



## What is a Fraction? - Definition and Types

Fractions may be your friend's worst nightmare, but they don't have to be yours. Watch this video lesson to learn about fractions and how you can understand them easily. Also, learn to identify the different types of fractions.

### What Is a Fraction?

Fractions give some people nightmares, but this doesn't have to be you. Keep watching this video lesson, and you will come out with a better understanding of fractions. And hopefully, you won't feel so afraid of them.

We begin with a definition of what fractions are. A **fraction** simply tells us how many parts of a whole we have. You can recognize a fraction by the slash that is written between the two numbers. We have a top number, the **numerator**, and a bottom number, the **denominator**. For example,  $\frac{1}{2}$  is a fraction. You can write it with a slanted slash like we have or you can write the 1 on top of the 2 with the slash between the two numbers. The 1 is the numerator, and the 2 is the denominator.

What does this fraction mean? Well, if we picture a pie, the bottom number tells us how many slices to slice the pie, and the top number tells us how many of those slices we can have. So  $\frac{1}{2}$  tells us that we have sliced our pie into two slices, and we can take 1 of those slices. Isn't that half of the pie? So  $\frac{1}{2}$  of a pie is half a pie! Now that's a pretty big slice! Top it with whipped cream, and we are good to go!

Within the world of fractions, we do have several types and ways of writing them. Let's discuss these now.

### Proper and Improper Fractions

First, we have what we call 'proper' and 'improper' fractions. **Proper** fractions are those fractions where the numerator is less than the denominator. An **improper** fraction is a fraction where the numerator is greater than the denominator. For example, the fraction  $\frac{7}{8}$  is a proper fraction, where  $\frac{8}{7}$  is an improper fraction.

Think of it as trying to take your slices from just one pie. With a proper fraction, you can take all your slices from just the one pie, but with an improper fraction, you need more than one pie to get the number of slices that you need. The fraction  $\frac{7}{8}$  tells you to take 7 slices out of a pie with 8 slices. You can take all your slices from just the one pie. But the fraction  $\frac{8}{7}$  says that you need 8 slices from a pie that only has 7 slices. If your pie only has 7 slices, you can only take 7 slices from one pie. To get your 8th slice, you need a second pie that is also sliced into 7 slices from which you can take one slice to make your 8th slice.

You could say that improper fractions are greedy fractions because you need more than one whole pie to satisfy it. Proper fractions can be satisfied by taking slices from just one pie.

## Like and Unlike Fractions

Next, we have like and unlike fractions. **Like** fractions are those fractions that have the same denominator. **Unlike** fractions are those fractions that are different. For example, the fractions  $\frac{3}{4}$  and  $\frac{2}{4}$  are like fractions because they have the same denominator, 4. Just add the numerators and out the answer over 4 to get the sum.

Mathematically,  $\frac{2}{4}$  simplifies into  $\frac{1}{2}$  because we can divide both the top and bottom numbers by 2. When we can divide both the numerator and denominator by the same number, we should do so to simplify the fraction. For example, the fraction  $\frac{6}{9}$  can be simplified to  $\frac{2}{3}$  since we can divide the 6 by 3 and the 9 by 3 as well. 6 divided by 3 is 2, and 9 divided by 3 is 3, so  $\frac{6}{9}$  simplifies to  $\frac{2}{3}$ .

Equivalent fractions on the other hand are the same number.  $\frac{1}{2}$  and  $\frac{2}{4}$  are the same because if you divide both the top and bottom of  $\frac{2}{4}$  by 2 you get  $\frac{1}{2}$ ! Unlike fractions, on the other hand, are those fractions that are completely different. For example,  $\frac{2}{4}$  and  $\frac{6}{9}$  are unlike fractions because even when you simplify them, you get different fractions:  $\frac{2}{4}$  simplifies to  $\frac{1}{2}$ , while  $\frac{6}{9}$  simplifies to  $\frac{2}{3}$ . Now,  $\frac{1}{2}$  and  $\frac{2}{3}$  are definitely different fractions!

## Mixed Numbers

Now, lastly, we have **mixed numbers**, also called **mixed fractions**. These are your improper fractions written with a whole number and a proper fraction together. For example, our  $\frac{8}{7}$  fraction from before can be written as  $1 \frac{1}{7}$  to show that we need a whole pie and then 1 slice of a second pie to fulfill our 8 slices of a pie that is sliced into 7 slices.

We can write mixed numbers as we just did with a whole number in front of a fraction that uses the slanted slash, or we can write our whole number in front of a fraction where the numbers are on top of each other. Our whole number would be centered with the horizontal slash if that is the case. And now we are done with our lesson.

# Lesson Summary

So let's review what we've learned. We learned that **fractions** tell us how many parts of a whole we have. They are written with a top number, the **numerator**, and a bottom number, the **denominator**, separated with a slash. The slash can be a slanted slash or it can be a horizontal slash with the numerator on top of the denominator with a slash in between.

A **proper** fraction is a fraction where the numerator is less than the denominator. An **improper** fraction is a fraction where the numerator is larger than the denominator. **Like** fractions are fractions that have the same denominator. **Unlike** fractions are fractions that are different.

If you can divide the numerator and the denominator of a fraction by the same number, then you can simplify that fraction into its simpler form by performing the divisions. A **mixed number** is an improper fraction written with a whole number and a proper fraction together.

## Learning Outcomes

After you've completed this lesson, you'll have the ability to:

- Define fractions and identify the parts of a fraction
- Differentiate between proper and improper fractions
- Explain why you should simplify fractions and define like and unlike fractions
- Describe how to write a mixed number