

Chapter 2      Significant Digits ( or Sig Figs)

When measuring a physical quantity, the last digit of a measurement is typically an estimate.

When calculations are performed with measured values, some of the digits written are not necessarily "significant". That is, they do not represent a truly "determined" value.

Rules for determining a whether digits are significant:

**1. All non zero digits are significant**

for counting  
sig figs,  
you can ignore the  
 $\times 10^x$  stuff

123 km

3 SF

45.7 g

3 SF

~~6.11 x 10<sup>12</sup> Dollars~~

3 SF

2100 students

2 SF

## SD rules

1. All non zero digits are significant

2. All zeroes found between 2 other significant digits are significant

2002 meters      4 SF

57.05 cm        4 SF

1200 pg         2 SF

## SD rules

1. All non zero digits are significant.
2. All zeroes found between 2 other significant digits are significant.
- 3. All final zeroes to the right of a decimal point are significant.**

123. <u>0</u> cm	4 SF
5. <u>0</u> mg	2 SF
34.00 <u>0</u> nm	5 SF
0.423 m	3 SF
2. <u>00</u> 2 <u>00</u> liters	6 SF

## Sig. Fig. counting rules

1. All non zero digits are significant.
2. All zeroes found between 2 other significant digit are significant.
3. All final zeroes to the right of a decimal point are significant.

### **4. Place holder zeroes are not significant digits.**

0.00023 mm **2 SF**

303.3030 pm **7 SF**

0.002303 cm **4 SF**

2.000 dm **4 SF**

• 1000 sheep **1 SF**

## Rounding rules

rounding 34.57 to the tenths place.....

34.6

rounding 36.239 to the tenths place.....

36.2

When rounding numbers to a certain number of sig fig's:

1. count the number of sig figs starting from the left side of number
2. round the number to the last place you reached when counting  
(Follow rounding rules)

## Rounding #'s to a particular numbers of significant digits:

Round these to 3 sig fig's

3.567 cm  $\rightarrow$  3.57 cm

45.6277 cm  $\rightarrow$  45.6 cm

4.589 x 10<sup>-12</sup> km  $\rightarrow$  4.59 x 10<sup>-12</sup> km

1452  $\rightarrow$  1.45 x 10<sup>3</sup>

1450  $\rightarrow$  1.45 x 10<sup>3</sup>

Round these to one sig fig

2.65 m  $\rightarrow$  3 m

.0347 mg  $\rightarrow$  .03 mg

572 000 m<sup>3</sup>  
 $\rightarrow$  600 000 m<sup>3</sup>  
 $\rightarrow$  6 x 10<sup>5</sup> m<sup>3</sup>

5.8902 x 10<sup>12</sup> m  $\rightarrow$  6 x 10<sup>12</sup> m