Chapter 1   Science Skills

Section 1.3 Measurement
(pages 14–20)

This section discusses units of measurement, making and evaluating measurements, and calculations with measurements.

Reading Strategy (page 14)

Previewing Before you read the section, rewrite the green and blue topic headings in this section as questions in the table below. As you read, write answers to the questions. For more information on this Reading Strategy, see the **Reading and Study Skills** in the **Skills and Reference Handbook** at the end of your textbook.

Measurement
Why is scientific notation useful?

Using Scientific Notation (pages 14–15)

1. Scientific notation expresses a value as the product of a number between 1 and 10 and _____.

2. Circle the letter of the value that is expressed as 3×10^8.

   a. 300   b. 300,000

   c. 30,000,000   d. 300,000,000

3. Why is scientific notation useful? _____

_____

SI Units of Measurement (pages 16–18)

4. Circle the letters of elements that are required for a measurement to make sense.

   a. scientific notation   b. numbers

   c. exponents   d. units

5. Is the following sentence true or false? Units in the SI system include feet, pounds, and degrees Fahrenheit. _____

Match the SI base unit with the quantity that is used to measure.

SI Base Unit	Quantity
_____ **6.** meter	a. Mass
_____ **7.** kilogram	b. Time
_____ **8.** kelvin	c. Length
_____ **9.** second	d. Temperature

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SI Prefixes			
Prefix	Symbol	Meaning	Multiply Unit By
giga-	G		1,000,000,000
mega-	M	million (10^6)	
kilo-	k	thousand (10^3)	1000
deci-	d		0.1
centi-		hundredth (10^{-2})	0.01
	m	thousandth (10^{-3})	0.001
	μ	millionth (10^{-6})	0.000001
nano-		billionth (10^{-9})	0.000000001

10. Complete the table of SI prefixes by filling in the missing information.

11. A ratio of equivalent measurements that is used to convert a quantity expressed in one unit to another unit is called a(n) _____.

Limits of Measurement (page 19)

12. Circle the letter of each expression that has four significant figures.

   a. 1.25×10^4 b. 12.51

   c. 0.0125   d. 0.1255

13. Is the following sentence true or false? The precision of a calculated answer is limited by the least precise measurement used in the calculation. _____

14. Calculate the density if the mass of a solid material is measured as 15.00 grams and its volume is measured as 5.0 cm^3? Round off your answer to the proper number of significant figures.

_____

15. Describe the difference between precision and accuracy. _____

_____

_____

Measuring Temperature (page 20)

16. Circle the letter of the base unit of temperature in SI.

   a. degree Fahrenheit (°F)   b. degree Celsius (°C)

   c. candela (cd)   d. kelvin (K)

17. Write the formula used to convert degrees Celsius to kelvins.

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