HOW TO ADD FRACTIONS
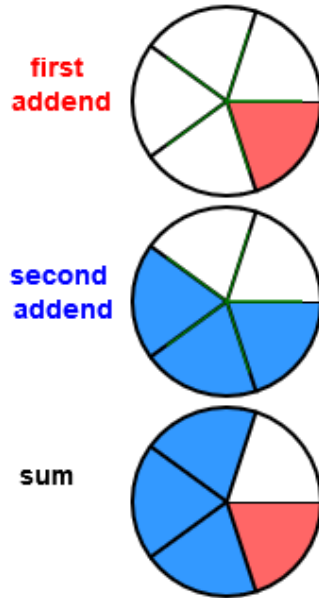
Introducing:

•first addend
•second addend
•sum

first addend

second addend

sum

$$\frac{1}{5} + \frac{3}{5} = \quad = \frac{4}{5}$$

first addend   second addend   Simplify

Add Fractions 1
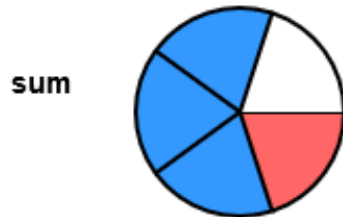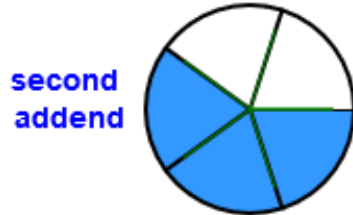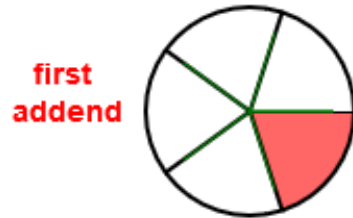
$$\frac{1}{5} + \frac{3}{5} = \qquad = \frac{4}{5}$$

first addend   **second addend**   Simplify

This picture shows an addition example with two *addends* and a *sum*. The *first addend* $^1/_5$ is combined with the *second addend* $^3/_5$ to give the *sum* $^4/_5$. Notice how the *sum* $^4/_5$ combines the 1 red fifth with the 3 blue fifths.

Add Fractions 2
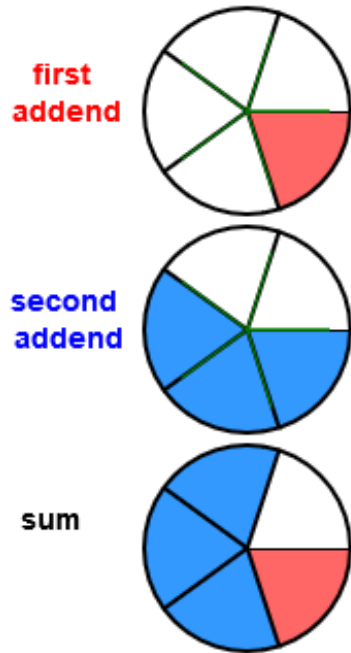
first
addend

second
addend

sum

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

first addend   second addend   Add numerators.   Simplify

$^1/_5$ and $^3/_5$ are like fractions because the denominators are the same. When the *addend* denominators are the same, add the numerators to get the numerator of the *sum*.

Add Fractions 3
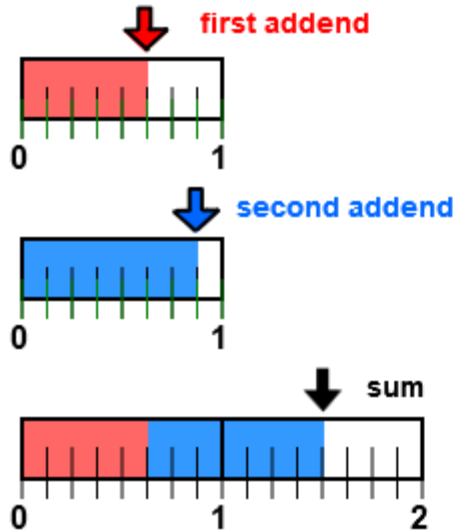
$$\frac{5}{8} \quad + \quad \frac{7}{8} \quad = \quad \frac{(5+7)}{8} \quad = \quad \frac{12}{8} \quad = \quad 1\frac{1}{2}$$

