



# Unit Conversion - Worksheet

Unit measurement is very important for Nursing students, especially for drug and dosage calculations. This topic requires prior knowledge about general maths concepts, such as, **Fractions, long division, long multiplication,** and **Decimals** along with the metric system.

Quantity	Unit	Symbol
length	metre	m
mass	gram	g
volume	litre	l

## Example

Measuring length: The tree is 1.6 metre (m) long.

Measuring mass: The pen weighs 10 grams (g).

Measuring volume: You need to drink at least 2litres (L) water a day.

## Unit Conversion

### Length scale:

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Micrometre ( $\mu\text{m}$ )      Millimetre(mm)      Metre(m)      Kilometre(km)

### Mass scale:

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Microgram ( $\mu\text{g}$ )      Milligram(mg)      Gram(g)      Kilogram(kg)

### Volume scale:

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Microliter ( $\mu\text{l}$ )      Millilitre(ml)      Litre(L)      Kilolitre(kl)



## Method

### Changing a smaller unit to a bigger unit:

If you want to change a smaller unit to a bigger unit, (that is going from left to right on the scale), you need to **divide** the smaller unit by the power of 1000 as you go from the next larger (immediately to its right) to the farthest.

$$\begin{aligned}\text{For example: } 1 \text{ micro(unit)} &= \frac{1}{1000} \text{ milli(unit) and} \\ &= \frac{1}{1000 \times 1000} \text{ unit and} \\ &= \frac{1}{1000 \times 1000 \times 1000} \text{ kilo(unit)}\end{aligned}$$

### Changing a bigger unit to a smaller unit:

If you want to change a bigger unit to a smaller unit, (that is going from right to left on the scale), you need to **multiply** the bigger unit by the power of 1000 as you go from the next smaller (immediately to its left) to the farthest.

$$\begin{aligned}\text{For example: } 1 \text{ kilo(unit)} &= (1 \times 1000) \text{ unit and} \\ &= (1 \times 1000 \times 1000) \text{ milli(unit) and} \\ &= (1 \times 1000 \times 1000 \times 1000) \text{ micro(unit)}\end{aligned}$$

### Example

Convert 23570 milligrams to grams and kilograms.

Grams is the next larger unit to milligrams.

So,

$$23570 \text{ milligrams} = \frac{23570}{1000} \text{ grams} = 23.570 \text{ grams}$$

Again, kilogram is at the second smaller position to the right of milligram.

So,

$$23570 \text{ milligrams} = \frac{23570}{1000 \times 1000} \text{ Kilograms} = 0.023570 \text{ kilograms.}$$

**Note:** When you convert a small unit to a bigger unit, the number gets smaller.



Example

Convert 645 kilolitres to litres and microlitres.

Litre is the next smaller unit to kilolitre.

So,

645 kilolitres =  $(645 \times 1000)$  litre = 645,000 litres

Again, microlitre is at the third smaller position to the left of kilolitres.

So,

645,000 litres =  $(645,000 \times 1000 \times 1000)$  = 645,000,000,000 microlitres

**Note:** When you convert a big unit to a smaller unit, the number gets bigger.

Example

Paracetamol comes in 2g tablets. The doctor orders 3000mg of Paracetamol to a patient which comes in 2g tablet sizes. How many tablets would you give to the patient?

Answer:

To solve this question, you need to convert the tablet sizes from grams(g) to milligrams(mg) to be able to calculate how many tablets will provide the prescribed 3000mg to the patient.

As we know already, mg is the next smaller unit to grams and we are converting a big unit to a smaller unit.

2g =  $(2 \times 1000)$  mg = 2000 mg

So, 1 tablet would give 2000mg but the prescription is for 3000mg.

Hence, number of tablets =  $\frac{3000 \text{ mg}}{2000 \text{ mg}} = \frac{3}{2} = 1 \frac{1}{2}$  tablets

So, you need to provide 1 and a half tablets to the patient.



## Practice Exercises

### Question 1:

Convert the units to kilo(units):

No.	Units	Converted to kilo
1	16mg	
2	74ml	
3	450 $\mu$ g	
4	195g	
5	235mm	

### Question 2:

Convert the units to milli(units):

No.	Units	Converted to milli
1	28g	
2	960 $\mu$ l	
3	13 $\mu$ g	
4	296m	
5	39km	

### Question 3:

You have an order for 9mg oral Prednisolone. It comes as a 0.12g in 2mL solution. How many ml(s) equal the dose required?