

Grade 4 · Decimal Fractions and Decimal Notation · Lesson

Common Core 4.NF.C.5, 4.NF.C.6, 4.NF.C.7 · mathovore.fr

A decimal is a way to write a fraction with a denominator of 10 or 100. The digit after the decimal point shows tenths and the next digit shows hundredths, so $\frac{37}{100} = 0.37$. To compare decimals, line up the places and compare digit by digit, starting with the tenths.

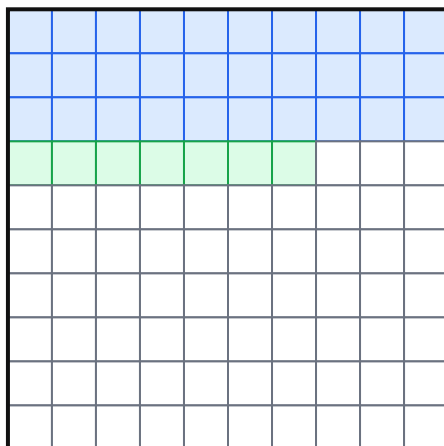
Grade 4 Common Core: 4.NF.C.5 · 4.NF.C.6 · 4.NF.C.7

Key facts:

- One tenth is $\frac{1}{10} = 0.1$ and one hundredth is $\frac{1}{100} = 0.01$.
- Ten hundredths make one tenth: $\frac{1}{10} = \frac{10}{100}$.
- A fraction with denominator 10 or 100 can be written as a decimal, and a decimal as a fraction.
- Add tenths and hundredths by renaming tenths as hundredths: $\frac{3}{10} + \frac{4}{100} = \frac{34}{100}$.
- Compare decimals place by place; $0.3 = 0.30$ is greater than 0.27 .

What are tenths and hundredths?

When a whole is cut into 10 equal parts, each part is one **tenth**, written $\frac{1}{10}$. When a whole is cut into 100 equal parts, each part is one **hundredth**, written $\frac{1}{100}$. Ten hundredths make one tenth, so $\frac{1}{10} = \frac{10}{100}$.



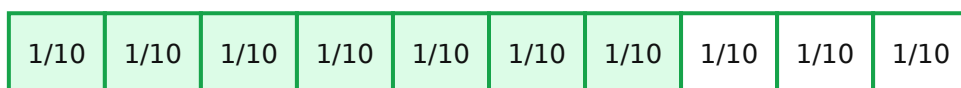
The blue rows are 3 tenths. The 7 green squares are 7 hundredths. Together: $\frac{37}{100} = 0.37$.

Decimal notation

A **decimal** is another way to write a fraction with a denominator of 10 or 100. The first digit after the decimal point counts tenths. The second digit counts hundredths. So $0.37 = \frac{37}{100} = \frac{3}{10} + \frac{7}{100}$.

How do you write a fraction as a decimal, and back?

Read the denominator to find the place. A denominator of 10 ends in the tenths place. A denominator of 100 ends in the hundredths place.



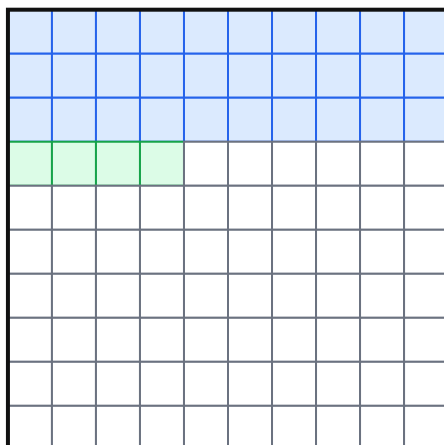
Seven tenths: $\frac{7}{10} = 0.7$.

Fraction	Decimal	In words
$\frac{7}{10}$	0.7	seven tenths
$\frac{9}{100}$	0.09	nine hundredths
$\frac{43}{100}$	0.43	forty-three hundredths
$\frac{30}{100}$	$0.30 = 0.3$	thirty hundredths

To change tenths to hundredths, multiply the numerator and denominator by 10: $\frac{7}{10} = \frac{7 \times 10}{10 \times 10} = \frac{70}{100}$. This is why 0.7 and 0.70 are equal.

How do you add tenths and hundredths?

Rename the tenths as hundredths first, then add the numerators. For $\frac{3}{10} + \frac{4}{100}$, write $\frac{3}{10} = \frac{30}{100}$, so the sum is $\frac{34}{100} = 0.34$.



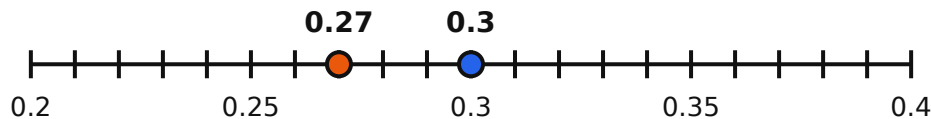
$$\frac{3}{10} + \frac{4}{100} = \frac{30}{100} + \frac{4}{100} = \frac{34}{100} = 0.34.$$

How do you compare decimals?

Two decimals can be compared only when they name parts of the same whole. Follow these steps:

1. Line up the decimal points and add zeros so both numbers have the same number of places.
2. Compare the tenths digits. If they differ, the larger digit wins.
3. If the tenths match, compare the hundredths.
4. Record the result with $<$, $>$, or $=$.

Example. Compare 0.27 and 0.3. Write 0.3 as 0.30. Since 30 hundredths is more than 27 hundredths, $0.27 < 0.3$. A longer decimal is not always larger.



On the number line, 0.27 is to the left of 0.3, so $0.27 < 0.3$.

Ones	Tenths	Hundredths
5	3	8

In 5.38, the 3 is worth 0.3 and the 8 is worth 0.08.

Decimal Fractions and Decimal Notation: frequently asked questions

What is a decimal fraction?

A decimal fraction is a fraction whose denominator is 10, 100, or another power of ten. In Grade 4 you work with tenths and hundredths, such as $\frac{6}{10}$ and $\frac{25}{100}$. You can write each one with a decimal point.

How do you write 0.05 as a fraction?

The 5 is in the hundredths place, so 0.05 is five hundredths: $\frac{5}{100}$. It is not five tenths. The zero in the tenths place shows there are no tenths.

Is 0.4 the same as 0.40?

Yes. Four tenths is equal to forty hundredths because $\frac{4}{10} = \frac{40}{100}$. Adding a zero at the end of a decimal does not change its value.

Why is 0.3 greater than 0.27 even though 27 is greater than 3?

Compare the same places. 0.3 has 3 tenths, and 0.27 has only 2 tenths. Written with hundredths, 0.30 is greater than 0.27.

How do you add $\frac{3}{10}$ and $\frac{4}{100}$?

Rename the tenths as hundredths: $\frac{3}{10} = \frac{30}{100}$. Then add the numerators:
 $\frac{30}{100} + \frac{4}{100} = \frac{34}{100}$, or 0.34.