DECIMALS and PERCENTAGES — KNOWLEDGE ORGANISER —

Overview

tens, units
tentns, units
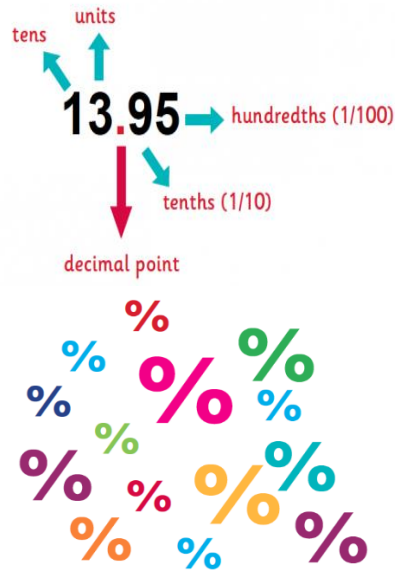**13.95** → hundredths (1/100)
tenths (1/10)
decimal point

Decimals and Percentages: we learn:

- Decimals up to 3 places
- Decimals as fractions
- Multiply/Divide by 10, 100, 1000
- Multiply/Divide decimals by integers
- Fractions to decimals
- Fractions to percentages
- Order fractions, decimals, percentages
- Percentages of an amount
- Equivalent fractions, decimals and percentages.

<u>Definition:</u> Decimals are a way of showing numbers that are not whole (like fractions). Decimals are 'in between' whole numbers, e.g. 8.3 is in between 8 and 9.
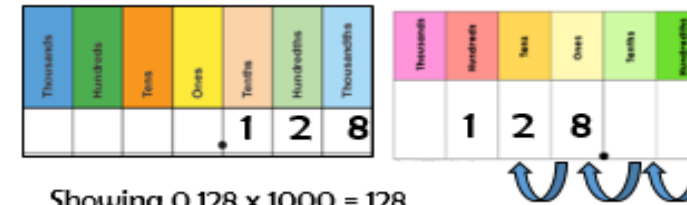
<u>Definition:</u> Percentages is a proportion of a whole number, expressed as a value out of a hundred. The symbol is %

Multiplying, Dividing and Rounding Decimals

Multiplying/Dividing by 10, 100, 1000

- When <u>multiplying</u> by 10, 100 or 1,000, move one, two, or three places <u>left</u> along the place value chart respectively.
- When <u>dividing</u> by 10, 100 or 1,000, move one, two, or three places <u>right</u> along the place value chart respectively.

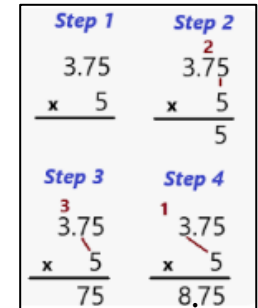Showing 0.128 x 1000 = 128

Rounding Decimals

- If the digit to the right of the rounding digit is 4 or below, we round down. If the digit to the right of the rounding digit is 5 or above, we round up.

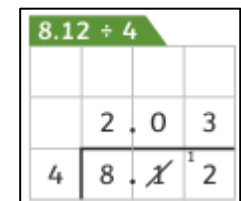0.22 to the nearest tenth is 0.2. 0.26 to the nearest tenth is 0.3.

Multiplying by Integers

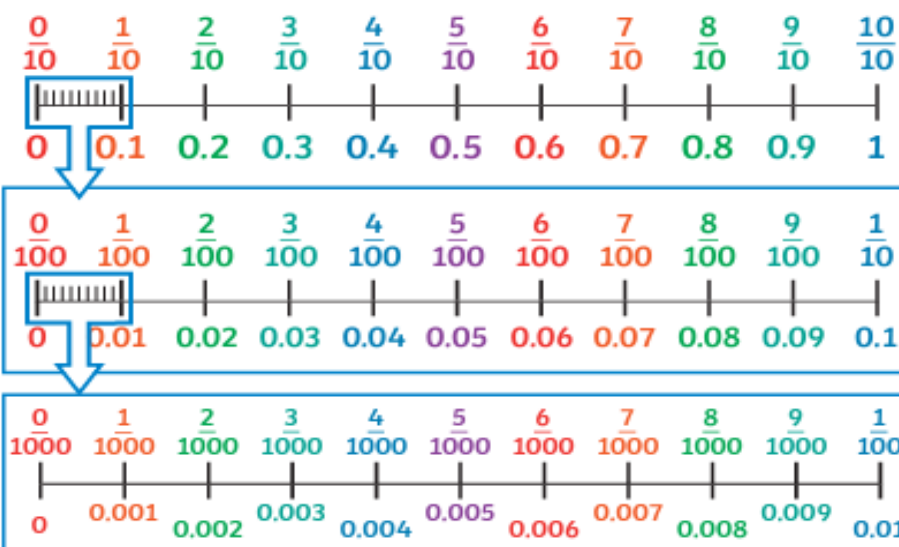Use column addition as you would for 3x1 multiplication. Remember to position the decimal point correctly throughout!

