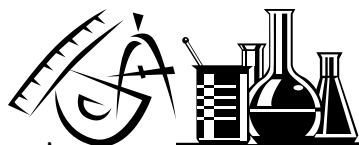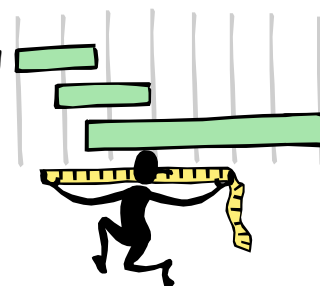# Significant Figures

Measuring with Significant Figures

1. Always estimate one place greater than the scale itself reads.
2. That last value is an educated guess.
3. Any values that you can measure are significant.

Identifying Significant Figures

1. All reported non zero digits in a value are significant.

    893 cm - 3 sig figs   12.345 in – 5 sig figs

2. All digits are significant if the value ends with a decimal point.

    8000. m – 4 sig figs   980. g – 3 sig figs

3. Zeroes to the right of the decimal point <u>and</u> to the right of a significant figure in a value are significant.

    5.0 cm – 2 sig figs   0.00341 m – 3 sig figs   500 in – 1 sig fig

4. Zeroes between significant figure in a value are significant.

    4002 g – 4 sig figs   3400.0 kg – 5 sig figs

Multiplication/Division with Significant Figures

1. Identify the number of significant figures in each value.
2. Multiply or divide the values
3. The value with the fewest significant figures will determine the number of significant figures in the answer.

42 m (2)	234 m (3)	3780 m (3)
x 2 m (1)	x 56 m (2)	x 45.6 m (3)
84 m^2	13184 m^2	172368 m^2
with sig figs **80 m^2** (1)	**13000 m^2** (2)	**172000 m^2** (3)
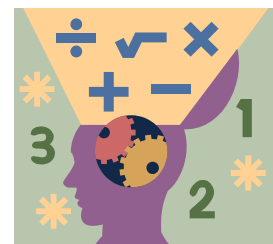
Addition/Subtraction with Significant Figures

1. Line up the decimal point of each value to be added or subtracted.
2. Locate the last significant figure in each value
3. Add or subtract the values
4. The significant figure furthest to the left of the original values will determine the location of the significant figure of the answer.

346.1cm + 45.98cm=?   65.85cm + 2100cm=?   92.6in - .212in=?

346.1 cm	65.85 cm	92.6 in
+ 45.98 cm	+ 2100 cm	- .212 in
392.08 cm	2165.85 cm	92.388 in
With sig figs **392.1 cm**	**2200 cm**	**92.4 in**

Significant Figures in Logarithms (pH & pOH)

1. Only those numbers to the right of the decimal place count as significant.

    pH=10.26 -2 sig figs and corresponds to a [H$^+$] = 5.5 x 10^{-11}M

    [H$^+$] = 1.9 x 10^{-9}M – 2 sig figs corresponds to a pH=8.72 -2 sig figs