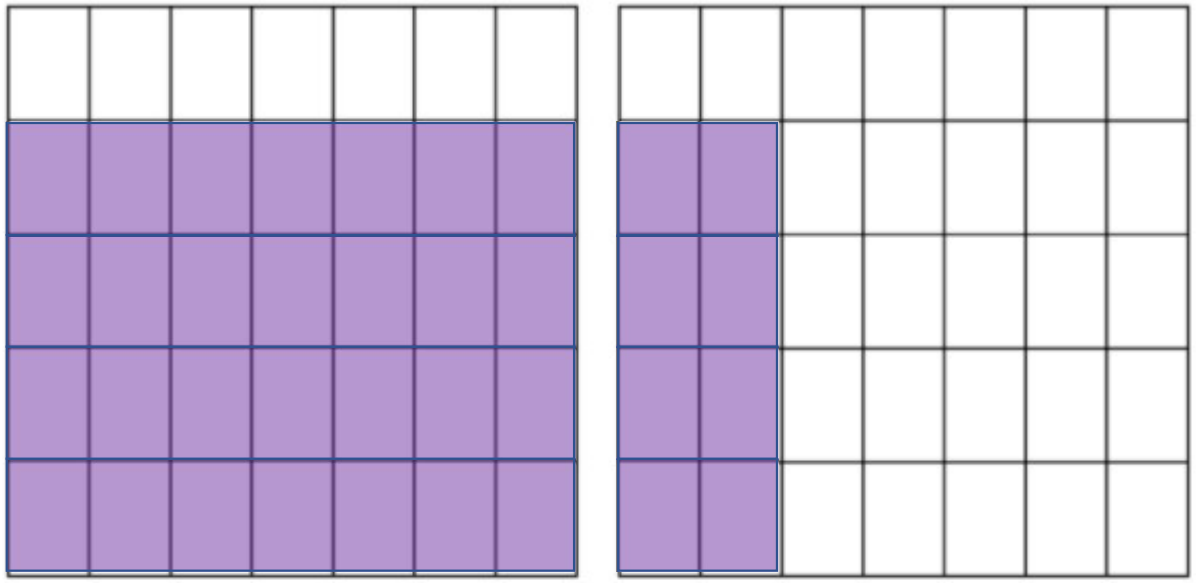
LEARN (35-min) **Multiply a Fraction Greater Than 1 by a Unit Fraction**

Page 89 of your LEARN book.

$$\frac{4}{5} \times \frac{9}{7} = \frac{36}{35}$$

In this problem, is there a fraction greater than one?

Yes! So, our answer will be represented on TWO squares.



In this problem, we multiplied a fraction by another fraction **GREATER THAN ONE**. The product 36/35 was **GREATER THAN ONE**. This is reasonable because one factor is greater than one and the product is greater than one.

LEARN (35-min) **Multiply a Fraction Greater Than 1 by a Unit Fraction**

Page 89 of your LEARN book.

The take-away of this lesson, sometimes the product of a fraction and a fraction GREATER THAN 1 is less than one and sometimes it is greater than one. It depends on the size of the factors. If a factor is almost 2, the product may be greater than one.

3. Multiply. Show your thinking.

a. $\frac{3}{4} \times \frac{6}{5} =$ $\frac{18}{20}$ or $\frac{9}{10}$

b. $\frac{9}{10} \times \frac{5}{4} =$ $\frac{45}{40}$ or $1\frac{5}{40}$

c. $\frac{2}{11} \times \frac{13}{5} =$ $\frac{26}{55}$

d. $\frac{10}{13} \times \frac{4}{3} =$ $\frac{40}{39}$ or $1\frac{6}{39}$

LAND (10-min)

Exit Ticket

Exit Ticket – PAGE 97

Small Group Time:
Problem Set Pages 91-93

Homework:
Page 63 APPLY BOOK

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Make a simpler problem. Then multiply.

1. $\frac{9}{2} \times \frac{2}{10} =$ _____

2. $\frac{4}{9} \times \frac{6}{6} =$ _____

3. $\frac{9}{10} \times \frac{5}{3} =$ _____

4. $\frac{7}{6} \times \frac{8}{9} =$ _____