Name ______________________ Class ________________ Date ____________

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? It makes very large or very small numbers easier to work with.
What is SI? SI is a set of metric measuring units used by scientists.
What are base units? Base units are the fundamental units of SI. There are seven SI base units, including the meter, the kilogram, the kelvin, and the second.

Using Scientific Notation (pages 14–15)

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

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? It makes very large or very small numbers easier to work with.

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. false

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

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

SI Prefixes			
Prefix	**Symbol**	**Meaning**	**Multiply Unit By**
giga-	G	billion (10^9)	1,000,000,000
mega-	M	million (10^6)	1,000,000
kilo-	k	thousand (10^3)	1000
deci-	d	tenth (10^{-1})	0.1
centi-	c	hundredth (10^{-2})	0.01
milli-	m	thousandth (10^{-3})	0.001
micro-	μ	millionth (10^{-6})	0.000001
nano-	n	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) conversion factor.

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. true

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.

Density $= 15.00\ g/5.0\ cm^3 = 3.3\ g/cm^3$

15. Describe the difference between precision and accuracy. Precision refers to how exact a measurement is (the more significant figures, the more precise the measurement is), while accuracy refers to how close the measurement is to the actual value.

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.

K = °C + 273