# Y7 Maths Knowledge Organiser Topic 11: Percentages 1

## What must I be able to do?

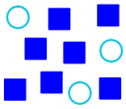
- ☐ Understand percentage as a fractional operator with denominator of 100
- ☐ Express a part of a whole as a percentage
- ☐ Convert between fractions, decimals and percentages
  - ➢ Sparx M264
- ☐ Find fractions and percentages of given quantities
  - ➢ Sparx M695, M684, M437, M905
- ☐ Find the whole given a part and the percentage
- ☐ Increase and decrease by a percentage
  - ➢ Sparx M476, M533
- ☐ Calculate simple interest

## Key vocabulary

| | |
|---|---|
| **Percentage** | A number or ratio expressed as a fraction out of 100. Per-cent means per-hundred *(or out of 100)*. |
| **Convert** | To change between percentages, decimals and fractions whilst keeping the value the same. |
| **Increase** | To increase something is to make it larger. |
| **Decrease** | To decrease something it to make it smaller or to take something away. |
| **Interest** | Interest is a percentage increase on a value over a period of time. |

## Express as a percentage %

Non calculator: Write as a fraction and then rewrite it as an equivalent fraction out of 100.



$\frac{3}{10}$ are circles. This is equivalent to $\frac{30}{100}$ which is 30%. 30% are circles and 70% are squares

## Converting between fractions, decimals and %s

Any fraction can be written as a decimal or as a % and vice versa.

| Fraction | Decimal | % | Fraction | Decimal | % |
|---|---|---|---|---|---|
| $\frac{1}{2}$ | 0.5 | 50% | $\frac{1}{1}$ | 1 | 100% |
| $\frac{1}{4}$ | 0.25 | 25% | $\frac{3}{4}$ | 0.75 | 75% |
| $\frac{1}{10}$ | 0.1 | 10% | $\frac{2}{10}$ | 0.2 | 20% |
| $\frac{1}{5}$ | 0.2 | 20% | $\frac{2}{5}$ | 0.4 | 40% |
| $\frac{1}{100}$ | 0.01 | 1% | $\frac{2}{100}$ | 0.02 | 2% |
| $\frac{1}{3}$ | $0.\dot{3}$ | 33.3% | $\frac{2}{3}$ | $0.\dot{6}$ | 66.6% |

Recurring symbol (the dot). Not the same as 0.3 or 0.6

- To turn a fraction into a decimal we divide the numerator by the denominator.
- To turn a decimal into a % we multiply it by 100.
- To turn a % into a fraction, just write it as a fraction out of 100 and simplify.

e.g. $\frac{5}{8} = 5 \div 8 = 0.625 = 62.5\% = \frac{62.5}{100} = \frac{125}{200} = \frac{5}{8}$

Using a calculator ×100 ×2 ÷25

## Finding a percentage of an amount (non calc)

To find this % of an amount:

- 50% we divide by 2 (as 2 x 50% = 100%)
- 25% we divide by 4 (as 4 x 25% = 100%)
- 10% we divide by 10 (as 10 x 10% = 100%)
- 1% we divide by 100 (as 100 x 1% = 100%)

We can use these to find other %s by dividing/multiplying or combining with other known %s : e.g.

5% is half of 10% so to find 5% we find 10% and ÷ 2

30% is 3 lots of 10% so find 10% and multiply by 3

75% is 50% plus 25% so we find 50% and 25% then add them together.

## Increase and decrease by a percentage

Find the percentage you are looking for and then for an increase add it to the original value or for a decrease subtract it from the original value.

e.g. Increase £120 by 30%.

10% of £120 is 120 ÷ 10 = £12

30% is 10% x 3 = £12 x 3 = £36

Therefore the new value is £120 + £36 = £156

e.g. Decrease £72 by 71%

50% of £72 is 72 ÷ 2 = £36

10% of £72 is 72 ÷ 10 = £7.20

20% is £7.20 x 2 = £14.40

1% is £72 ÷ 100 = £0.72

So 71% is £36 + £14.40 + £0.72 = £51.12

50% plus 20% plus 1% = 71%

Therefore the new value is £72 - £51.12 = £20.88