# Significant Figures Rules

Any digit in a measurement that is known with certainty plus one final digit, which is somewhat uncertain or estimated.

**Rules:**

1. All non-zero digits are always significant
2. Zeros appearing between non-zero digits are significant
    a. 40.7 L has 3 sig figs
    b. 87009 has 5 sig figs
3. Zeros appearing in front of non zero digits are not significant
    a. 0.009587 m has 4 sig digs
    b. 0.0009 kg has 1 sig dig
4. Zeros at the end of a number with no decimal point may or may not be significant. If the zero has been measured or estimated and not just a placeholder it is significant.
    a. 2000 m has 1 sig digit
    b. 2000. m has 4 sig digs
    c. If the value doesn't contain a decimal point assume none of the zeros at the end of a measurement are significant.
5. Zero at the end of a number and to the right of a decimal point are significant.
    a. 85.00 m has 4 sig digs
    b. 9.070000000 has 10 sig digs

**Calculations can Exaggerate Precision.**

**Multiplication and Division:**
Round the calculated result to the same number of significant digits as the measurement having the least number of significant digits.

**Addition and Subtraction:**
The answer can have no more digits to the right of the decimal point then there are in the measurement with the smallest number of digits to the right of the decimal point.

**Example Problems**

Determine the proper number of significant digits.

470. km  0.0980 m  30.8900 g

0.09709 kg  1000 g/1 kg  654.0 mole

Determine the correct number of significant digits in each of the following numbers as well as the correct number of significant digits in the answers.

12.345 + 13.23 = _____  5.3432 + 3.00 =_____

.0045 - .023 =_____  54.5554 – 0.34 =_____

45.43 X 2.3 =_____  0.03245 X 4.4=_____

5.677/ 2.33=_____  .0544/ .003=_____

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