

Unit Conversion

Using the Factor Label Method

Metric System

Standard Measurement

Prefix	Part
mili-	1/1000
centi-	1/100
deci-	1/10
	1
deca-	x 10
hecto-	x 100
kilo-	x 1000

Length (meters)	
1 mm	0.001 m
1 cm	0.01 m
1 dm	0.1 m
1 meter	1 m
1 dam	10 m
1 hm	100 m
1 km	1000 m

Mass (grams)	
1 mg	0.001 g
1 cg	0.01 g
1 dg	0.1 g
1 gram	1 g
1 dag	10 g
1 hg	100 g
1 kg	1000 g

Volume (liters)	
1 mL	0.001 L
1 cL	0.01 L
1 dL	0.1 L
1 liter	1 L
1 daL	10 L
1 hL	100 L
1 kL	1000 L

Imperial System Useful Equivalents

Length

1 inch	2.54 cm
12 in.	1 foot
1 foot	0.3048 m
3 ft.	1 yard
1 yard	0.9144 m
1,760 yd	1 mile
1 mile	1.6093 km

Mass

1 ounce	28.35 g
16 oz.	1 pound
1 pound	0.4536 kg
14 lb.	1 stone
1 stone	6.3503 kg
1 ton	1.016 t
1 tonne	1,000 kg

Volume

1 ounces	29.574 mL
8 fl. oz.	1 cup
1 cup	250 mL
2 cups	1 pint
1 pint	0.5 L
2 pints	1 gallon
1 gallon	3.7854 L

Sample Problems & Solutions

1. How many millimeters are in 1.25 meters?
 - a. First write down what you are supposed to convert.
 - b. Then write it multiplied by the conversion factor.
 - c. Cancel the original unit crossing it out top & bottom.
 - d. Finish multiplying and write the answer with the appropriate unit.

$$1.25 \text{ meters} \times \frac{1000 \text{ mm}}{\text{m}} = 1250 \text{ mm}$$

Sample Problems & Solutions

2. How many inches are in two and a half feet?
 - a. First write down what you are supposed to convert.
 - b. Then write it multiplied by the conversion factor.
 - c. Cancel the original unit crossing it out top & bottom.
 - d. Finish multiplying and write the answer with the appropriate unit.

$$2.5 \text{ feet} \times \frac{12 \text{ inches}}{\text{ft.}} = 30 \text{ inches}$$

Solve the Following Problems

1. How many kilometers are there in 731 meters?
 - a. First write down what you are supposed to convert.
 - b. Then write it multiplied by the conversion factor.
 - c. Cancel the original unit crossing it out top & bottom.
 - d. Finish multiplying and write the answer with the appropriate unit.

$$731 \text{ meters} \times \frac{\text{kilometer}}{1000 \text{ m}} = 0.731 \text{ km}$$

Solve the Following Problems

2. How many millimeters are there in 273 centimeters?
- First write down what you are supposed to convert.
 - Then write it multiplied by the conversion factor.
 - Cancel the original unit crossing it out top & bottom.
 - Finish multiplying and write the answer with the appropriate unit.

$$273 \text{ cm} \cancel{\text{}} \times \frac{10 \text{ mm}}{1 \text{ cm} \cancel{\text{}}} = 2730 \text{ mm}$$

Solve the Following Problems

3. How many meters are there in 75 feet?
- First write down what you are supposed to convert.
 - Then write it multiplied by the conversion factor.
 - Cancel the original unit crossing it out top & bottom.
 - Finish multiplying and write the answer with the appropriate unit.

$$75 \cancel{\text{ feet}} \times \frac{0.3048 \text{ m}}{1 \cancel{\text{ ft.}}} = 22.86 \text{ m}$$

Solve the Following Problems

4. How many milligrams are there in 2.53 grams?
- First write down what you are supposed to convert.
 - Then write it multiplied by the conversion factor.
 - Cancel the original unit crossing it out top & bottom.
 - Finish multiplying and write the answer with the appropriate unit.

$$2.53 \text{ grams} \times \frac{1000 \text{ mg}}{1 \text{ g}} = 2530 \text{ mg}$$

Solve the Following Problems

5. How many kilograms are there in 2531 grams?
- First write down what you are supposed to convert.
 - Then write it multiplied by the conversion factor.
 - Cancel the original unit crossing it out top & bottom.
 - Finish multiplying and write the answer with the appropriate unit.

$$2531 \text{ ~~grams~~} \times \frac{1 \text{ kilogram}}{1000 \text{ ~~g~~}} = 2.531 \text{ kg}$$

Solve the Following Problems

6. How many pounds are in 14 kilograms?
- First write down what you are supposed to convert.
 - Then write it multiplied by the conversion factor.
 - Cancel the original unit crossing it out top & bottom.
 - Finish multiplying and write the answer with the appropriate unit.

$$14 \text{ kg} \times \frac{1 \text{ lb.}}{0.4536 \text{ kg}} = 30.86 \text{ lb.}$$

Solve the Following Problems

7. How many millimeters in two and a half liters?
- First write down what you are supposed to convert.
 - Then write it multiplied by the conversion factor.
 - Cancel the original unit crossing it out top & bottom.
 - Finish multiplying and write the answer with the appropriate unit.

$$2.5 \cancel{\text{L}} \times \frac{1000 \text{ mL}}{1 \cancel{\text{L}}} = 2500 \text{ mL}$$

Solve the Following Problems

8. If you have 7 fluid ounces, how many mL is that?
- First write down what you are supposed to convert.
 - Then write it multiplied by the conversion factor.
 - Cancel the original unit crossing it out top & bottom.
 - Finish multiplying and write the answer with the appropriate unit.

$$7 \cancel{\text{ fl.oz}} \times \frac{29.574 \text{ mL}}{1 \cancel{\text{ fl.oz}}} = 207.018 \text{ mL}$$

Solve the Following Problems

9. How many meters is 22 yards?
- First write down what you are supposed to convert.
 - Then write it multiplied by the conversion factor.
 - Cancel the original unit crossing it out top & bottom.
 - Finish multiplying and write the answer with the appropriate unit.

$$22 \text{ yd.} \times \frac{0.9144 \text{ m}}{1 \text{ yd.}} = 20.12 \text{ m}$$

Solve the Following Problems

10. How many kilometers in 2 miles?

- First write down what you are supposed to convert.
- Then write it multiplied by the conversion factor.
- Cancel the original unit crossing it out top & bottom.
- Finish multiplying and write the answer with the appropriate unit.

$$2 \cancel{\text{mi.}} \quad \times \quad \frac{1.6093 \text{ km}}{1 \cancel{\text{mi.}}} = 3.2186 \text{ km}$$

Solve the Following Problems

11. If you weigh 140 lb. then how many kilograms is that?
- First write down what you are supposed to convert.
 - Then write it multiplied by the conversion factor.
 - Cancel the original unit crossing it out top & bottom.
 - Finish multiplying and write the answer with the appropriate unit.

$$140 \cancel{\text{ lb.}} \times \frac{0.4536 \text{ kg}}{1 \cancel{\text{ lb.}}} = 63.5 \text{ kg}$$

Solve the Following Problems

12. If there's half a milliliter in one drop of water, how many drops are in 17 mL?

- a. First write down what you are supposed to convert.
- b. Then write it multiplied by the conversion factor.
- c. Cancel the original unit crossing it out top & bottom.
- d. Finish multiplying and write the answer with the appropriate unit.

$$17 \cancel{\text{ mL}} \times \frac{1 \text{ drop water}}{0.5 \cancel{\text{ mL}}} = 34 \text{ drops water}$$

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