first addend   second addend   Add numerators.   Simplify

The *sum* $\frac{12}{8}$ is written as a mixed number in lowest terms. The numerals $\frac{12}{8}$ and $1\frac{1}{2}$ are correct names for the *sum* of $\frac{5}{8}$ and $\frac{7}{8}$.

Add Fractions 4

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

first addend   second addend   Add whole numbers and numerators.   Simplify
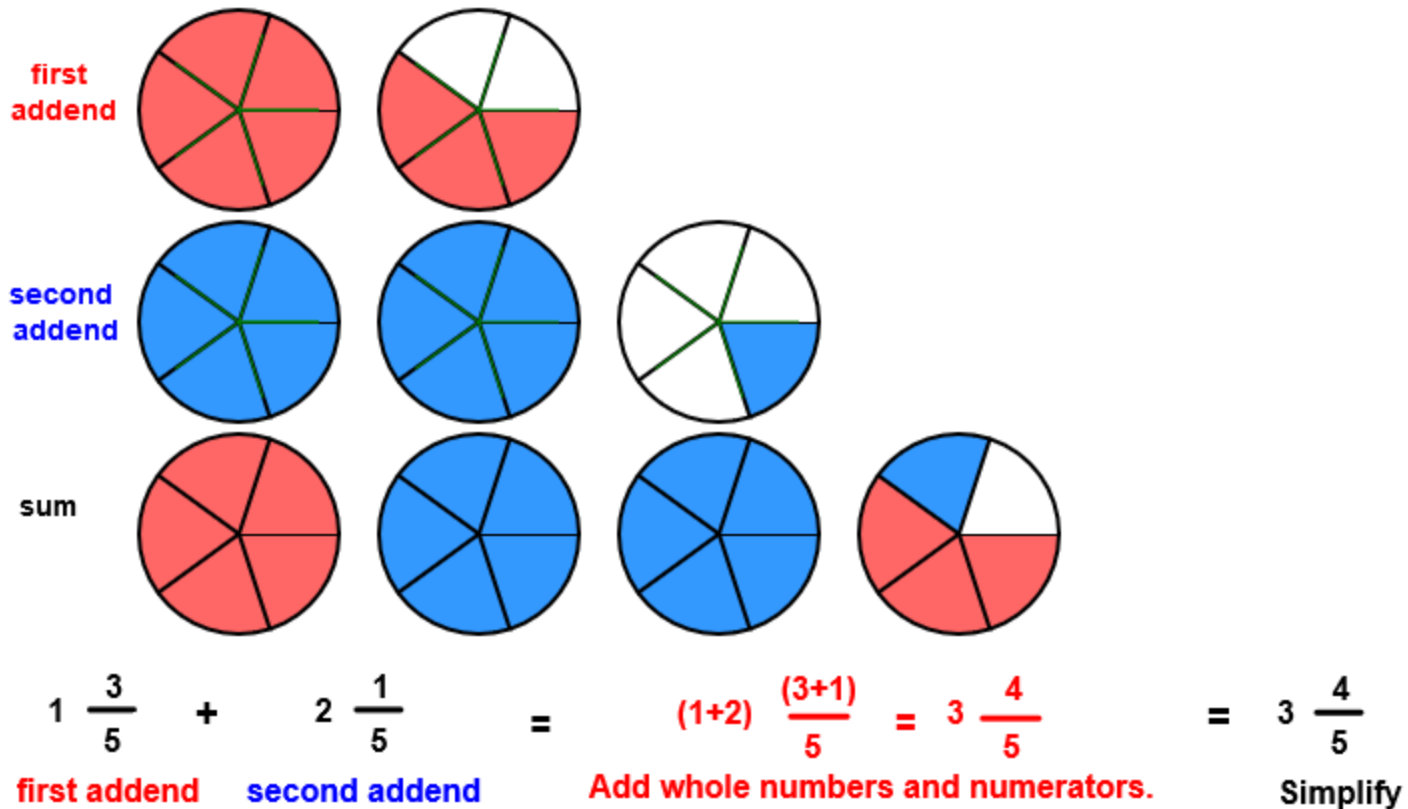
