Rules for Counting Significant Figures

Nonzero Integers- Always count as significant figures

3456 has 4 sig figs.

Zeros

- **Leading Zeros**: do not count as significant figures

  0.0486 has 3 sig figs.

- **Captive Zeros**: always count as significant figures

  16.07 has 4 sig figs.

- **Trailing Zeros**: are significant only if the number contains a decimal point

  9.300 has 4 sig figs

  (If zeros were known measured values, they would be significant)

  Ex- You carefully obtained a measurement of 300 meters rather than a rough rounded measurement, then the zeros would be significant.

  - Ambiguity is avoided if measurements are written in *scientific notation!*

    Ex) If all the zeros were significant in 300 meters, how would we write this #?

Practice...

1.0070 m

17.10 kg

100,890 L

3.29×10^3 s

0.0054 cm

3,200,000 km

Unlimited Sig. Figs.

- Two situations in which measurements have an unlimited amount of sig. figs.
    1. **Counting**-For example you count that there are exactly 24 people in this room-this measurement can only be a whole # & has an unlimited number of sig.figs to the right of the decimal. (24.000000.....)
    2. **Exact Quantities**-Quantities used within the systems of measurement. For example 60min=1hr

Rules for sig figs in mathematical operations

- ☐ Multiplication and Division

  # of significant figures in the result equals the # in the least precise measurement used in calculation

  (6.38)(2.0)=12.76→13 (2 sig figs)

  You try: 2.4526m / 8.4 =

- ☐ Addition and Subtraction

  # of decimal places in the result equals the number of decimal places in the least precise measurement

  6.8 + 11.934 = 18.734→18.7 (3 sig figs)

  You try: 74.626 m - 28.34m