

# UNITS AND MEASUREMENT

## Prefixes used in the metric system

1. mega	M	1,000,000	$10^6$
2. kilo	K	1,000	$10^3$
3. deci	d		$10^{-1}$
4. centi	c		$10^{-2}$
5. milli	m		$10^{-3}$
6. micro	u		$10^{-6}$
7. nano	n		$10^{-9}$
8. pico	P		$10^{-12}$

\*\* Example: 1 Km = 1000 meters

1 Kg = 1000 grams

## INTERNATIONAL SYSTEM BASE UNITS OF MEASUREMENT

<u>QUANTITY</u>	<u>NAME OF UNIT</u>	<u>ABBREVIATION</u>
Length	Meter	m
Mass	Kilogram	Kg

Temperature	Kelvin	K
Amount of Substance	Mole	Mol
Time	Second	S
Electric Current	Ampere	A

### UNITS OF LENGTH

<u>UNIT</u>	<u>ABBREVIATION</u>	<u>EXPONENT</u>
Kilometer	Km	$10^3$ m
Meter	m	$10^0$ or 1 m
Decimeter	dm	$10^{-1}$ m
Centimeter	cm	$10^{-2}$ m
Millimeter	mm	$10^{-3}$ m
Micrometer	um	$10^{-6}$ m
Nanometer	nm	$10^{-9}$ m
Angstrom	A	$10^{-10}$ m

### METRIC UNITS OF MASS

<u>UNITS</u>	<u>ABBREVIATION</u>	<u>GRAM EQUIVALENT</u>
Kilogram	Kg	1000 g
Gram	g	1 g
Decigram	dg	.1 g
Centigram	cg	.01 g
Milligram	mg	.001 g
Microgram	ug	.000001 g

\*\* Examples: 1 g = 1000 mg, 1Kg = 1000 g  
1 Kg = 2.2 lbs., 1lb = 454 g

### MEASUREMENT OF VOLUME

1 L = 1000 ml = 1000 cm<sup>3</sup>

1 ml = 1 cm<sup>3</sup>

1 L = 1.057 qt.

946 ml = 1 qt.

### TEMPERATURE

$K = C + 273$

$F = (1.8 \times C) + 32$

$C = (F - 32) / 1.8$

### METRIC EQUIVALENTS CHART

<u>UNITS</u>	<u>MULTIPLY BY</u>	<u>TO GET</u>
cm	.39	inches
inch	2.54	cm
foot	30.48	cm
yard	.9144	meters
meter	39.37	inches
meter	1.0936	yards

Km	.62137	miles
mile	1.6093	Km
gram	.035	ounces
ounce	28.35	gram
Kg	2.2	pounds
pounds	.4536	Kg

### **Practice Problems**

1. How many centimeters are in 2 feet?
2. Convert 155 mg to grams.
3. How many milliliters are contained in 3.5 liters?
4. The temperature for December 1 was 110 degrees F. Calculate this temp in degrees C.

### **SOLUTIONS**

1. ft → cm

$$(2 \text{ ft}) (30.48) = 60.96 \text{ cm}$$

2. mg → g

$$155 \text{ mg} (1 \text{ g} / 1000 \text{ mg}) = .155 \text{ g}$$

3. L → mL

$$3.5\text{L} (1000 \text{ mL} / 1\text{L}) = 3500 \text{ mL}$$

4.  $C = (F - 32) / 1.8$

$$110 - 32 / 1.8 = 43.3 \text{ }^\circ\text{C}$$

**\*\*More Problems (Show ALL work for full credit)**

- 1 Convert 80 yards to meters.

2. Convert 27 hours to minutes.
3. Convert 3 quarts to liters.
4. Convert 3 quarts to milliliter.
5. Convert 12 ounces to grams.
6. Convert 127 inches to centimeters.
7. Convert 15 centiliters to liters.
8. Convert 120 mm to inches.
9. Convert 5 pounds to grams.
10. Convert 1 year to seconds.
11. Convert 18 inches to meters.
12. Convert 3.7 meters to inches.
13. Convert 85 feet to meters.
14. Convert 270 grams to pounds.
15. Convert 90 kg to pounds.
16. Convert 154 milligrams to grams.
17. Convert 9 grams to milligrams.
18. Convert 18 pounds to grams.
19. Convert 10,500 grams to kg.
20. Convert 16 quarts to milliliters.