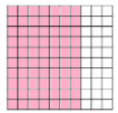
Converting FDP (R)

$\frac{70}{100}$ → This also means 70 ÷ 100 → 70 out of 100 squares → 70 "hundredths" = 7 "tenths" = 0.7 →  → 70 hundredths = 70%

Using a calculator: $\frac{\blacksquare}{\square}$ → S⇌D Convert to a decimal

× 100 converts to a percentage

Be careful of recurring decimals

eg $\frac{1}{3}$ = 0.3333333 = $0.\dot{3}$

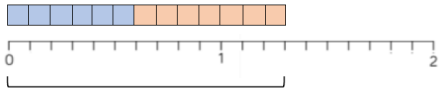
The dot above the 3

Add/Subtraction fractions (common multiples)

$\frac{3}{5} + \frac{7}{10}$

$\frac{6}{10} + \frac{7}{10}$

Addition/Subtraction needs a common denominator



$\frac{13}{10}$

Quick Multiplying and Cancelling down

$\frac{\cancel{3}^{1}}{5} \times \frac{4}{\cancel{9}_{3}}$

The 3 and the 9 have a common factor and can be simplified

Quick Solving

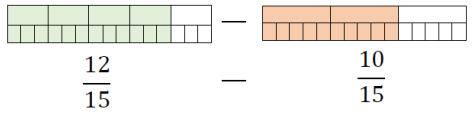
Multiply the numerators

Multiply the denominators

$\frac{1 \times 4}{5 \times 3} = \frac{4}{15}$

Add/Subtraction any fractions

$\frac{4}{5} - \frac{2}{3}$



$\frac{12}{15}$ — $\frac{10}{15}$ $= \frac{2}{15}$

Use equivalent fractions to find a common multiple for both denominators

Multiplying non-unit fractions

Shade in 3 parts

Repeat it on this many rows

$\frac{3}{4} \times \frac{2}{3}$

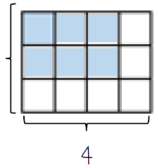
This many columns

This many rows

$\frac{3}{4} \times \frac{2}{3} = \frac{6}{12}$ ← Parts shaded

Total number of parts in the diagram

Modelled:



The reciprocal *When you multiply a number by its reciprocal the answer is always 1*

$3 \times \frac{1}{3} = 1$

$\frac{1}{3} + \frac{1}{3} + \frac{1}{3} = 1$

The reciprocal of 3 is $\frac{1}{3}$ and vice versa

Reciprocals for division

eg $5 \div \frac{1}{4} = 20$

$5 \times 4 = 20$

Multiplying by a reciprocal gives the same outcome

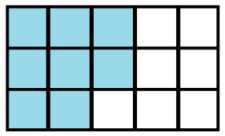
Dividing any fractions *Remember to use reciprocals*

$\frac{2}{5} \div \frac{3}{4}$

$\frac{2}{5} \times \frac{4}{3}$

Multiplying by a reciprocal gives the same outcome

Represented



$= \frac{8}{15}$

Southmoor Academy
ASPIRE · ACHIEVE · ENJOY

Find the percentage of an amount (Mental methods)

The whole represents 100%

10% = $\frac{1}{10}$ of the whole

0% 20% 40% 60% 80% 100%

10% = $\frac{1}{10}$ of the whole

50% = $\frac{5}{10} = \frac{1}{2}$ of the whole

20% = $\frac{2}{10} = \frac{1}{5}$ of the whole

5% = $\frac{1}{20}$ of the whole

Find 65% of 80

80

8 8 8 8 8 8 8 8 8 8

For bigger percentages it is sometimes easier to take away from 100%

Method 1
65% = 10% x 6 + 5%
= (8 x 6) + 4
= 52

Method 2
65% = 50% + 10% + 5%
= 40 + 8 + 4
= 52

Find the percentage of an amount (Calculator methods)

Using a multiplier

Find 65% of 80

Fraction, decimal, percentage conversion

65% = $\frac{65}{100}$ = 0.65 ← The multiplier

0.65 x 80 = 52

Using the percent button

Find 65% of 80

This brings up the % button on screen
You will see 65%

Type 65

Press SHIFT ((%)

Press × 80 and then press =

You can also use the calculator to support non calculator methods and find 1% or 10% then add percentages together

"of" can represent 'x' in calculator methods

Find the original value

Percentage calculations

Original amount × Multiplier = Final Value

In a test Lucy scored 60% of her questions correctly. Her score was 24. How many questions were on the test

Original x 0.6 = 24

24 ÷ 0.6 = 40 marks

10% = 6

100% = 40

60%

24

Total questions on test

A car sold for a profit £3000 with a profit of 20%. How much was the car originally?

100% 20%

£3000

Original x 1.2 = 3000

120% = £3000

10% = £250

100% = £2500

Percentage change R

I bought a phone for £200. A year later sold it for £125

100%

£200

£125

All values of change compare to the ORIGINAL value

Percentage loss

$\frac{75}{200}$ × 100 = 37.5%

$$\frac{Difference\ in\ values}{Original\ value} \times 100$$

I bought a house for £180,000. I later sold it for £216,000

100%

£180,000

Percentage profit

Money made (profit value) $\frac{36000}{180000}$ × 100 = 20%

Percentage Increase/ Decrease R

Decrease

100%

42%

Decrease by 58%

100 – 0.58 = 0.42 ← Multiplier Less than 1

Increase

100%

Increase by 12%

100% + 12% = 112%

100 + 0.12 = 1.12 ← Multiplier More than 1

Simple and compound interest

Simple Interest

James invests £2000 at 5% simple interest

100% 5%

£2000 £100

The original value increases by this amount every year

Compound Interest

Tess invests £100 at 10% compound interest for 3 years

£100 Original amount: £100

10%

£100 £10 Y1: £110

10%

£110 £11 Y2: £121

10%

£121 £12.1 Y3: £133.10

The multiplier 1.10 repeats each year

Reverse Percentages

40% of my number is 16. What am I thinking of?

Original Number (100%)

4 4 4 4 4 4 4 4 4 4

16

40% = 16
10% = 4
100% = 40

140% of my number is 84. What is the original number?

Original Number (100%)

6 6 6 6 6 6 6 6 6 6 6 6 6 6

84

140% = 84
10% = 6
100% = 60

Try to scale down to 10% or 1% and then scale back up to 100%

Repeated percentage change

Compound Interest

Tess invests £100 at 10% compound interest for 3 years

£100 x 1.10 x 1.10 x 1.10

£100 x 1.10 3

Original amount

Repeated multiplier

Number of occurrences

Depreciation

Depreciation calculations use multipliers **less than** 1

Multipliers are commutative – an overall multiplier effect can be calculated by combining the multipliers separately

e.g. Increase of 10% then a reduction of 10%

x 1.10 x 0.9

x 0.99 The multiplier