

## **Nursing Math**

### Using the Metric System

Basic Units: Volume—Liter (L)  
Mass—Gram (g)  
Length—Meter (m)



The four most commonly used prefixes of the metric system involved with the calculations of drug dosages are:

1. micro as in microgram (mcg)  
micro means one millionth or 0.000001  
  
one gram is the same as 1,000,000mcg or  
one microgram is the same as 0.000001g
2. milli as in milligram (mg)  
milli means one thousandth or 0.001  
  
one gram is the same as 1,000mg or  
one milligram is the same as 0.001g
3. centi as in centimeter (cm)  
centi means one hundredth or 0.01  
  
one meter is the same as 100cm or  
one centimeter is the same as 0.01m
4. kilo as in kiloliter (kL)  
kilo means one thousand or 1000  
  
one Liter is the same as 0.001kL or  
one kiloliter is the same as 1000L

To convert from one metric unit to another involves moving the decimal point in a measurement to the left or right.

To convert from kiloliters to liters to centiliters to milliliters to microliters involves moving the decimal to the **right** the appropriate number of places and adding zeroes if necessary.

kL-1-2-3-L-1-2-dL-1-mL-1-2-3-mcL

5.8947kL = 5,894.7L = 589,470cL = 5,894,700mL = 5,894,700,000mcL

To convert from micrograms to milligrams to centigrams to grams to kilograms involves moving the decimal to the **left** the appropriate number of places and adding zeroes if necessary.

mcg-1-2-3-mg-1-cg-1-2-g-1-2-3kg

163.098mcg = 0.163098mg = 0.0163098cg = 0.000163098g = 0.000000163098kg

## Important Conversions

$$1\text{g} = 1,000\text{mg} = 1,000,000\text{mcg}$$

$$1\text{mg} = 1,000\text{mcg}$$

$$1\text{kg} = 1000\text{g} = 1,000,000\text{mg} = 1,000,000,000\text{mcg}$$

$$1\text{L} = 1,000\text{ml}$$

$$1\text{ cubic centimeter (cc or cm}^3\text{)} = 1\text{mL}$$

$$1\text{m} = 100\text{cm} = 1,000\text{mm}$$

$$1\text{cm} = 10\text{mm or } .01\text{m}$$

$$1\text{mm} = .1\text{cm or } .001\text{m}$$

$$2.54\text{cm} = 1\text{ inch}$$

$$30.5\text{cm} = 1\text{ foot}$$

$$91.4\text{cm} = 1\text{ yard}$$

$$1.61\text{km} = 1\text{ mile}$$

$$1\text{m} = 39.4\text{ inches}$$

$$1\text{m} = 3.28\text{ feet}$$

$$1\text{m} = 1.09\text{ yards}$$

$$28.4\text{g} = 1\text{ ounce}$$

$$454\text{g} = 1\text{ pound}$$

$$1\text{g} = .0352\text{ ounces}$$

$$1\text{g} = .0022\text{ pounds}$$

$$1\text{kg} = 2.2\text{ pounds}$$

$$3.79\text{L} = 1\text{ gallon}$$

$$.946\text{L} = 1\text{ quart}$$

$$1\text{L} = .264\text{ gallons}$$

$$1\text{L} = 1.06\text{ quart}$$

$$5\text{ml} = 1\text{ teaspoon (tsp)}$$

$$60\text{ drops (gtt)} = 1\text{ teaspoon}$$

$$15\text{ml} = 1\text{ tablespoon (Tbsp)}$$

$$240\text{ml} = 1\text{ cup}$$

## Temperature Conversions

Fahrenheit to Celsius

$$C = \frac{(F - 32)}{1.8}$$

Convert 70°F to Celsius

$$C = \frac{(70 - 32)}{1.8} = 21.1^\circ\text{C}$$

Celsius to Fahrenheit

$$F = 1.8C + 32$$

Convert 11°C to F

$$F = (1.8 \times 11) + 32 = 51.8^\circ\text{F}$$