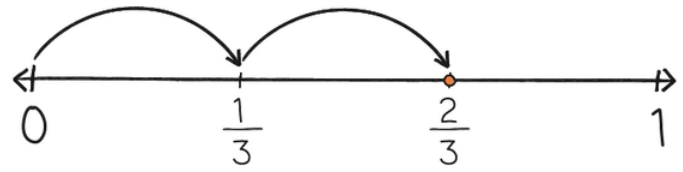
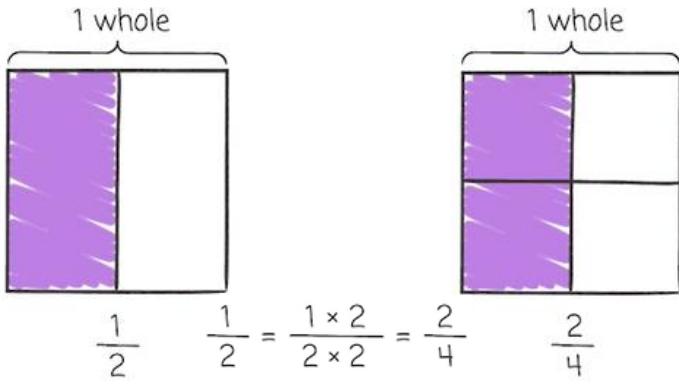


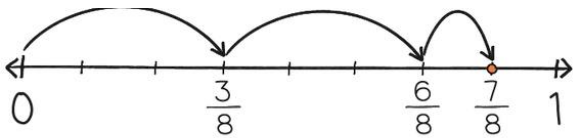
# 5th Grade Mission 3 Notes

equivalent- equal



equal fractional parts  $\frac{1}{3} + \frac{1}{3} = \frac{2}{3}$

$(2 \times \frac{1}{3}) = \frac{2}{3}$

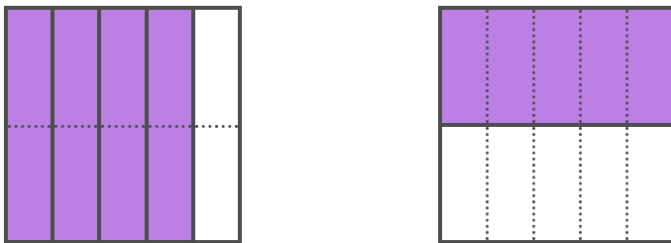
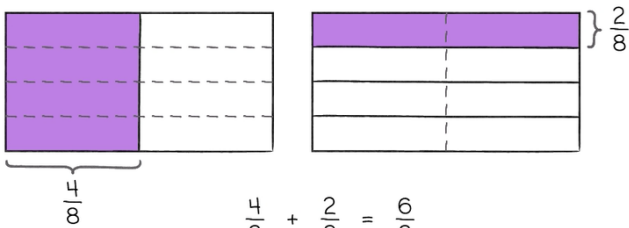


$\frac{3}{8} + \frac{3}{8} + \frac{1}{8} = \frac{7}{8}$

$(2 \times \frac{3}{8}) + \frac{1}{8} = \frac{7}{8}$

You can't add or subtract unlike units.  
You must convert them to common factors.

$\frac{1}{2} + \frac{1}{4}$



$\frac{4}{5} + \frac{1}{2} = \frac{8}{10} + \frac{5}{10} = \frac{13}{10} = 1 \frac{3}{10}$

## Adding Fractions With UNLIKE denominators

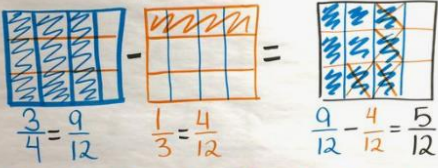
- Draw 2 rectangles  $\frac{1}{2} + \frac{1}{4}$
- Break into parts to model.
  - partition 1st box vertically
  - partition 2nd box horizontally
- Create like units
  - divide 1st box horizontally into same units as 2nd box
  - partition 2nd box vertically like 1st box
- Count shaded units

