

Significant Figures
 all of the numbers in a measurement
 (the ones we are certain about, plus the first uncertain number)

Rules for counting SF:

- 1) Some numbers have infinite number of SF
- counted numbers 89 students
 - definitions 1000 m = 1 km
 - "exact numbers" 2.54 cm = 1 in.
- 2) Nonzero integers are always significant: 1,234 = 4 SF's
- 3) Zeros:
- a) Captured zeros (between other digits) are always significant: 1001 = 4 SF's
 - b) Leading zeros (preceding other digits) are never significant: 0.001 = 1 SF's
 - c) Trailing zeros (to the right of other digits) can be ambiguous. Trailing zeros are significant only if the value includes a decimal point, or a dotted line separating significant from non-significant digits:

1,400 = 2 SF's	1,400. = 4 SF's	1,400.0 = 5 SF's
10,000 = 1 SF's	10,000. = 5 SF's	10,000.0 = 6 SF's
10,000.0 = 6 SF's	10,000. = 5 SF's	10,000.0 = 6 SF's

Rules for calculating with SF:

- Rule 1) Addition, subtraction, averages: Look at the decimal place.
- $$\begin{array}{r} 287.02 \\ + 2.1 \\ \hline 289.12 = 289.1 \end{array}$$
- Rule 2) Multiplying or dividing: Count the number of SF
- $$(2.562)(3.1)(1.1) = 8.87072 = 8.9$$

Rules for rounding off numbers:

- 1) If the digit to be dropped is less than 5, simply drop the digit.

$$8.921 = 8.9$$
- 2) If the digit to be dropped is greater than 5, increase the preceding digit by one.

$$7.6562 = 7.66$$
- 3) If the digit to be dropped is EXACTLY 5, then either drop it or increase the preceding digit by one, to make the last SF an OVEN number.

$$8.925 = 8.9$$

$$87.1500 = 87.2$$

Rules for setting up calculations:

- 1) Indicate what is being calculated
- 2) Show the equation
- 3) Proceed with the calculation in a logical sequence
- 4) Express intermediate answers with one non-significant digit (use a dashed line.)
- 5) Box the final answer with the appropriate number of SF's and units.