

Fractions, Decimals, and Percents

In our system of numbers, we use several types of numbers such as whole numbers, decimals, fractions and percent. These different types of numbers relate to each other. We'll look at expressing fractions for decimals and then expressing decimals for fractions.

Percents are very important in the world of commerce and business. We will learn more about percents and what they mean. We will connect fractions and decimals with percents.

Decimals to Fractions

Fractions to Decimals

Percents

Percents, Decimals, and Fraction

Decimals to Fractions

Decimals may be written as fractions, and then simplified when possible.

4.53 is read as 4 and 53 hundredths and can be written as $4 \frac{53}{100}$.

$$\text{Thus, } 4.53 = 4 \frac{53}{100}.$$

(Notice, **two decimal places** gives **two zeros** in the denominator of the fraction.)

7.5 is read as 7 and 5 tenths and can be written as $7 \frac{5}{10}$.

(Notice, **one decimal place** gives **one zero** in the denominator of the fraction.)

$$7 \frac{5}{10} \div \frac{5}{5} = 7 \frac{1}{2}$$
$$\text{Thus, } 7.5 = 7 \frac{1}{2}.$$

6.250 is read as 6 and 250 thousandths and can be written as $6 \frac{250}{1000}$ or $6 \frac{1}{4}$.

(Notice, **three decimal places** gives **three zeros** in the denominator of the fraction.)

$$6 \frac{250}{1000} \div \frac{10}{10} = 6 \frac{25}{100}$$
$$6 \frac{25}{100} \div \frac{25}{25} = 6 \frac{1}{4}$$
$$\text{Thus, } 6.250 = 6 \frac{1}{4}$$

Fractions to Decimals

To write a fraction as a decimal, you can divide to find the decimal.

Example 1: Find the decimal for $\frac{3}{4}$.

To find the decimal for $\frac{3}{4}$, divide the denominator into the numerator and then add a decimal point and zeros until it comes out even.

$$\begin{array}{r} .75 \\ 4 \overline{)3.00} \\ \underline{28} \\ 20 \\ \underline{20} \end{array} \qquad \frac{3}{4} = 0.75$$

Some fractions do not make decimals that come out even and continue on forever when dividing. For them, divide and round to the given place.

Example 2: Find the decimal for $\frac{2}{3}$ and round to the nearest hundredth.

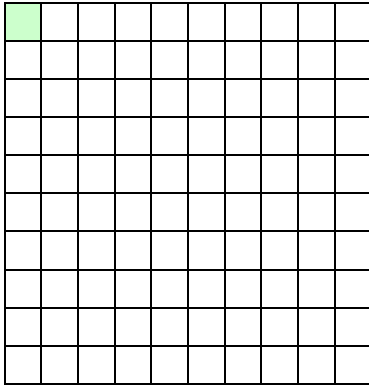
To find the decimal for $\frac{2}{3}$, divide to get one extra decimal place for rounding (in this case, divide through thousandths), stop, and then round.

$$\begin{array}{r} .666 \\ 3 \overline{)2.000} \\ \underline{18} \\ 20 \\ \underline{18} \\ 20 \\ \underline{18} \\ 2 \end{array} \qquad \frac{2}{3} \approx 0.67$$

Sometimes, repeating decimals are expressed with a bar over the repeating pattern in the decimal.

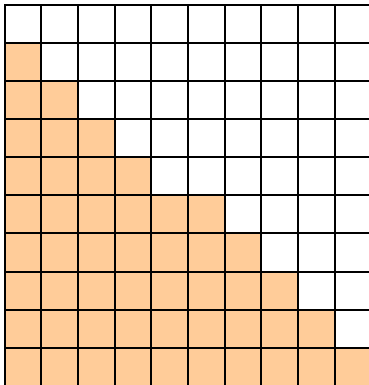
Two-thirds may be written as $0.\overline{6}$.

Percents

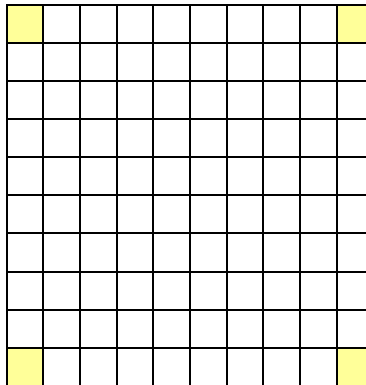


This grid measures 10 units by 10 units, thus the whole grid has 100 squares in it. Count them. Each square represents 1 percent (%) of the whole square block. 1% is shaded green.

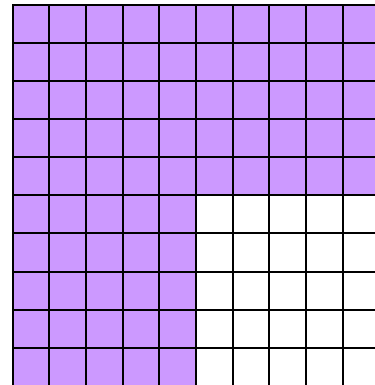
1% means 1 out of 100 or $\frac{1}{100}$ or .01



50 out of 100 are shaded orange or we could say 50% are shaded orange.



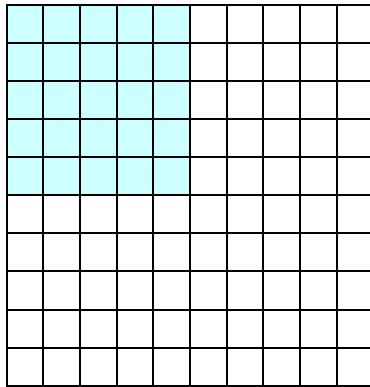
4 out of 100 are shaded yellow or we could say 4% are shaded yellow.



75 out of 100 are shaded lavender or we could say 75% are shaded lavender.

Percents, Fractions, and Decimals

The grid below shows 100 small squares. Twenty-five of the squares are shaded; thus, 25% are shaded. Notice that the decimal for 25% is 0.25 and the simplified fraction for 25% is 1/4.



$$25\% = \frac{25}{100}$$

$\frac{25}{100}$ is 25 hundredths or 0.25

$$\frac{25}{100} \div \frac{25}{25} = \frac{1}{4}$$

Percent → Decimal → Fraction

	35%
Decimal	0.35
Fraction	$\frac{35}{100}$ simplifies to $\frac{7}{20}$

Fraction → Percent → Decimal

	$\frac{2}{5}$
Percent	$\frac{2}{5} \times \frac{20}{20} = \frac{40}{100}$
Decimal	$\frac{40}{100} = 0.40 = 0.4$

Decimal → Fraction → Percent

	0.03
Fraction	$\frac{3}{100}$
Percent	3%