

ADDING MIXED FRACTIONS

Mixed fractions are fractional numbers that are larger than one. First we'll look at how to solve and justify adding mixed fractions with like denominators using fraction bars, and then practice adding mixed fractions with like denominators using paper and pencil.

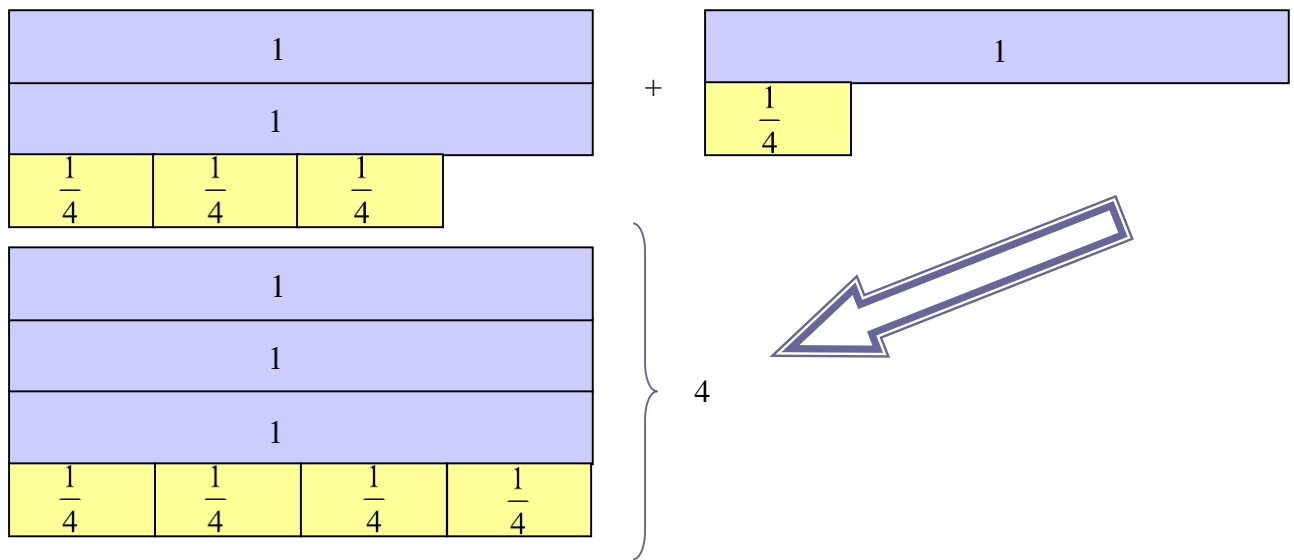
We'll expand our understanding of mixed fractions by adding mixed fractions with unlike denominators using fraction bars, and then practice adding mixed fractions with unlike denominators using paper and pencil.

Adding Mixed Fractions with Like Denominators Using Fraction Bars

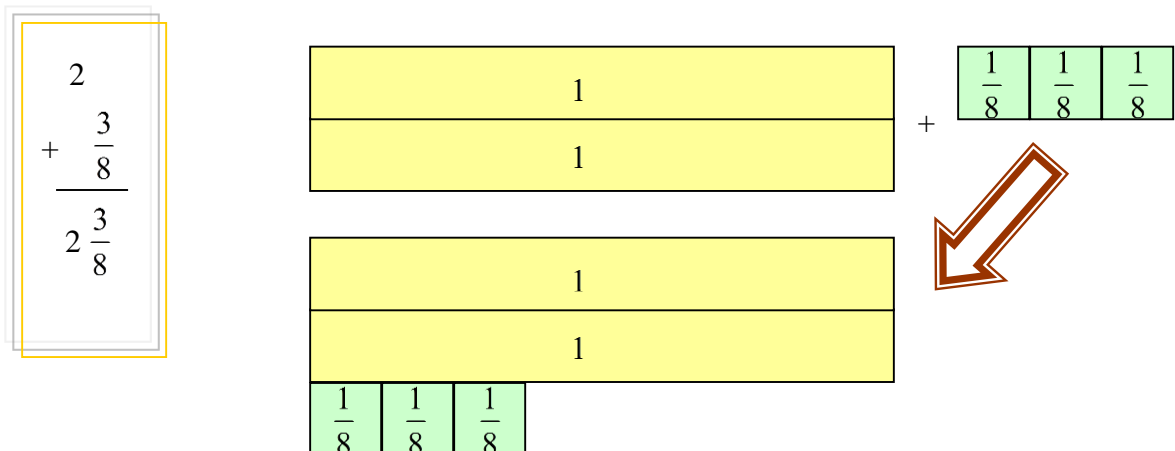
Study the two addition problems below. The solution is proven through the use of fraction bars.

