

Chapter 2

Supplementary Check for Understanding Problems

Scientific Notation

- Write each of the following values in proper scientific notation.
 - 0.2660 mg
 - 19,370 m
 - 0.00035900 g
 - 87.420 s
- Write each of the following values in decimal form.
 - 1.28×10^{-7} m
 - 4.33×10^4 L
 - 0.0506×10^4 kg
 - 669×10^{-5} cm³

Significant Figures

- How many significant figures are in each of the following measurements?
 - 33.04 L
 - 0.0099100 m
 - 2500 s
 - 6.1800×10^{-8} g
- Round off each of the following to 2 significant figures.
 - 2.65849 cm
 - 472.8 s
 - 0.028411 km
 - 17069 ft
- For each of the following, calculate the result and round it off to the proper number of significant figures. The units of these measurements have been omitted for clarity. Do not use a calculator.
 - $6.127 \times 10^5 + 4.53 \times 10^2 =$
 - $9.45 \times 10^{-2} - 2.66 \times 10^{-3} =$
 - $6.018 \times 10^{-3} \div 2.00 \times 10^{-7} =$

Unit Conversions

- Write the solution map for the conversion of TL into nL. What is the conversion factor for each step?
- How many meters does an automobile traveling 65 mph move in one second?

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3. Make each of the following conversion and express the answer in proper scientific notation.
 - a) 411 nm to cm
 - b) 1.19 g/mL to $\mu\text{g}/\text{kL}$
4. The price of gold recently reached \$1780 per ounce. What is the value of 150 g of gold at this price? Note that gold is priced by the troy ounce (1 lb = 14.58 troy ounces).
5. Express each of the following quantities as a value between 1 and 10 by converting them to the appropriate scaled SI unit.
 - a) 0.0025 L
 - b) 0.00000843 s
 - c) 1600 m
6. The average density of canola oil is 0.92 g/mL. What is the mass in grams of 1 gallon of canola oil.
7. Suppose you have a 295-g sample of aluminum (density = $2.7 \text{ g}/\text{cm}^3$) and a 438-g sample of iron (density = $9.0 \text{ g}/\text{cm}^3$). Which sample will occupy the larger volume?
8. Pure silver has a density of $10.5 \text{ g}/\text{cm}^3$ at room temperature. If a pure silver spoon is fully submerged in a graduated cylinder containing 26.50 mL of water and the water level rises to 28.11 mL, what is the mass of the spoon?
9. Imagine that you need special postage stamps that are sold in booklets at a cost of \$43.20 per 5 booklets. If each booklet contains 3 sheets of 6 stamps each and a total of 210 stamps are needed, what will be the cost of the stamps?

Problem-Solving Strategies

1. Suppose you wished to build a wooden box that will hold a ton of gravel. What additional information would you need in order to decide how much lumber to purchase for the construction of this box? Explain your reasoning.

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2. The data in the table below show various Fahrenheit temperatures and their corresponding Kelvin temperatures. Use this information to determine the equivalent Fahrenheit temperature when the Kelvin temperature is zero. Assume that Fahrenheit temperature is the independent variable.

°F	K
212	373
68	293
32	273
-40	233