

Grade 4 - Adding and Subtracting Fractions and Mixed Numbers - Lesson

Common Core 4.NF.B.3a, 4.NF.B.3b, 4.NF.B.3c, 4.NF.B.3d · maths-pdf.fr/en/

To add or subtract fractions with the same denominator, add or subtract the numerators and keep the denominator: $\frac{2}{8} + \frac{3}{8} = \frac{5}{8}$. A fraction can be decomposed into a sum of fractions with the same denominator. Mixed numbers can be changed to improper fractions to add or subtract them.

Grade 4 · Common Core State Standards: **4.NF.B.3a, 4.NF.B.3b, 4.NF.B.3c, 4.NF.B.3d**

Key facts

- With like denominators, add or subtract the numerators and keep the denominator.
- A fraction can be decomposed in more than one way, such as $\frac{5}{6} = \frac{2}{6} + \frac{3}{6}$.
- A mixed number such as $2 \frac{1}{4}$ equals the improper fraction $\frac{9}{4}$.
- To add mixed numbers, add the wholes and the fractions, then regroup when the fraction is greater than 1.
- To subtract mixed numbers, change them to improper fractions first.

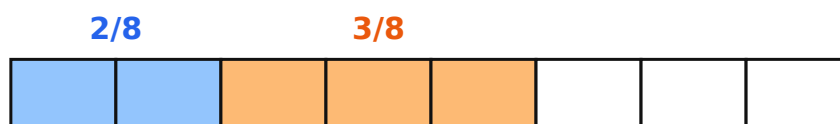
How do you add fractions with the same denominator?

A fraction like $\frac{2}{8}$ means 2 parts that are each one eighth. When the denominators are the same, the parts are the same size, so you add the numerators and keep the denominator.

Adding and subtracting like fractions

$\frac{a}{c} + \frac{b}{c} = \frac{a+b}{c}$ and $\frac{a}{c} - \frac{b}{c} = \frac{a-b}{c}$. The denominator names the size of the parts, so it stays the same.

Example: $\frac{2}{8} + \frac{3}{8} = \frac{5}{8}$.



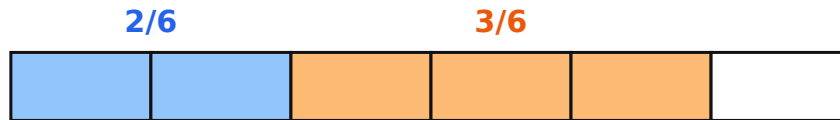
5 of 8 equal parts are shaded in all

2 eighths plus 3 eighths is 5 eighths.

Subtraction takes parts away: $\frac{7}{10} - \frac{3}{10} = \frac{4}{10}$.

How can you decompose a fraction?

To **decompose** a fraction means to break it into a sum of smaller fractions with the same denominator. There is more than one way. For example, $\frac{5}{6} = \frac{1}{6} + \frac{4}{6}$ and $\frac{5}{6} = \frac{2}{6} + \frac{3}{6}$. Every fraction is a sum of unit fractions: $\frac{3}{4} = \frac{1}{4} + \frac{1}{4} + \frac{1}{4}$.



$\frac{5}{6}$ can be split as $\frac{2}{6} + \frac{3}{6}$

One strip, two ways to see five sixths.

How do you work with mixed numbers?

A **mixed number** has a whole number and a fraction, like $2\frac{1}{4}$. An **improper fraction** has a numerator greater than or equal to the denominator, like $\frac{9}{4}$. They name the same amount.



2 wholes and 1/4

2 wholes and 1 fourth is 9 fourths.

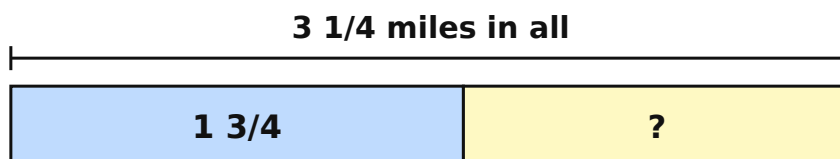
1. To change a mixed number to an improper fraction, write each whole as a fraction: $2 = \frac{8}{4}$.
2. Add the fractions: $\frac{8}{4} + \frac{1}{4} = \frac{9}{4}$.
3. To go back, divide: $9 \div 4 = 2$ remainder 1, so $\frac{9}{4} = 2\frac{1}{4}$.

How do you add and subtract mixed numbers?

Add the wholes and add the fractions. If the fraction part is greater than 1, regroup.

$$1\frac{3}{5} + 2\frac{4}{5} = 3\frac{7}{5} = 4\frac{2}{5}$$

To subtract, change both mixed numbers to improper fractions. $3\frac{1}{4} - 1\frac{3}{4} = \frac{13}{4} - \frac{7}{4} = \frac{6}{4} = 1\frac{2}{4}$.



The missing part is $3\frac{1}{4}$ minus $1\frac{3}{4}$.

Questions about adding and subtracting fractions and mixed numbers

How do you add fractions with the same denominator?

Add the numerators and keep the denominator the same. For $\frac{2}{8} + \frac{3}{8}$, add $2 + 3$ to get 5, so the sum is $\frac{5}{8}$.

Why do you keep the denominator the same?

The denominator tells the size of each part. Adding parts of the same size does not change their size, only how many there are.

How do you change a mixed number to an improper fraction?

Write the whole number as a fraction with the same denominator, then add. For $2\frac{1}{4}$, $2 = \frac{8}{4}$, and $\frac{8}{4} + \frac{1}{4} = \frac{9}{4}$.

How do you change an improper fraction to a mixed number?

Divide the numerator by the denominator. The quotient is the whole number and the remainder is the new numerator. For $\frac{11}{4}$, 11 divided by 4 is 2 remainder 3, so it is $2\frac{3}{4}$.

What do you do when the fraction part gets too big after adding?

Regroup. Take out whole numbers and keep the rest. For $3\frac{7}{5}$, $\frac{7}{5} = 1\frac{2}{5}$, so the sum is $4\frac{2}{5}$.