Here, mixed numbers are added. The whole number 1 in 1 $\frac{3}{5}$ is added to the whole number 2 in 2 $\frac{1}{5}$ for a whole number 3 in the *sum*. The fractions $\frac{3}{5}$ and $\frac{1}{5}$ are added for the $\frac{4}{5}$ in the *sum*.
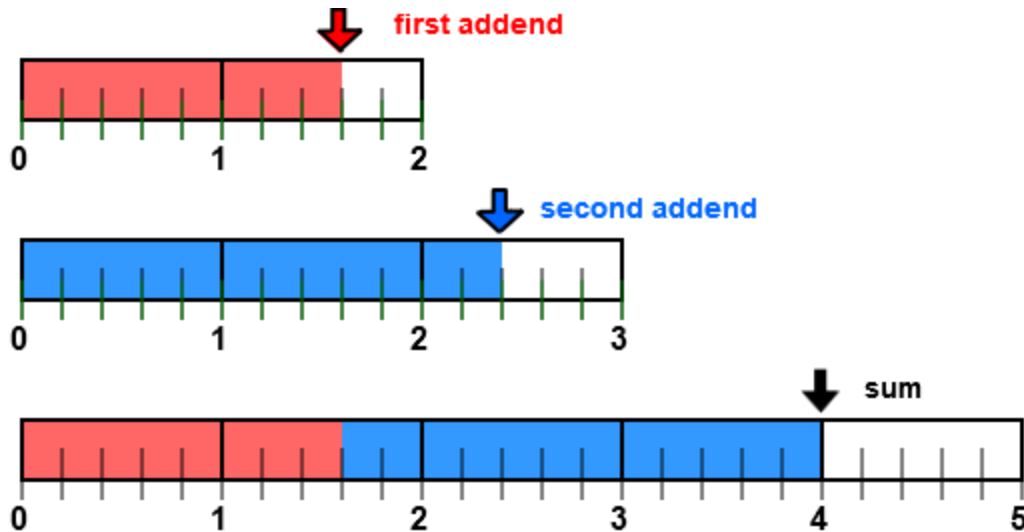
Add Fractions 5
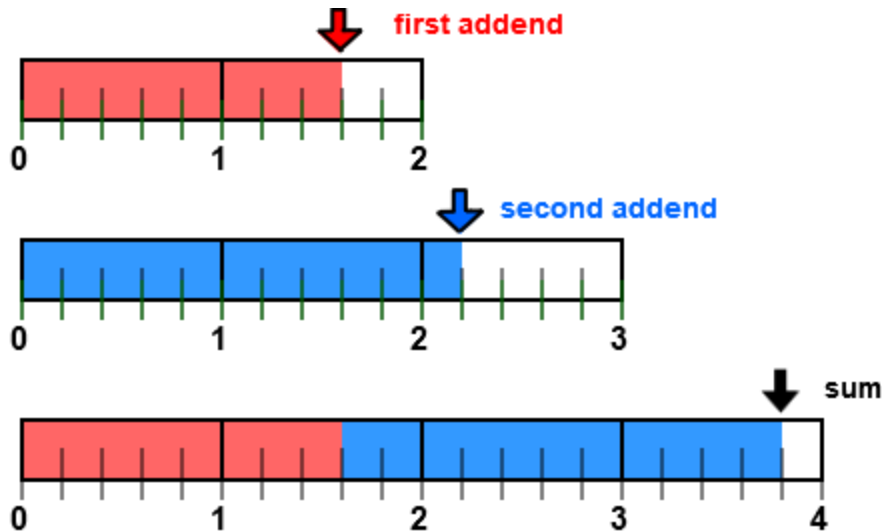
$$1\ \frac{3}{5} \quad + \quad 2\ \frac{1}{5} \quad = \quad (1+2)\ \frac{(3+1)}{5} = 3\ \frac{4}{5} \quad = \quad 3\ \frac{4}{5}$$

