**Counting Significant Figures**

Measured values are never 100% precise. In general, the more significant figures there are in a measured value, the more precise it is, and the less uncertain it is. The following are rules for determining the number of significant figures (SFs) in a measured value:

- All non-zero digits are significant.
  
  79.34 °C has four SFs.

- Trapped zeros (between non-zero numbers) are significant.
  
  6.8005 x 10³ L has five SFs.

- Leading zeros (before non-zero numbers) are not significant.
  
  0.0571 s has three SFs.

- Trailing zeros (after non-zero numbers) are significant only if the decimal point in the measured value is explicitly shown. Otherwise, it is ambiguous.
  
  12.300 g has 5 SFs.
  0.770 cm has 3 SFs.
  4500 miles has 4 SFs.
  4500 miles is ambiguous, so assume only 2 SFs.

**Significant Figures in Calculations**

Calculators usually aren't smart enough to figure out the correct number of significant figures for you, so don't write down exactly what your calculator gives you when performing calculations with measured values! The following are rules for determining the appropriate number of significant figures to record in the result of a calculation involving measurements:

- For multiplication and division, the answer is reported with the same number of significant figures as the incoming value with the least number of significant figures.
  
  21.93 x 43.0 = 942.99 (calculator) = 943

- For addition and subtraction, the answer is reported with the same number of decimal places as the incoming value with the least number of decimal places.
  
  45.217 + 6.3 = 51.517 (calculator) = 51.5

**Rounding Off**

It is often necessary to round off values in order to report them with the appropriate number of significant figures. The following are rules for rounding off:

- If the digit to be dropped is < 5, round down. Drop that digit and all others to the right of it.
  
  99.3 → 99 to 2 SFs

- If the digit to be dropped is ≥ 5, round up. Increase the digit before it to the left by one.
  
  1249.8 → 1250. to 4 SFs
  0.3455 → 0.346 to 3 SFs