

# Rules of Scientific Notation

$$\mathbf{a \times 10^b}$$

- 1. Coefficient (a) must be between 1 and 10.**
- 2. Take this times base 10.**
- 3. Exponent (b) is equal to number place values between where decimal *was* and where it *will be*.**
- 4. Sign on exponent:**
  - a. negative for std. numbers between 0 and 1 (e.g., 0.001).**
  - b. positive for std. numbers > 1.**

# Rules for Significant Digits (I)

If you are reading a measurement from some device or instrument, write all the certain digits (marks) plus one estimated (between marks).

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## Atlantic-Pacific Rule:

If the decimal point is present, start from Pacific side with first non-zero number and count all other numbers as significant.

If the decimal point is absent, start from Atlantic side with first non-zero number and count all other numbers as significant.

## **Rules for Significant Digits (II) in Calculations**

**The answer to a calculation using measured values cannot be more precise than any single value used.**

### **Multiplication and Division:**

**The answer to a multiplication or division problem must have as many significant digits as the measured value in the problem with the fewest number of significant digits.**

### **Addition and Subtraction :**

**The answer to an addition or subtraction problem must have as many significant digits as results by rounding the answer to the last (l to r) place value that all the values added or subtracted have in common.**

# Rules for Dimensional Analysis

(1) Write down “the given”.

(2) Write times sign (x).      (3) ... then fraction line.

(4) Write unit you want to cancel below line,  
the one you want to keep above the line.

NOTE: IT HELPS TO CONVERT TO BASE UNIT, THEN UNKNOWN.

(5) Write a *1* in front of the larger unit.

(6) Write how many smaller units make up larger unit.

(4, 5, and 6 complete your conversion factor.)

(7) Cancel units.

(8) Multiply everything across the top, then everything  
across the bottom.

(9) Divide what is left.      (10) Label your answer.

# The Metric System