Sample One

$$\begin{array}{r}
 2\frac{3}{4} \\
 + 1\frac{1}{4} \\
 \hline
 3\frac{4}{4} = 4
 \end{array}
 \quad
 \left(3\frac{4}{4} = 3 + 1 = 4\right)$$



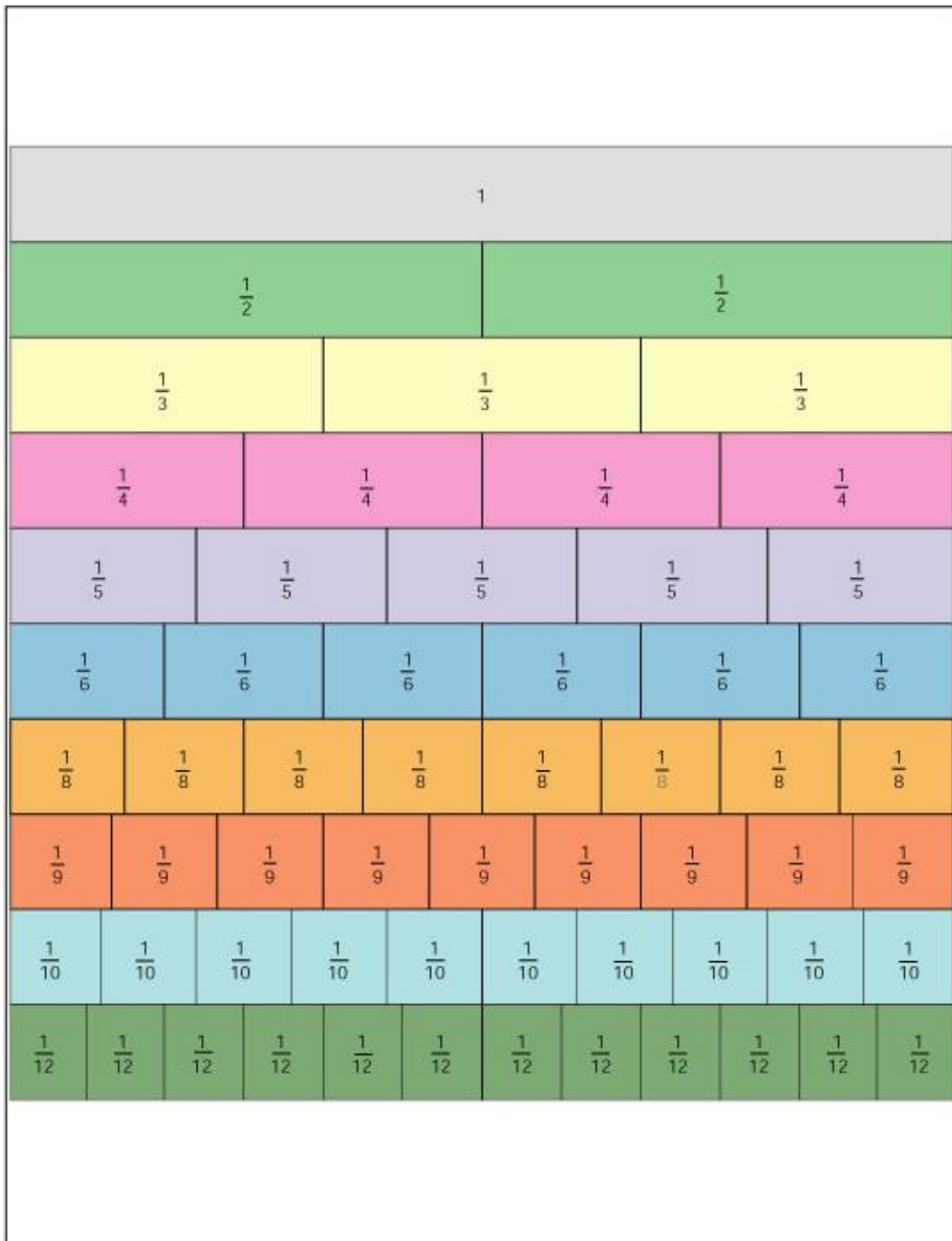
Sample Two



Fraction Bars

Look over these fraction strips. Each strip represents 1 whole.
 $1 = 2$ halves, 3 thirds, 4 fourths, 5 fifths, 6 sixths, and so on.

Thus, $1 = \frac{2}{2} = \frac{3}{3} = \frac{4}{4} = \frac{5}{5} = \frac{6}{6}$ and so on...



