

Warm-Up #9

Answer each question. Show all work. Answers should be rounded to the correct number of digits and include appropriate units.

1. A student measures the mass of five individual beans. Calculate the average mass of the beans.

Bean 1	0.49 g
Bean 2	0.42 g
Bean 3	0.37 g
Bean 4	0.27 g
Bean 5	0.51 g

$$0.49 \text{ g} + 0.42 \text{ g} + 0.37 \text{ g} + 0.27 \text{ g} + 0.51 \text{ g}$$

$$= \frac{2.06 \text{ g}}{5} = 0.412 \text{ g} = \boxed{0.41 \text{ g}}$$

***Average = keep least # decimal places**

2. A student determines the volume of a piece of zinc using water displacement. His records his data in the table below.

- a. Calculate the volume of zinc.

$$3.90 \text{ mL} - 3.20 \text{ mL}$$

$$= 0.70 \text{ mL}$$

Mass of Zinc	5.11 g
Initial Volume of Water	3.20 mL
Final Volume of Water with Zinc	3.90 mL

- b. Calculate the density of zinc. ^{3 SF's}

$$D = \frac{\text{mass}}{\text{Volume}} = \frac{5.11 \text{ g}}{0.70 \text{ mL}} = \boxed{7.3 \frac{\text{g}}{\text{mL}}}$$

2 SF's

- c. The accepted density value of zinc is 7.13 g/mL. Calculate the student's percent error.

$$\% \text{ error} = \left| \frac{\text{Accepted} - \text{Experimental}}{\text{Accepted}} \right| \times 100$$

$$\% \text{ error} = \left| \frac{7.13 \text{ g/mL} - 7.3 \text{ g/mL}}{7.13 \text{ g/mL}} \right| \times 100 = \frac{0.17 \text{ g/mL}}{7.13 \text{ g/mL}} \times 100 = \boxed{3\%}$$