

## Significant figures

<http://www.chemistry.ohio-state.edu/~grandine/teaching/Chem121/lectures/sigfigs/sigfigs.html>

<http://www.grandinetti.org/Teaching/Chem121/Lectures/SigFigCalcs/index.html>

### Purpose:

Report what you **know** experimentally (not more, not less). Precision is generally limited to what was measured and the inherent limits of the measuring device.

### Rule for integers and other non-measured quantities:

Be concerned with **measured quantities**. A 7 foot tall doorway does not imply exactly 7 feet. It means you only know one sig fig. If there are twice as many units of hydrogen as oxygen, twice means exactly 2, an integer. Sometimes, there is a certain amount of logic and reason involved in determining when a measurement is made versus when a number is exact (an integer). If a figure is a published, accepted figure, consider it to be precise (not measured). If you're not sure, ask.

### Rule for addition and subtraction:

Report digits you know for ALL numbers ("you know" = least precise)

### Rule for multiplication and division:

Report least sig figs of any measured quantity used in this step

### Using Significant Figures with Addition and Subtraction

Rule: With Addition and Subtraction keep only the number of decimals in the result that occur in the least precise number.

For example,

$$\begin{array}{r} 101.25 \\ + 3536.2 \\ + 123.448 \\ \hline 3760.898 \end{array}$$

← least precise number, only one digit after decimal

digits to be dropped

last digit retained

↓

3760.9

← answer round to one digit after the decimal

Note that only the final answer is rounded. **There is no rounding numbers in the intermediate steps** of the calculation.