

AIM: 5-7 I will be able to multiply fractions and mixed numbers!

Name _____
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Date _____
Math 6

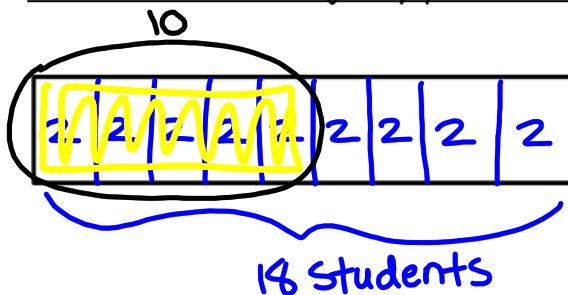
Warm-up:

Your teacher asks your class of 18 students who owns a pet. $\frac{5}{9}$ of the students have pets. How many students have pets?

$$\frac{5}{9} \text{ of } 18$$
$$\frac{5}{9} \cdot 18$$

① $5 \cdot 18 = 90$
② $90 \div 9 = 10$

Draw an area model to justify your answer!



Ten students have pets.

$$18 \div 9 = 2$$



Let's Investigate: Multiplying fractions and mixed numbers.

To find a fraction **of** an amount, you **multiply!**

Multiplication Algorithm: $\frac{a}{b} \cdot \frac{c}{d} = \frac{ac}{bd}$

multiply across

Key Concept 1:

To multiply proper fractions, multiply straight across!

a) $\frac{5}{7} \cdot \frac{2}{3} = \frac{5 \cdot 2}{7 \cdot 3} = \frac{10}{21}$

b) $\frac{8}{13} \cdot \frac{2}{5} = \frac{8 \cdot 2}{13 \cdot 5} = \frac{16}{65}$

Key Concept 2: Cross-Cancelling (or reducing)

Cross cancelling is a way to simplify before we multiply. This can save us from working with large numbers in our product.

Cross-cancel when there are **common factors** in the numerator & denominator.

Example:

$$\frac{14 \div 2}{20 \div 2} \cdot \frac{40 \div 8}{16 \div 8}$$
$$\frac{7}{2} \cdot \frac{5}{2}$$
$$\frac{7}{2} \cdot \frac{1}{2} = \frac{7 \cdot 1}{2 \cdot 2} = \frac{7}{4} = \left(1 \frac{3}{4}\right)$$

Let's Practice how to CROSS-CANCEL!

a) $\frac{1 \cancel{2}}{1 \cancel{3}} \cdot \frac{9 \cancel{3}}{12 \cancel{6}}$ $\frac{1 \cdot 3}{1 \cdot 6} = \frac{3 \div 3}{6 \div 3} = \left(\frac{1}{2}\right)$	b) $\frac{5}{2 \cancel{8}} \cdot \frac{\cancel{4} 1}{3}$ $\frac{5 \cdot 1}{2 \cdot 3} = \left(\frac{5}{6}\right)$
c) $\frac{9 \cancel{45}}{1} \cdot \frac{4}{\cancel{5} 1}$ $\frac{9}{1} \cdot \frac{4}{1} = \frac{36}{1} = \left(36\right)$	d) $\frac{8 \cancel{16}}{7 \cancel{21}} \cdot \frac{\cancel{6} 2}{14 \cancel{7}}$ $\frac{8 \cdot 2}{7 \cdot 7} = \left(\frac{16}{49}\right)$

Key Concept 3:

To multiply *mixed numbers*, convert to improper fractions then multiply across. *Cross-cancel if possible*

e) $2\frac{3}{4} \cdot 3\frac{1}{5}$

$\downarrow \quad \downarrow$

$1\frac{11}{4} \cdot \frac{16}{5} \rightarrow \frac{11 \cdot 4}{1 \cdot 5} = \frac{44}{5} = 8\frac{4}{5}$

f) $1\frac{1}{3} \cdot 1\frac{5}{7}$

$\downarrow \quad \downarrow$

$1\frac{4}{3} \cdot \frac{12}{7} \rightarrow \frac{4 \cdot 4}{1 \cdot 7} = \frac{16}{7} = 2\frac{2}{7}$



Summarize: How are adding and subtracting two fractions and multiplying two fractions similar and different?

Similarities:

answer must be in simplest form

Differences:

(x): no common denominator
(+/-): need a common deno.