Adding Mixed Fractions

Shown below are two sample addition problems.

Sample One

Find $5\frac{1}{6} + 3\frac{5}{6}$

$$\begin{array}{r} 5\frac{1}{6} \\ + 3\frac{5}{6} \\ \hline 8\frac{6}{6} = 9 \end{array} \quad \left(8\frac{6}{6} = 8 + \frac{6}{6} = 8 + 1 = 9\right)$$

Sample Two

Find $2\frac{3}{4} + 8$

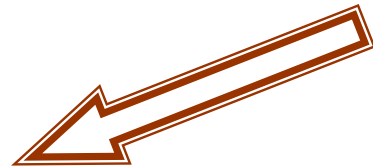
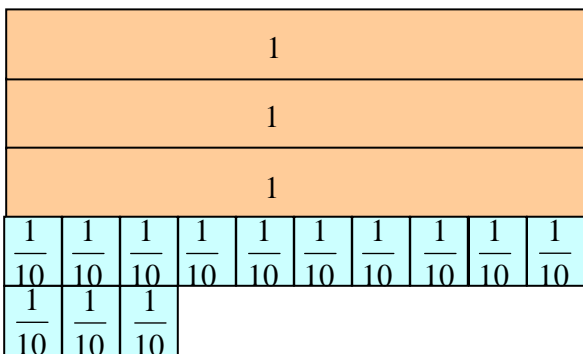
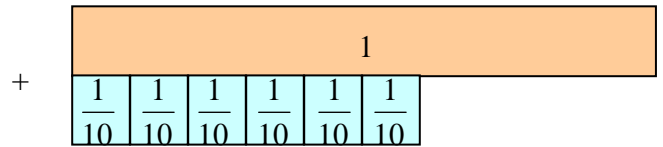
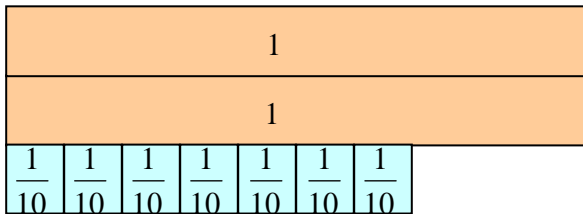
$$\begin{array}{r} 2\frac{3}{4} \\ + 8 \\ \hline 10\frac{3}{4} \end{array}$$

Adding Mixed Numbers with Unlike Denominators Using Fraction Bars

Study the addition problem below. To add fractions with unlike denominators, express the fractions into equivalent fractions with the same denominator. The solution is proven through fraction bars.

$$\begin{array}{r}
 2\frac{7}{10} = 2\frac{7}{10} \\
 + 1\frac{3}{5} = 1\frac{6}{10} \\
 \hline
 3\frac{13}{10} = 4\frac{3}{10}
 \end{array}$$

$$\left(3\frac{13}{10} = 3 + \frac{10}{10} + \frac{3}{10} = 3 + 1 + \frac{3}{10} = 4\frac{3}{10} \right)$$



Adding Mixed Numbers

To find the least common denominator (LCD)

1. List the multiples of both denominators
2. Find the first multiple that is common to both sets of multiples.

Find $3\frac{7}{9} + 2\frac{5}{6}$

Find LCD for 9 & 6.

List multiples of 9
 $9 = \{9, \mathbf{18}, 27, \dots\}$

List multiples of 6
 $6 = \{6, 12, \mathbf{18}, 24, \dots\}$

LCD is the first common factor in both sets.

LCM = 18

$$3\frac{7}{9} = 3\frac{14}{18}$$

$$+ 2\frac{5}{6} = 2\frac{15}{18}$$

$$5\frac{29}{18} = 6\frac{11}{18}$$

$$\frac{7}{9} \times \frac{2}{2} = \frac{14}{18} \text{ or say 9 divides into 18, 2 times, } 7 \times 2 = 14.$$

$$\frac{5}{6} \times \frac{3}{3} = \frac{15}{18} \text{ or say 6 divides into 18, 3 times, } 5 \times 3 = 15.$$

$$5\frac{29}{18} = 5 + \frac{18}{18} + \frac{11}{18} = 5 + 1 + \frac{11}{18} = 6\frac{11}{18}$$

or

$$\frac{29}{18} = 18 \overline{)29} \begin{array}{r} 1 \\ \underline{18} \\ 11 \end{array} = 1\frac{11}{18}$$

thus,

$$5\frac{29}{18} = 5 + 1\frac{11}{18} = 6\frac{11}{18}$$