Converting fractions, decimals and percentages

Sunday, 12 April 2020 10:48 am

★ By the end of the lesson I would hope that you have an understanding and be able to apply to questions the following concepts:

- How to convert a percentage to a fraction
- How to convert a percentage to a decimal
- How to convert a fraction to a percentage
- How to convert a decimal to a percentage

RECAP

We have looked, in previous lessons, at consolidating the knowledge we should have retained from when we covered this work in Years 5, 6 and 7. Whilst rounding to a certain number of decimal places might be new content, the idea of fractions, decimals and percentages is not.

This lesson is going to build on the work already covered alongside your past understanding

RECAP: What is a fraction

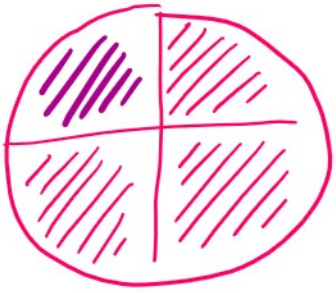
It is a part of something.
It's a way of expressing a section of something.
Think a slice of pizza.



This might represent $\frac{1}{8}th$ of my whole pizza.
This means I have one slice of a whole pizza which has been cut into 8 pieces.

A fraction is also a **numerator** and a **denominator**.

$$\frac{3}{4}$$



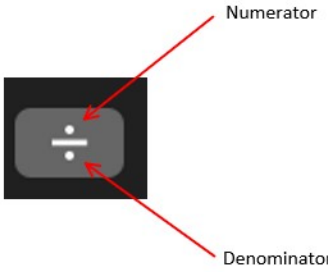
$\frac{1}{4}$ out of

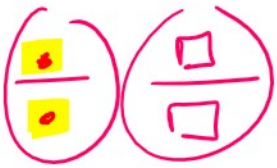
$\frac{2}{4} = \frac{1}{2}$

$\frac{4}{4} = 1$

$\frac{3}{4}$

The most important part of the fraction is the little line in between. It means **divide**.
It is no coincidence that the divide button on a calculator looks like a fraction!
The dots simply stand for the numerator and denominator.





Knowing the above means we can turn a fraction into a decimal.
Once we have that completed, we can turn decimals into percentages.

RECAP: What is a percentage

We like to have order in our lives.
We like things to be nice.

RECAP: What is a percentage

We like to have order in our lives.
We like things to be nice.
Hence there are 100 cents in a dollar, 100 cm in a metre, 100 years in a decade.
OK ... 60 seconds in a minute, but we can't have it perfect now can we!

Let's look at a question from the Year 12 Further Maths course.

Question: Is a person's attitude to gun control associated with their gender?

Table 3.1

	Sex	
Attitude	*Male*	*Female*
For	32	30
Against	26	12
Total	58	42

If we look at the information in the table, it might be hard to decide.
We notice that the number of Male and Females asked were different.
It would be awesome if we could find a way to comparing them.

Well we can.
We use percentages.
We "scale" each of the numbers and make it out of 100.

You are used to doing this with test scores.
You turn them into a percentage so you can compare how you have done with your best friend and across other tests.

So, we can turn the table above into a table of percentage:

Table 3.2

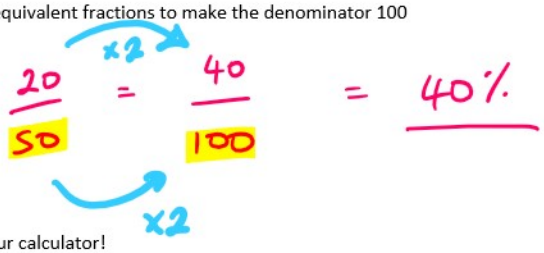
	Sex	
Attitude	*Male*	*Female*
For	55.2	71.4
Against	44.8	28.6
Total	100.0	100.0

Now we can see that there is a link between a person's gender and their attitude to gun control.

Percentages are awesome.

