**Significant figures**

Significant figures (Sig Figs) are all of the numbers that you are certain of in a measurement, with the final number being a reasonable estimated guess.

**Rules for Sig Figs**

1. Non-zero digits are always significant.
2. Any zeros between two significant digits are significant.
3. A zero is significant only if it is preceded by a whole number **AND** a decimal point. A final zero or trailing zeros in the decimal portion ONLY are significant.

*Example: 0.500 or 0.632000 the zeros are significant*

*0.006 or 0.000968 the zeros are NOT significant*

1. In measurement that are 10 are larger, zeros without a decimal point at the end are NOT significant. Zeroes that end in a decimal point are significant.

*Example: 500. or 632000. these zeros are significant because of the decimal point*

*600 or 968000 these zeros are NOT significant*

For addition and subtraction use the following rules:

1. Count the number of significant figures in the decimal portion ONLY of each number in the problem.
2. Add or subtract in the normal fashion
3. Your final answer may have no more significant figures **to the right of the decimal** than the LEAST number of significant figures in any number in the problem.

 Example: 5122.103

+ 301.4 This is our column of uncertainty

+ 21.00345

+ 0.0511

5444.55755

**Therefore, our final answer must be rounded to 5444.6**

For multiplication and division use the following rule:

1. The **LEAST** number of significant figures in any number of the problem determines the number of significant figures in the answer. (You are now looking at **the entire number**, not just the decimal portion)

\*This means you have to be able to recognize significant figures in order to use this rule\*

Example: 5.26 has 3 significant figures

6.1 has 2 significant figures

5.26 x 6.1 = 32.086 but we can only report **32** as our answer

**Converting using Scientific Notation**

Convert from Scientific Notation to Real Number: 5.14 × 105 = **514000**

*Note that the above answer is still kept to 3 sig figs.*

If the problem was to convert 5.14000 × 105 to a real Number, the answer would be **514000**. (6 sig figs)

### Convert from Real Number to Scientific Notation: 0.000345 = 3.45 × 10-4

*Note that the above answer is still kept to 3 sig figs.*

If the problem was to convert 0.00034500to Scientific Notation, the answer would be **3.4500 × 10-4** (5 sig figs)