Table 1.3 Common Decimal Prefixes Used with SI Units

Prefix*	Prefix Symbol	Meaning: Number	Meaning: Word	Exponential Notation
tera	T	1,000,000,000,000	trillion	10^{12}
giga	G	1,000,000,000	billion	10^{9}
mega	**M**	1,000,000	**million**	10^{6}
kilo	**k**	1,000	**thousand**	10^{3}
hecto	h	100	hundred	10^{2}
deka	da	10	ten	10^{1}
–	–	1	one	10^{0}
deci	**d**	0.1	**tenth**	10^{-1}
centi	**c**	0.01	**hundredth**	10^{-2}
milli	**m**	0.001	**thousandth**	10^{-3}
micro	**μ**	0.000001	**millionth**	10^{-6}
nano	**n**	0.000000001	**billionth**	10^{-9}
pico	**p**	0.000000000001	**trillionth**	10^{-12}
femto	f	0.000000000000001	quadrillionth	10^{-15}

*The prefixes most frequently used by chemists appear in bold type.

1. The Metric System

COMMON METRIC UNITS

Length

1 meter (m) = 100 centimeters (cm)
1 meter = 1000 millimeters (mm)
1 meter = 1,000,000 micrometers (μm)
1 meter = 1,000,000,000 nanometers (nm)
1 meter = 10,000,000,000 angstroms (Å)
1000 meters = 1 kilometer (km)

Mass

1 kilogram (kg) = 1000 grams (g)
1 gram = 1000 milligrams (mg)
1000 kilograms = 1 metric ton(t)

Volume

1 liter (L) = 1000 milliliters (mL) or
1000 cubic centimeters (cm^3)

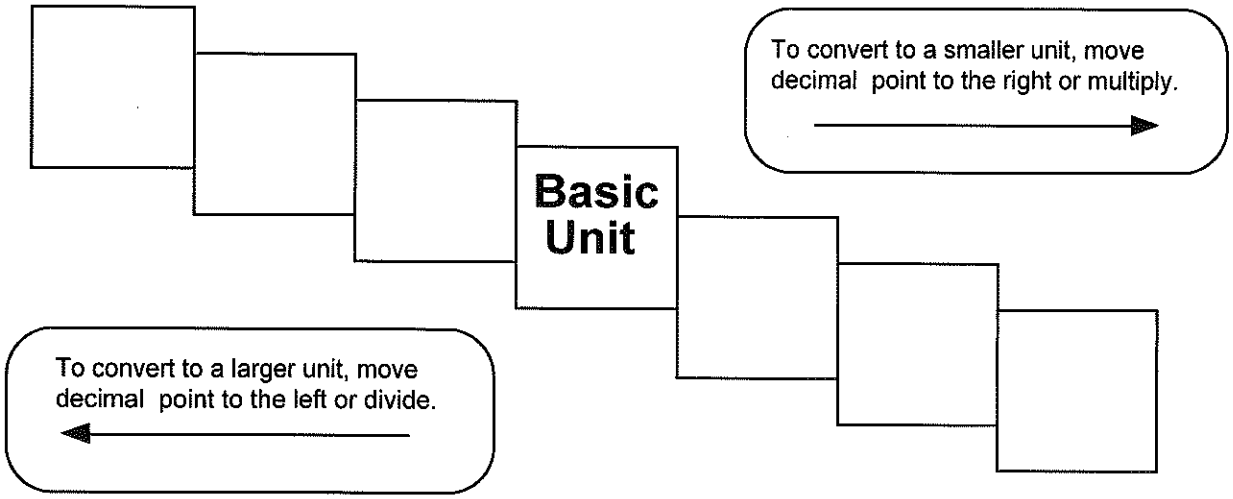
Temperature

0°C = freezing point of water
100°C = boiling point of water

kilo- = one thousand
centi- = one hundredth
milli- = one thousandth
micro- = one millionth
nano- = one billionth

Metric Mania
Conversion Practice

Name_____



Try these conversions, using the ladder method.

1000 mg = _____ g

1 L = _____ mL

160 cm = _____ mm

14 km = _____ m

109 g = _____ kg

250 m = _____ km

Compare using <, >, or =.

56 cm ◯ 6 m

7 g ◯ 698 mg

King Henry died unexpectedly drinking chocolate milk

km	*	*	m	*	cm	mm
kL	*	*	L	*	*	mL
kg	*	*	g	*	*	mg

King Henry died unexpectedly drinking chocolate milk

km	*	*	m	*	cm	mm
kL	*	*	L	*	*	mL
kg	*	*	g	*	*	mg

King Henry died unexpectedly drinking chocolate milk

km	*	*	m	*	cm	mm
kL	*	*	L	*	*	mL
kg	*	*	g	*	*	mg

Metric Mania

Name_____

Conversion Challenge

Write the correct abbreviation for each metric unit.

1) Kilogram _____
2) Meter _____
3) Gram _____
4) Milliliter _____
5) Millimeter _____
6) Liter _____
7) Kilometer _____
8) Centimeter _____
9) Milligram _____

Try these conversions, using the ladder method.

1) 2000 mg = _____ g
2) 104 km = _____ m
3) 480 cm = _____ m
4) 5.6 kg = _____ g
5) 8 mm = _____ cm
6) 5 L = _____ mL
7) 198 g = _____ kg
8) 75 mL = _____ L
9) 50 cm = _____ m
10) 5.6 m = _____ cm
11) 16 cm = _____ mm
12) 2500 m = _____ km
13) 65 g = _____ mg
14) 6.3 cm = _____ mm
15) 120 mg = _____ g

Compare using <, >, or =.

16) 63 cm ◯ 6 m
17) 5 g ◯ 508 mg
18) 1,500 mL ◯ 1.5 L
19) 536 cm ◯ 53.6 dm
20) 43 mg ◯ 5 g
21) 3.6 m ◯ 36 cm

Metric Worksheet

Name _____

Per. No. _____

1. 28 mℓ = _____ ℓ
2. 57 kg = _____ g
3. 36.8 cℓ = _____ kℓ
4. 62 mm = _____ m
5. 112 mg = _____ kg
6. 73 cm = _____ mm
7. 25.32 kℓ = _____ mℓ
8. 25.32 mℓ = _____ kℓ
9. 15 g = _____ kg
10. 42 ℓ = _____ mℓ

. 87 g = _____ mg

12. 35 m = _____ km
13. 48 mℓ = _____ kℓ
14. 51.25 g = _____ kg
15. 82.75 ℓ = _____ mℓ
16. 14 g = _____ mg
17. 55.2 cm = _____ mm
18. 38 cℓ = _____ kℓ
19. 24.48 m = _____ mm
20. 2,523 kg = _____ mg

Work space