

Significant Figures and other Useful Information

Sig Figs

1. All non-zeros count $125,986 = 6$ sig figs
2. Zeros at the beginning **NEVER** count $0.00045 = 2$ sig figs
3. Zeros between non-zeros count $210,089 = 6$ sig figs
4. Zeros at the end of a number with out decimals do **NOT** count $120,000 = 2$ sig figs
5. Zeros at the end of a number with a decimal count $0.0007120 = 4$ sig figs

Rounding

1. If the digit to the immediate right of the last significant figure is 5 or greater, round up **$51.\underline{2}7 \rightarrow 51.3$**
2. If the digit to the immediate right of the last significant figure is less than 5, don't round **$51.\underline{2}4 \rightarrow 51.2$**

Accuracy

- How close to the bull's-eye
- How close the experimental value is to the accepted value
- The number of sig figs

Precision

- how close a **series of measurements** are to one another
- the repeatability of the measurements
- the number of places beyond the decimal
 - $\pm 1\text{mm}$ (least)
 - $\pm 0.1\text{ mm}$
 - $\pm 0.01\text{ mm}$ (most)

MAD ASP

- MAD – multiply or divide scientific data, round to least accurate entry
 - $(10.00\text{ cm})^2 \times (3.1415\dots)$
 - $=314.1592654$
 - $=314.2\text{ cm}^2$
- ASP – add or subtract scientific data, round to least precise entry
 - $$\begin{array}{r} 100.00\text{ g} \\ + 0.007\text{ g} \\ \hline 10.1\text{ g} \\ \hline 110.107\text{ g} \\ = 110.1\text{ g} \end{array}$$

Scientific Notation

- one number to the left of the decimal
- number of places the decimal moved is the exponent
- move the decimal to left = positive exponent
- move the decimal to right = negative exponent
- $0.000657 = 6.57 \times 10^{-4}$