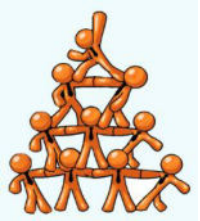
# 4-11: Learning Goals

- Let’s divide fractions using the rule we learned.

# 4-11-1: Multiplying Fractions

Evaluate each expression.

1. $\frac{2}{3} \cdot 27$
2. $\frac{1}{2} \cdot \frac{2}{3}$
3. $\frac{2}{9} \cdot \frac{3}{5}$
4. $\frac{27}{100} \cdot \frac{200}{9}$
5. $\left(1\frac{3}{4}\right) \cdot \frac{5}{7}$



# 4-11-2: Dividing a Fraction by a Fraction

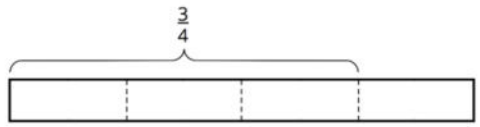
Work with a partner. One person should work on the questions labeled "Partner A," and the other should work on those labeled "Partner B."

1. Partner A.

   Find the value of each expression, and answer the question by completing the diagram that has been started for you. Show your reasoning.

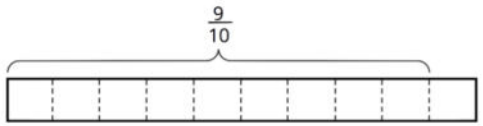
   a. $\frac{3}{4} \div \frac{1}{8}$

   How many $\frac{1}{8}$s in $\frac{3}{4}$?




   b. $\frac{9}{10} \div \frac{3}{5}$

   How many $\frac{3}{5}$s in $\frac{9}{10}$?




2. Partner B.

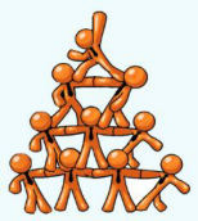
   Elena said: "If you want to divide 4 by $\frac{2}{5}$, you can multiply 4 by 5, then divide it by 2 or multiply it by $\frac{1}{2}$."

   Find the value of each expression using the strategy that Elena described.

   a. $\frac{3}{4} \div \frac{1}{8}$

   b. $\frac{9}{10} \div \frac{3}{5}$

   Pause here for a discussion with your partner.



# 4-11-2: Dividing a Fraction by a Fraction

3. Complete this statement based on your observations:

   To divide a number $n$ by a fraction $\frac{a}{b}$, we can multiply $n$ by _____ and then divide the product by _____.

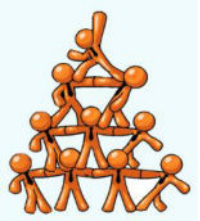
4. Select **all** equations that represent the statement you completed.

   a. $n \div \frac{a}{b} = n \cdot b \div a$

   b. $n \div \frac{a}{b} = n \cdot a \div b$

   c. $n \div \frac{a}{b} = n \cdot \frac{a}{b}$

   d. $n \div \frac{a}{b} = n \cdot \frac{b}{a}$



# 4-11-3: Using an Algorithm to Divide Fractions

1. Calculate each quotient using your preferred strategy. Show your work and be prepared to explain your strategy.

   a. $\frac{8}{9} \div 4$

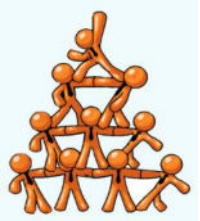
   b. $\frac{3}{4} \div \frac{1}{2}$

   c. $3\frac{1}{3} \div \frac{2}{9}$

   d. $\frac{9}{2} \div \frac{3}{8}$

   e. $6\frac{2}{5} \div 3$

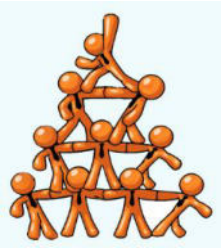
2. After biking $5\frac{1}{2}$ miles, Jada has traveled $\frac{2}{3}$ of the length of her trip. How long (in miles) is the entire length of her trip? Write an equation to represent the situation, and find the answer using your preferred strategy.



# 4-11: Lesson Synthesis

"Suppose we interpret $\frac{3}{2} \div \frac{2}{5}$ to mean 'how many $\frac{2}{5}$ are in $\frac{3}{2}$?' and use a tape diagram to find the answer. Where do we see the multiplication by 5 and by $\frac{1}{2}$ in the diagramming process?"

"Suppose we interpret $\frac{3}{2} \div \frac{2}{5}$ to mean '$\frac{2}{5}$ of what number is $\frac{3}{2}$?' and use a tape diagram to find the answer. Where do we see the multiplication by 5 and by $\frac{1}{2}$ in the diagramming process?"



# 4-11: Learning Targets

- I can describe and apply a rule to divide numbers by any fraction.

# 4-11-4: Watering a Fraction of House Plants

1. Find the value of $\frac{24}{25} \div \frac{4}{5}$. Show your reasoning.

2. If $\frac{4}{3}$ liters of water are enough to water $\frac{2}{5}$ of the plants in the house, how much water is necessary to water all the plants in the house? Write a multiplication equation and a division equation for the situation, then answer the question. Show your reasoning.