

Uncertainty in Measurement and Significant Figures

Measurement:

Measurement: All measurements are uncertain. See Figure 2.5.

Use ruler to determine width of textbook. Use class data to determine certain and uncertain figures.

On in [class practice worksheet](#), sample of measurements. Record to correct amount of certainty.

Define “*Sig Figs*”: All certain plus the one (last) uncertain digit in measurement.

Ex. Q: Number of certain, uncertain, and sig figs in: 24.77 cm (A: 3,1,4)

Distribute In-Class Practice Worksheet

Rules for determining sig figs. P.25

Non-zero digits are always significant

Zero's:

Captive 0's: Zero's between non-zero (significant) digits are always significant. Ex: 205 (3), 1.032 (4)

Leading 0's: Zero preceding non zero digits are NOT significant

Trailing 0's: Zero's to the right of number are NOT significant, unless the number contains a decimal point. Ex: 100 (1), 100. (3), 100.0 (4). Write 100 to (2), 100 or better 1.0×10^2

Exact numbers: infinite number of sig figs. Ex. π , 100 in percent, counted numbers, conversion factors

Indicate the number of sig figs: P. 50 # 37,38, 139 [Practice worksheet in class](#)

Rewriting numbers to indicated number of sig figs.

Rounding off: (0-4 down, 5-9 up. Round off to correct sig figs at end of problem)

Using Scientific Notation

Maintaining in conversions:

Rounding Numbers: P 50, #41, 42 [Practice worksheet in class](#)

Calculations involving Sig Figs: (include units!)

Addition and Subtraction; (limit answer to smallest number of decimal places)

Ex. 24.50 g
 3.081 g
 36.2 g

Multiplication and Division: (limit sig figs in answer to least number of sig fig in measurement)

Ex. 356.2 m x 45.0 m = 0.2 g / 26.1 s =

Mixed Operations:

Ex. (29.7 g + 0.3g) / 0.0255 hr.

[Practice worksheet in class](#)