first addend   second addend   Add whole numbers and numerators.   Simplify

The same example $1\ \frac{3}{5}$ plus $2\ \frac{1}{5}$ is shown with number lines. Add the whole numbers and then the fractions:

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

Add Fractions 6

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

first addend   second addend   Add whole numbers and numerators.   Simplify

This example shows the *sum* 3 $\frac{5}{5}$ written as 4. Since the fraction $\frac{5}{5}$ is equal to 1, 3 $\frac{5}{5}$ is equal to 3 + 1 for a *sum* of 4

Add Fractions 7
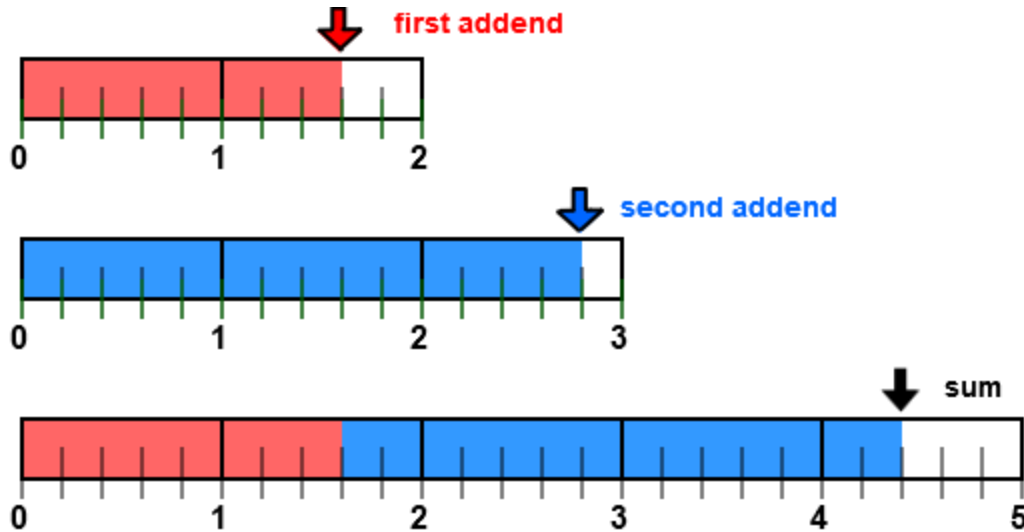
$$1 \frac{3}{5} \quad + \quad 2 \frac{4}{5} \quad = \quad (1+2) \frac{(3+4)}{5} \quad = \quad 3 \frac{7}{5} \quad = \quad 4 \frac{2}{5}$$

first addend   second addend   Add whole numbers and numerators.   Simplify

This example shows the *sum* 3 $^7/_5$ written as 4 $^2/_5$. The $^7/_5$ part of the *sum* can be renamed as 1 $^2/_5$. The 1 in 1 $^2/_5$ is added to the whole number 3 for the 4 in 4 $^2/_5$:   1 $^3/_5$ + 2 $^4/_5$ = 3 $^7/_5$ = 3 + 1 $^2/_5$ = 4 $^2/_5$.