BONUS: Simplify as  $\frac{3}{4}$

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

## Subtract Fractions with Unlike Denominators

$$\frac{3}{4} - \frac{1}{3}$$

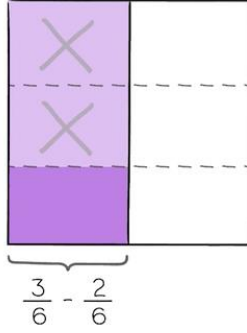


$$\frac{3}{4} = \frac{9}{12} \quad \frac{1}{3} = \frac{4}{12} \quad \frac{9}{12} - \frac{4}{12} = \frac{5}{12}$$

$$\frac{3}{4} \times \frac{3}{3} = \frac{9}{12} \quad \frac{1}{3} \times \frac{4}{4} = \frac{4}{12} \quad \frac{9}{12} - \frac{4}{12} = \frac{5}{12}$$

- Find a common denominator
- Change fractions so they have the same denominator
- Subtract the numerators

$$\frac{1}{2} - \frac{1}{3} = \frac{3}{6} - \frac{2}{6} = \frac{1}{6}$$



$$\frac{3}{6} - \frac{2}{6}$$

## Adding and Subtracting Fractions with Unlike Denominators

$$\frac{1}{2} + \frac{2}{3}$$

1. Find a common denominator
  - Ⓐ multiply the denominators OR
  - Ⓑ list the multiples
2. Write equivalent fractions w/ the common denominator
  - $\frac{1}{2} \times \frac{3}{3} = \frac{3}{6}$
  - $\frac{2}{3} \times \frac{2}{2} = \frac{4}{6}$
3. Write the problem w/ equivalent fractions
  - $\frac{1}{2} + \frac{2}{3} \rightarrow \frac{3}{6} + \frac{4}{6}$
4. Find the sum.
  - Add the numerators; denominator stays the same
  - $\frac{3}{6} + \frac{4}{6} = \frac{7}{6}$
  - $\frac{1}{2} + \frac{2}{3} = \frac{7}{6}$  or  $1\frac{1}{6}$
  - ↑ improper fraction
5. Simplify, when needed

## Adding & Subtracting Mixed Numbers

Strategy #2:

$$3\frac{4}{5} - 1\frac{1}{2} =$$

Step 1: Subtract whole #'s

$$3 - 1 = 2$$

Step 2: Subtract fractions by finding a common denominator

$$\frac{2 \times 4}{2 \times 5} \times \frac{1 \times 5}{2 \times 5} = \frac{8}{10} - \frac{5}{10} = \frac{3}{10}$$

Step #3: Write mixed # using whole # from step 1 and fraction from step 2.

$$2\frac{3}{10}$$

$$\frac{1}{2} + \frac{1}{5}$$

$$= \left(\frac{1 \times 5}{2 \times 5}\right) + \left(\frac{1 \times 2}{5 \times 2}\right) = \left(\frac{1 \times 10}{2 \times 10}\right) + \left(\frac{1 \times 4}{5 \times 4}\right)$$

$$= \frac{5}{10} + \frac{2}{10}$$

$$= \frac{7}{10}$$

$$\frac{1}{2} + \frac{1}{5}$$

$$= \left(\frac{1 \times 10}{2 \times 10}\right) + \left(\frac{1 \times 4}{5 \times 4}\right)$$

$$= \frac{10}{20} + \frac{4}{20}$$

$$= \frac{14}{20}$$

$$2\frac{4}{5} + 1\frac{1}{2}$$

$$= 3 + \left(\frac{4}{5} + \frac{1}{2}\right)$$

$$= 3 + \left(\frac{4}{5} \times \frac{2}{2}\right) + \left(\frac{1}{2} \times \frac{5}{5}\right)$$

$$= 3 + \frac{8}{10} + \frac{5}{10}$$

$$= 4\frac{3}{10}$$

$$5\frac{3}{4} - 3\frac{1}{6}$$

$$= 2\frac{3}{4} - \frac{1}{6}$$

$$= 2\frac{9}{12} - \frac{2}{12}$$

$$= 2\frac{7}{12}$$

$$1 + 1\frac{3}{4}$$

$$= 1 + 1 + \frac{3}{4}$$

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

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

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

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

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

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

$$= (3\frac{1}{4} - 2) - \frac{1}{2}$$

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

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

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

$\frac{1}{2}$	$\frac{3}{4}$
\$0.50	\$0.75

Rearrange the fractions to add the like units first.

