

Fraction Basics

A basic fraction has two parts: a numerator and a denominator.

$\frac{2}{3}$ ← Numerator

← Denominator

The numerator tells us **how many pieces we are interested in or are considering**.

The denominator tells us both **how many pieces make a whole** and **what size the pieces are that we are dealing with**. Dictionary.com says it means “A common trait or characteristic”, which gives us a good idea of why we must get a common denominator when we add and subtract.

One important thing to keep in mind is that the denominator pieces are equal in size.

What would you have if I gave you a nickel and a dime? We know that this is equivalent to 15¢ because we mentally change the nickel and dime into pennies (cents) and add them. This is an example of getting a common denominator to add! If we gave a nickel and a dime to someone from England, for example, they would tell us that what we have is two coins because they don't necessarily know the common value of the two coins.

There are two types of fractions we're going to be considering.

1. Proper fractions – the top is smaller than the bottom (fraction is less than a whole)

Examples: $\frac{2}{5}$, $\frac{7}{100}$, $\frac{12}{19}$, $\frac{3}{6}$, $\frac{123}{654}$

2. Improper fraction – the top is larger or equal to the bottom (fraction is more than or equal to a whole)

Examples: $\frac{5}{3}$, $\frac{19}{10}$, $\frac{6}{6}$, $\frac{81}{14}$, $\frac{12}{8}$

Mixed Numbers and Improper Fractions

Since improper fractions are equal to or larger than a whole, they can be written as a mixed number. A mixed number has a **whole part** and a **fractional part**.

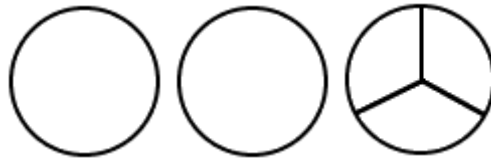
Whole part $\rightarrow 2\frac{2}{3}$ \leftarrow Fractional part

Change $2\frac{2}{3}$ into an improper fraction.

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

What is the rule that we learned to change a mixed number into an improper fraction?

Why does it work?



Notice that above, we are multiplying and then adding. Also notice that the denominator stays the same.

What do we do if we want to change an improper fraction into a mixed number?

Change $\frac{15}{4}$ into a mixed number.

$$\frac{15}{4}$$

$$4 \overline{)15}$$

What's going on here when we do this?



Again, the denominator stays the same, and this time we are dividing and subtracting. This is the opposite of what we did previously.