Add Fractions 8

first addend

second addend

sum
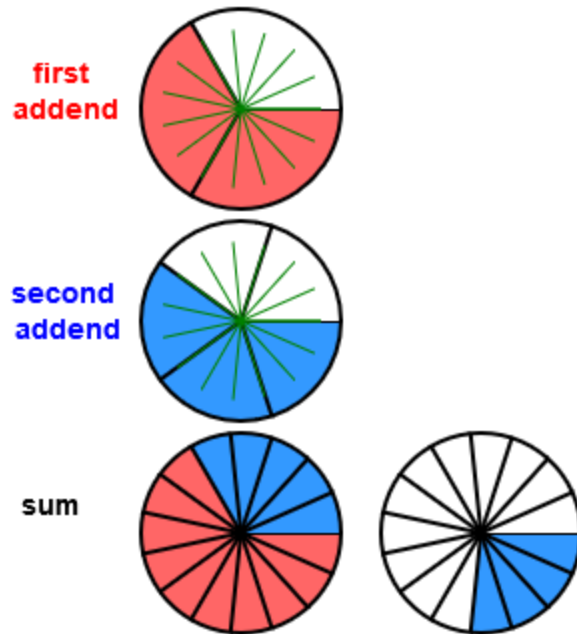
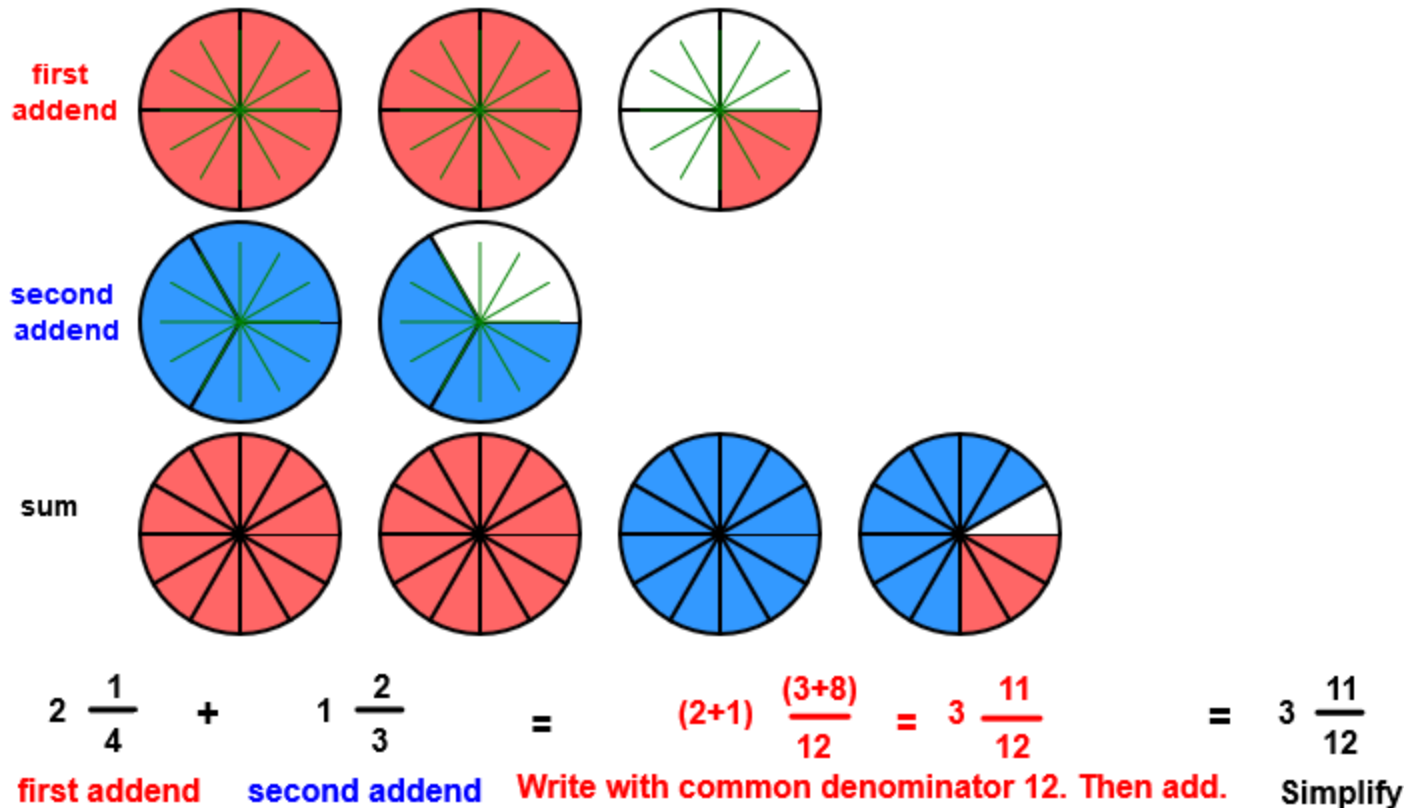$$\frac{2}{3} \; + \; \frac{3}{5} \; = \; \frac{(10+9)}{15} = \frac{19}{15} \; = \; 1\frac{4}{15}$$

