

Name

Key

Period _____

Date _____

Unit 1 Math and Measurement

B

The SI base unit for the measurement of mass is the ____ ?

- A. ounce C. meter
B. kilogram D. liter

A

____ is the prefix meaning one-hundredth.

- A. centi- B. kilo- C. deci- D. milli-

A

A balance is used to measure the ____ of an object

- A. mass B. speed C. length D. temperature

C

The correct value for the length of a metal rod is 22.6 cm. Which of the following sets of measurements of this rod could be considered precise but not accurate?

- A. 22.5 cm, 22.7 cm, 22.6 cm
B. 12.6 cm, 22.6 cm, 32.6 cm
C. 20.1 cm, 20.2 cm, 20.1 cm
D. 24.6 cm, 23.7 cm, 25.9 cm

A

Density can be measured in ____.

- A. g/cm^3 B. g/s C. mL/g D. g/mL^3

D

The term *accuracy*, when used in measurement refers to which of the following?

- A. the amount of uncertainty in the measurement
B. the closeness of measurements to one another
C. the reproducibility of the measurement
D. the closeness of the measurement to the true value

B

The base unit of length in the SI system is the ____.

- A. millimeter B. meter C. gram D. centimeter

How many significant digits are there in the following measurements?

3 344 lbs.
3 0.987 g
4 3.405 m
2 0.00064 L

5 54.008 cm
4 3.400 mL
3 32.1 g
4 10.00 km

A piece of metal has a mass of 54.6 g and a volume of 34.5 mL. What is its density?

$$D = \frac{m}{V} = \frac{54.6}{34.5} = 1.58 \text{ g/mL}$$

The density of table salt is 2.164 g/mL. What is the volume of 20 grams of salt?

$$V_{\text{mL}} \cdot 2.164 \frac{\text{g}}{\text{mL}} = \frac{20 \text{ g}}{2.164 \text{ g/mL}} \cdot V_{\text{mL}} \quad V = 9 \text{ mL}$$

A lab technician determines the volume of a substance to be 35.70 mL. The mass of the substance is 147.2 grams. The literature value of density for the substance is 4.03 g/mL. What is the percent error of the density value the technician will obtain?

$$D = \frac{147.2 \text{ g}}{35.70 \text{ mL}} = 4.12 \text{ g/mL} \quad \left| \frac{4.12 - 4.03}{4.03} \right| \times 100 = \boxed{2.31\% \text{ error}}$$

The density of a liquid is 1.59 g/mL. The volume of the liquid is 3.42 mL. What is the mass of the liquid?

$$D = \frac{m}{V} \quad 1.59 \frac{\text{g}}{\text{mL}} = \frac{m}{3.42 \text{ mL}} \quad 1.59 \frac{\text{g}}{\text{mL}} \cdot 3.42 \text{ mL} = \boxed{5.44 \text{ g}}$$

A decigram is 0.1 g. Name the following quantities using the appropriate SI base units and prefixes.

milligram 0.001 g

kilogram 1000 g

centimeter 0.01 m

millimeter 0.001 m

Do the following conversions:

5 liters to centiliters

$$500 \text{ cL}$$

12.7 g to kilograms

$$12.7 \text{ g} \rightarrow 0.0127 \text{ kg}$$

How many mm are in 3.4 km?

$$3.4 \text{ km} \rightarrow 3400 \text{ m} \rightarrow 3,400,000 \text{ mm}$$

What is the number of seconds in an 8 hr workday?

$$8 \text{ hr} \times \frac{60 \text{ min}}{1 \text{ hr}} \times \frac{60 \text{ s}}{1 \text{ min}} = 28,800 \text{ s}$$

How many feet are in 2.36 km? (1 in = 2.54 cm)

$$2.36 \text{ km} \times \frac{1000 \text{ m}}{1 \text{ km}} \times \frac{100 \text{ cm}}{1 \text{ m}} \times \frac{1 \text{ in}}{2.54 \text{ cm}} \times \frac{1 \text{ ft}}{12 \text{ in}} = \boxed{7740 \text{ ft}}$$

Write the following numbers in standard scientific notation to the correct number of significant digits.

$$\underline{2.315364 \times 10^4} \quad 23453.64$$

$$\underline{1.0002 \times 10^4} \quad 10002$$

$$\underline{3.2 \times 10^{-3}} \quad 0.0032$$

$$\underline{4.325 \times 10^5} \quad 432.5 \times 10^3$$

$$\underline{2.3 \times 10^{-7}} \quad 0.0023 \times 10^{-4}$$