

Unit 1: Measurement Progress Check

Precision and Accuracy:

- 1) A student measures the mass of a piece of copper three times and records the results in the following table. The actual mass of the copper is 29.7 grams. Is the student's data precise, accurate, neither, or both?

Explain your answer using complete sentences. Be sure to address both the precision and accuracy of her data in your explanation.

Trial	Mass (grams)
1	26.5
2	26.4
3	26.5

The data is precise because they are close to each other.

The data is not accurate because it is not very close to the true value.

Average = 26.47g

Percent Error:

- 2) Using the data in the "Precision and Accuracy" problem above, calculate the percent error. Show your work. Round your final answer to two decimal places.

$$\frac{26.47 - 29.7}{29.7} \times 100 = -10.88\%$$

Sig Figs:

Determine the number of significant figures.

- 3) 300.0 4
 4) 105.060 6
 5) 0.0034 2 3
 6) 4.50×10^{-4} 3
 7) 200 1
 8) 1050 3
 9) 3400.0 5
 10) 190 2
 11) 2.30 3
 12) 104.0 4

Calculate the following. Observe the rules for significant figures in your final answer.

- 13) $15.0 \text{ g} + 1.230 \text{ g} + 0.05 \text{ g} = 16.3 \text{ g}$ (one decimal place)
 14) What is the density of an object that has a mass of 201.0 g and a volume of 11.050 mL?
 $\frac{201.0 \text{ g}}{11.050 \text{ mL}} = 18.19 \text{ g/mL}$ (4 sig figs)

Scientific Notation Progress Check

Convert the following numbers into scientific notation:

- 15) 0.00013 1.3×10^{-4}
 16) 0.00361 3.61×10^{-3}
 17) 392 3.92×10^2
 18) 6,926,300 6.9263×10^6

Take the following numbers out of scientific notation:

- 19) 1.92×10^3 1920
 20) 6.5×10^{-3} 0.0065
 21) 1.03×10^{-2} 0.0103
 22) 8.317×10^6 8,317,000