Putting Data in Lab Format

When reporting scientific data, certain guidelines are followed:

- Your data should be presented clearly, by recording each measurement in list or table form.
- Each measurement should have a label and unit.
- Any calculations that are done using some type of formula should first show the formula being used and then add data for the calculation.
- All reported calculations should be rounded to the correct number of significant figures.

Example 1:

Cylinder measurements:

Diameter (d) = 2.50 cm

Height (h) = 5.67 cm

Mass (m) = 25.62 g

If this volume is to be used in later calculations use the unrounded value, but look at the sig. dig. of all the data used to calculate this value when trying to decide how to round your final answer.

$$\text{Radius (r)} = \frac{d}{2} = \frac{2.50\,cm}{2} = 1.25\,cm$$

$$\text{Volume of cylinder (V)} = \pi r^2 h = \pi \cdot (1.25\text{cm})^2 \cdot 5.67\text{cm} = 27.81843\ \text{cm}^3$$

Rounded to ---> $27.8\ \text{cm}^3$

$$\text{Density of cylinder} = \frac{M}{V} = \frac{25.62\,g}{27.81843\,cm^3} = 0.920972\,\frac{g}{cm^3} = 0.921\,\frac{g}{cm^3}$$

Notice that the unrounded answer for volume is used above and the final answer is rounded to three significant digits after looking at all the data used to calculate both density and volume.

Example 2:

The above calculation can be done in one step by substituting the formula for volume in the density formula.

$$\text{Volume of cylinder (V)} = \pi\ r^2\ h$$

$$\text{Density} = \frac{M}{V} = \frac{M}{\pi\ r^2\ h} = \frac{25.62\,g}{\pi\ (1.25\,cm)^2\ 5.67\,cm} = 0.921\,\frac{g}{cm^3}$$

Example 3: Water Displacement

Initial Water Level (W_i) = 25.3 mL
Final Water Level (W_f) = 28.1 mL

Volume of object = W_f - W_i = 28.1 mL - 25.3 mL = 2.8 mL