What are Sig Figs?

Significant Figures, or Sig Figs, are the numbers that have meaning in a measurement; zeroes are only present to make a measurement more specific. For example, if a measurement is 5.00 mL, the only number that has any meaning is 5, the zeroes are only present to make the measurement more specific. Therefore, 5.00 mL only has one Sig Fig..

How are Sig Figs determined?

When determining Sig Figs, always start by looking for a decimal. Sig Figs in a number with a decimal are counted from the left while Sig Figs in a number without a decimal are counted from the left. However, when counting from both the left or right, begin counting at the first non-zero number. This method also works for scientific notation.

Decimal Present (Read From Left)	Decimal Not Present (Read From Right)
15.2 cm: 3 Sig Figs	82 mi: 2 Sig Figs
205.00 mL: 5 Sig Figs	105 mm: 3 Sig Figs
0.75 km: 2 Sig Figs	700 cm: 1 Sig Fig
34.5×10^{6} mg: 3 Sig Figs	

How are calculations made with Sig Figs?

Significant Figures are also used to report the most appropriate number based on other relevant measurements. Therefore, they are very important when making calculations since they make sure calculated answers are just as specific as other measurements.

☆ Always make sure to write the units of measurement into your math for clarity ☆

- **Addition and Subtraction**

1. Determine the how many Sig Figs in the decimal portion the numbers you are using in your calculations have.
2. Add or subtract normally.
3. Express your answer with the same number of significant decimal places as the initial number that has the least number of significant decimal places. Round if necessary.

For example:
- 1.23 cm + 3.45 cm = 4.68 cm: Both initial numbers have 2 significant decimals, so the answer must have 2 significant decimals.
- 72.15 mm + 5.15 mm = 77.30 mm: Both initial numbers have 2 significant decimals, so the answer must have 2 significant decimals.
- 22.2 g + 5.55 g = 27.8 mL: Without rounding, the answer would be 27.75 mL, but since 22.2 mL only has 1 significant decimal, the answer can only have one significant decimal.
- 12 mi + 2.5 mi = 15 mi: Without rounding, the answer would be 14.5 mi, but since 12 mi has no significant decimals, the answer cannot have any significant decimals.

- **Multiplication and Division**

1. Determine the how many Sig Figs the numbers you are using in your calculations have.
2. Multiply or divide normally.
3. Express your answer with the same number of Sig Figs as the initial number that has the least number of Sig Figs. Round if necessary.

For example:
- 5.5 mm x 2.2 mm = 12.1 mm: Both initial numbers have 2 significant figures, so the answer must have 2 significant figures.
- 7.0 g / 2.0 mL = 3.5 g/mL: Both initial numbers have 2 significant figures, so the answer must have 2 significant figures.
- 2.50 mL x 5.0 mL = 13 mL: Without rounding, the answer would be 12.5 mL, but since 5.0 mL only has 2 Sig Figs, the answer can only have 2 Sig Figs.
- 250 cm / 1.75 min = 140 cm/min: Without rounding, the answer would be 142.857…, but since 250 cm only has 2 Sig Figs, the answer can only have 2 Sig Figs.