Step 1: 3.75 × 5
Step 2: 3.75 × 5 = 5
Step 3: 3.75 × 5 = 75
Step 4: 3.75 × 5 = 8.75

Dividing by Integers

Use short division. Remember to position the decimal point correctly throughout!

$8.12 ÷ 4$ = 2.03

Fractions, Decimals and Percentages Equivalency

$\frac{0}{10}$ $\frac{1}{10}$ $\frac{2}{10}$ $\frac{3}{10}$ $\frac{4}{10}$ $\frac{5}{10}$ $\frac{6}{10}$ $\frac{7}{10}$ $\frac{8}{10}$ $\frac{9}{10}$ $\frac{10}{10}$

0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1

$\frac{0}{100}$ $\frac{1}{100}$ $\frac{2}{100}$ $\frac{3}{100}$ $\frac{4}{100}$ $\frac{5}{100}$ $\frac{6}{100}$ $\frac{7}{100}$ $\frac{8}{100}$ $\frac{9}{100}$ $\frac{1}{10}$

0 0.01 0.02 0.03 0.04 0.05 0.06 0.07 0.08 0.09 0.1

$\frac{0}{1000}$ $\frac{1}{1000}$ $\frac{2}{1000}$ $\frac{3}{1000}$ $\frac{4}{1000}$ $\frac{5}{1000}$ $\frac{6}{1000}$ $\frac{7}{1000}$ $\frac{8}{1000}$ $\frac{9}{1000}$ $\frac{1}{100}$

0 0.001 0.002 0.003 0.004 0.005 0.006 0.007 0.008 0.009 0.01

One thousandth = 1/1000 = 0.001 = 0.1%

One tenth = 10/100 = 0.1 = 10%

One quarter = 25/100 = ¼ = 0.25 = 25%

One hundredth = 1/100 = 0.01 = 1%

One half = 50/100 = ½ = 0.5 = 50%

Three quarters = 75/100 = ¾ = 0.75 = 75%

Fractions to Percentages

Convert the denominator to 100 and apply the same operation to the numerator. Or, divide numerator by denominator and multiply the result by 100.

$$\frac{13 \times 5}{20 \times 5} = \frac{65}{100} = 65\%$$

Decimals to Percentages

To convert a decimal to a percentage, multiply by 100.

.275
2.75
27.5%

Move the decimal point to the right 2 places

Percentage: Missing Values/ Percentages of Amounts

Percentages of Missing Values

Use known facts and apply four operations.

If 20% = 300, what is the value of 100%?

20% x 5 = 100%
300 x 5 = 1500. 100% = 1500.

70% of children walked to school. 90 children did not walk to school. How many children at the school in total?

100% - 70% = 30%. Therefore 30% = 90.
If 30% = 90, then 10% = 30.
10% x 10 = 100%. 30 x 10 = 300.
There are 300 children in total.

Percentages of Amounts

To find 50% of an amount, divide by 2.

50% of 300 = 300 ÷ 2 = 150

To find 10% of an amount, divide by 10.

10% of 300 = 300 ÷ 10 = 30

To find 1% of an amount, divide by 100.

1% of 300 = 300 ÷ 100 = 3

Use four operations to find other percentages.

For 35% of 300, find 10%: 300 ÷ 10 = 30
Multiply 30 by 3 to find 30%, 30 x 3 = 90
For 5%, divide 10% by 2, 30 ÷ 2 = 15. 90 + 15 = 35% = 105

Key Vocabulary

Percentage   Discount   Equivalent Fraction   Equivalent Decimal   Convert   Recurring   Rounding (to 3 d.p)   Thousandth   Decimal Fraction