PRACTICE

1. Determine the number of significant figures in each of the following.
   a. 804.05 g
   b. 0.014 403 0 km
   c. 1002 m
   d. 400 mL
   e. 30 000. cm
   f. 0.000 625 000 kg

Answer

1. a. 5
   b. 6
   c. 4
   d. 1
   e. 5
   f. 6

2. Suppose the value "seven thousand centimeters" is reported to you. How should the number be expressed if it is intended to contain the following?
   a. 1 significant figure
   b. 4 significant figures
   c. 6 significant figures

2. a. 7000 cm
   b. 7000. cm
   c. 7000.00 cm

Rounding

When you perform calculations involving measurements, you need know how to handle significant figures. This is especially true when y are using a calculator to carry out mathematical operations. The answe given on a calculator can be derived results with more digits than a justified by the measurements.

Suppose you used a calculator to divide a measured value of 154 g a measured value of 327 mL. Each of these values has three significa figures. The calculator would show a numerical answer of 0.4709480 The answer contains digits not justified by the measurements used calculate it. Such an answer has to be rounded off to make its degree certainty match that in the original measurements. The answer shou be 0.471 g/mL.

The rules for rounding are shown in Table 2-6. The extent of roun ing required in a given case depends on whether the numbers are bei added, subtracted, multiplied, or divided.

TABLE 2-6 ***Rules for Rounding Numbers***

If the digit following the last digit to be retained is:	then the last digit should:	Example (rounded to three significant figures)
greater than 5	be increased by 1	42.68 g ⟶ 42.7 g
less than 5	stay the same	17.32 m ⟶ 17.3 m
5, followed by nonzero digit(s)	be increased by 1	2.7851 cm ⟶ 2.79 cm
5, not followed by nonzero digit(s), and preceded by an odd digit	be increased by 1	4.635 kg ⟶ 4.64 kg (because 3 is odd)
5, not followed by nonzero digit(s), and the preceding significant digit is even	stay the same	78.65 mL ⟶ 78.6 mL (because 6 is even)