first addend   second addend   Write with common denominator 15. Then add.   Simplify

The *addends* $\frac{2}{3}$ and $\frac{3}{5}$ are unlike fractions. Each addend is written with the common denominator 15, giving $\frac{10}{15}$ and $\frac{9}{15}$. Then add the numerators for a *sum* of $\frac{19}{15}$ or $1\frac{4}{15}$.

Add Fractions 9

$$2\frac{1}{4} \quad + \quad 1\frac{2}{3} \quad = \quad (2+1)\frac{(3+8)}{12} \quad = \quad 3\frac{11}{12} \quad = \quad 3\frac{11}{12}$$

first addend   second addend   Write with common denominator 12. Then add.   Simplify

The unlike fractions $2\frac{1}{4}$ and $1\frac{2}{3}$ are renamed as like fractions $2\frac{3}{12}$ and $1\frac{8}{12}$. Then the whole numbers and numerators are added for a *sum* of $3\frac{11}{12}$.
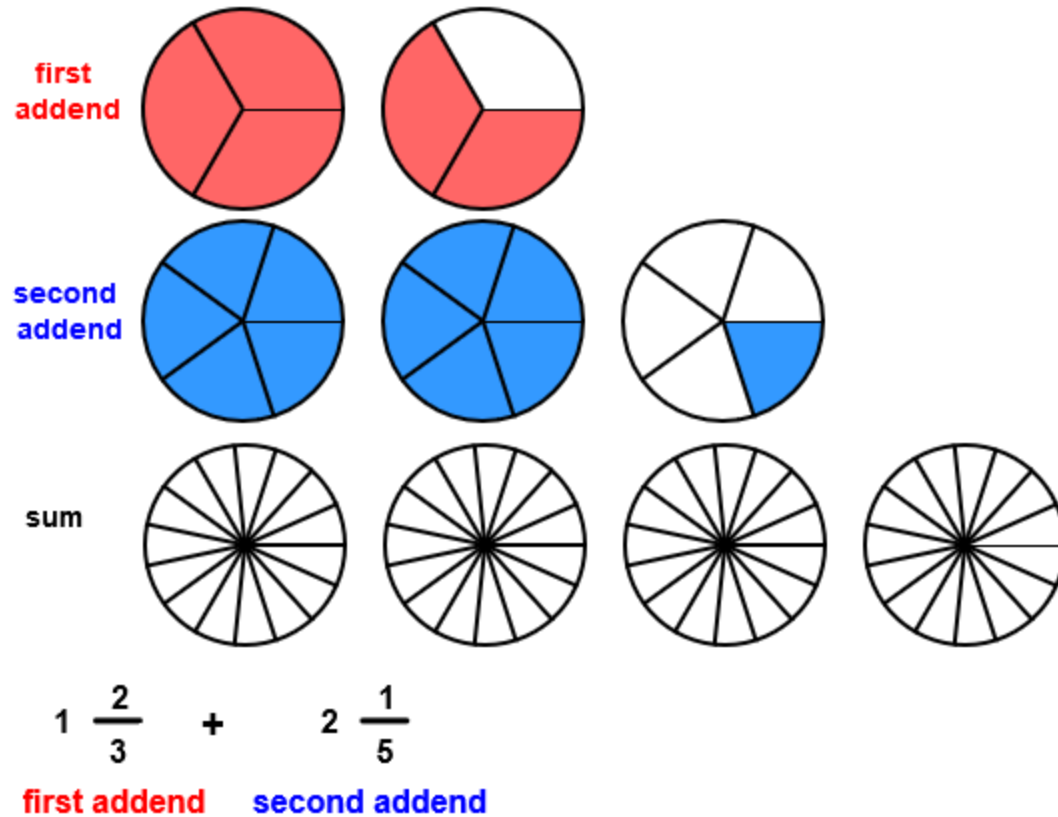
Add Fractions 10
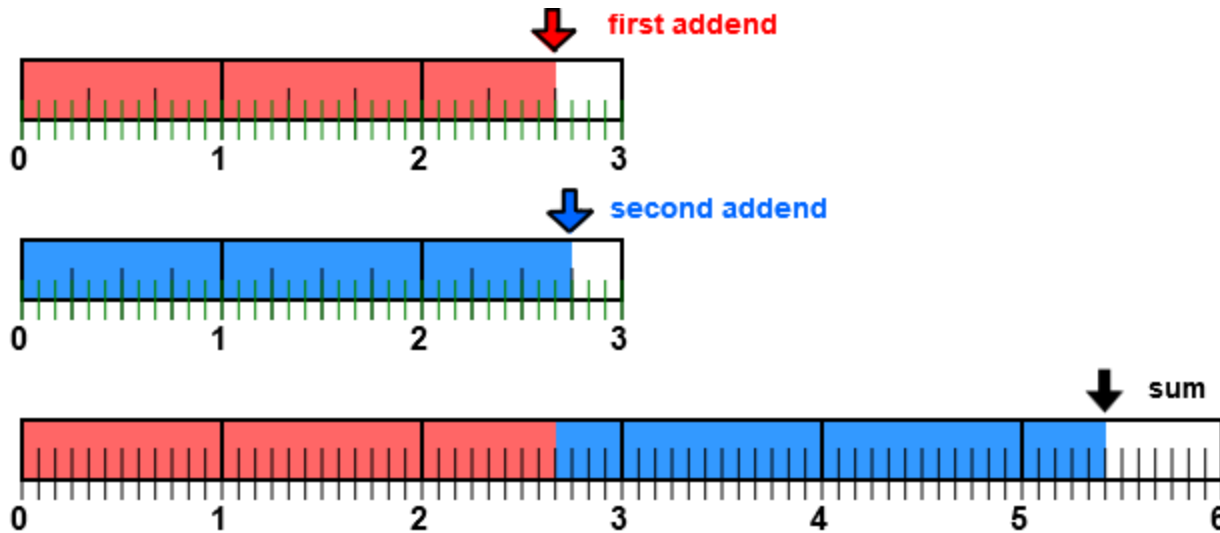
$$2\,\frac{2}{3} \quad + \quad 2\,\frac{3}{4} \quad = \quad (2+2)\,\frac{(8+9)}{12} \quad = \quad 4\,\frac{17}{12} \quad = \quad 5\,\frac{5}{12}$$

first addend   second addend   Write with common denominator 12. Then add.   Simplify

Write each *addend* with a common denominator 12. Because $\frac{17}{12}$ can be written as $1\frac{5}{12}$, we can write the *sum* $4\,\frac{17}{12}$ as $5\,\frac{5}{12}$.