$$\frac{2}{3} + \frac{1}{5} + \frac{1}{3} + 1\frac{4}{5}$$

$$= (\frac{2}{3} + \frac{1}{3}) + (\frac{1}{5} + 1\frac{4}{5})$$

$$= 1 + 2$$

$$= 3$$

$$5\frac{7}{8} - \frac{1}{2} - \frac{7}{8} - 1\frac{1}{2}$$

$$= (5\frac{7}{8} - \frac{7}{8}) - (\frac{1}{2} + 1\frac{1}{2})$$

Add to make a larger part to subtract from the whole.

$$= 5 - 2$$

$$= 3$$

$$3\frac{1}{4} - \frac{2}{5} + \frac{3}{4}$$

$$= (3\frac{1}{4} + \frac{3}{4}) - \frac{2}{5}$$

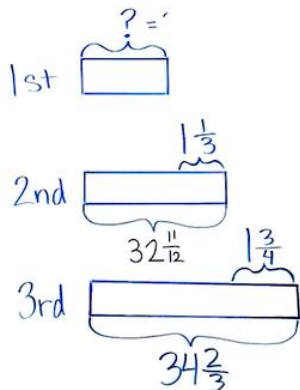
$$= 4 - \frac{2}{5}$$

$$= 3\frac{3}{5}$$

Convert 4 into fifths. You get 20 fifths. Then subtract 20 fifths - 2 fifths. You get 18 fifths. Take 18 fifths and make it into a mixed number.

In a race, the second-place finisher crossed the finish line  $1\frac{1}{3}$  minutes after the first-place finisher. The third-place finisher was  $1\frac{3}{4}$  minutes behind the second-place finisher. The third-place finisher took  $34\frac{2}{3}$  minutes.

How long did the first-place finisher take?



$$34\frac{2}{3} - 1\frac{3}{4} - 1\frac{1}{3} = ?$$

$$34\frac{8}{12} - 1\frac{9}{12} - 1\frac{4}{12}$$

$$33\frac{20}{12} - 1\frac{9}{12} - 1\frac{4}{12}$$

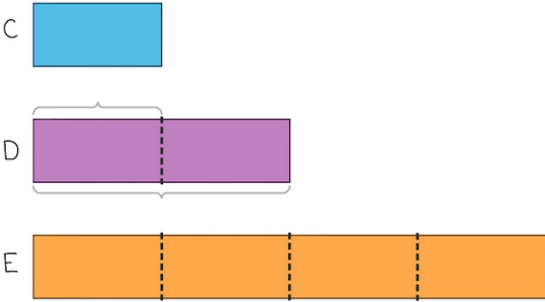
$$32\frac{11}{12} - 1\frac{4}{12}$$

$$32\frac{11}{12} - 1\frac{4}{12} = 31\frac{7}{12}$$

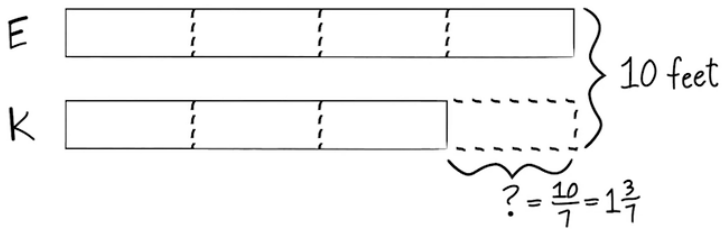
There were not enough units to subtract 8 twelfths - 9 twelfths, so they took away one whole and added it to the 8 twelfths.

The first-place finisher took  $31\frac{7}{12}$  minutes.

C is half the length of D. E is twice as long as D.



Half of Ethan's string is equal to  $\frac{2}{3}$  of Kayla's string. The total length of their strings is 10 feet. How much longer is Ethan's string than Kayla's?



$$7 \text{ units} = 10 \text{ feet}$$

$$1 \text{ unit} = \frac{10}{7}$$

Ethan's string is  $\frac{10}{7}$  feet, or  $1\frac{3}{7}$  feet, longer than Kayla's.

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