There are two ways of turning a number into a percentage.

1. Using equivalent fractions to make the denominator 100



2. Use your calculator!

Converting a percentage into a fraction

The % sign simply means that the number is "out of 100"
In other words it's a short cut way to write a fraction.

Hence, 23% is the same as $\frac{23}{100}$

$23\% = \frac{23}{100}$

Hence, 55% is the same as $\frac{55}{100}$ which would then need to be cancelled down to $\frac{11}{20}$

$55\% = \frac{55}{100} = \frac{11}{20}$

Short cut: Change the % sign to make the denominator of the fraction 100.

Examples

The following examples have been extracted, with permission, from the Cambridge Essentials Series of textbooks (Year 8 in this case).

Convert the following percentages to fractions or mixed numerals in their simplest form.

- 160%

$160\% = \frac{160}{100} = \frac{16}{10} = \frac{8}{5} = 1\frac{3}{5}$ (÷10, ÷2, ÷2, ÷10)

- 12.5%

$12.5\% = \frac{12.5}{100} = \frac{125}{1000} = \frac{25}{200} = \frac{5}{40} = \frac{1}{8}$ (×10)

$\times 2 \quad = \frac{25}{200}$

Converting a percentage into decimals

The % sign simply means that the number is "out of 100"
The words "out of" in Maths is a short cut for divided by.

We have already seen this in the example above.

We changed the denominator to 100.
This means to divide by 100.

Multiplying and dividing by 10, 100, 1000, 10000 is awesome as it returns to the ideas of place value again.

For each zero in the 10, 100, 1000, 10000 we simply "bounce" the decimal point one place.

When we **multiply** we move the decimal to the **right**.
When we **divide** we move the decimal point to the **left**.

Examples

The following examples have been extracted, with permission, from the Cambridge Essentials Series of textbooks (Year 8 in this case).

Convert the following percentages to decimals.

- 723%

$723\% = \frac{723}{100} = 723 \div 100 = 7.23$ (÷100: 2 places left)

$723. = 7.23$

- 13.45%

$13.45\% = 13.45 = 13.45 \div 100$ (÷100: 2 places left)

- 13.45%

$13.45\% = \frac{13.45}{100} = 13.45 \div 100$

$= 0.1345$

13. 45

Converting fractions into percentages

You do this all the time with test scores.
You do some form of calculation which will give you a decimal value and then you **multiply by 100.**

This is scaling your answer out of 100.

Short cut: Multiply the fraction by 100.

Remember: You can turn a whole number into a fraction by dividing it by 1.

Examples
The following examples have been extracted, with permission, from the Cambridge Essentials Series of textbooks (Year 8 in this case).

Convert the following fractions and mixed numerals into percentages.

$\frac{3}{5}$

$\frac{3}{5} = \frac{60}{100}$ 60%

×20

$\frac{7}{40}$

×2.5

$\frac{7}{40} = \frac{17.5}{100} = 17.5\%$

×2.5

DEC × 100 → %

$2\frac{1}{4}$ =

$2\frac{1}{4} = \frac{9}{4} = 2.25 \times 100 = 225\%$

$\frac{2}{3}$

$2 \div 3 = 0.\dot{6} \times 100 = 66.7\%$ (1 dp)

$= 66.\dot{6}\%$

$= 66\frac{2}{3}\%$

$0.666\ldots$

Converting decimals into percentages

The same process applies to turning fractions into percentages.
A decimal number can be turned into a percentage by multiplying it by 100.

This is back to Place Value again.

When you multiply by 100, you move the decimal point two places to the right.
Two zeros ... two places.

Examples

The following examples have been extracted, with permission, from the Cambridge Essentials Series of textbooks (Year 8 in this case).

Convert the following decimals to percentages.

- 0.458

$0.458 \times 100 = 45.8\%$

$0.458 \rightarrow 45.8$

- 17.5

$17.5 \times 100 = 1750\%$

$17.50. \rightarrow 1750$