Add Fractions 11

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

first addend   second addend

What is the *sum* of 1 **²/₃** and 2 **¹/₅**

Add Fractions 12

$$1 \frac{2}{3} \quad + \quad 2 \frac{1}{5} \quad = \quad (1+2) \frac{(10+3)}{15} = 3 \frac{13}{15} \quad = \quad 3 \frac{13}{15}$$

first addend   second addend   Write with common denominator 15. Then add.   Simplify
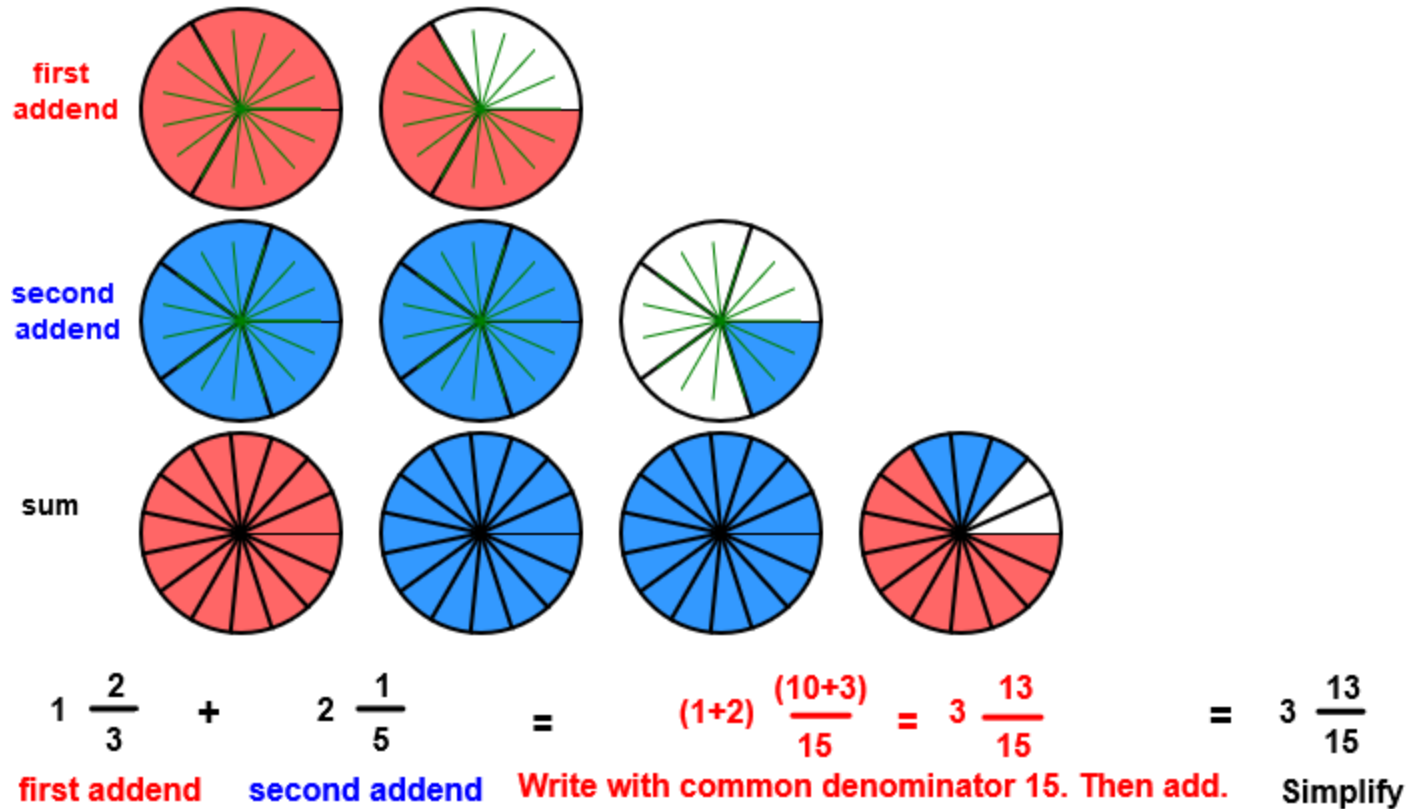
To find the sum from the picture, color the whole number parts of each addend onto the sum. So the first circle and the second and third circles will be colored in. Then color the fraction parts $^2/_3$ and $^1/_5$ onto the sum circles for a sum of 3 $^{13}/_{15}$. The illustration shows how the sum is calculated.