

## Dimensional Analysis Introduction

Dimensional analysis is also known as unit conversion, factor analysis, factor label, factor unit system, unit analysis, DA, and unit multipliers. You have a great advantage once you understand dimensional analysis. You only need to know one definition about any new unit you are introduced to in order to use it to convert that unit in any problem. Dimensional analysis is a tool used in obtaining most science math solutions.

### Standard measure

1 foot = 12 inches  
1 yard = 3 feet = 36 inches  
1 mile = 1760 yards = 5280 feet

### Cooking units

3 teaspoons = 1 tablespoon  
1 tablespoon =  
1 cup = 8 fluid ounces  
1 pint = 2 cups  
1 quart = 2 pints  
1 gallon = 4 quarts

### Standard to metric

1 inch = 2.54 centimeters  
1 kilogram = 2.2 lbs  
1 liter = 1.06 quarts  
1 mile = 1.61 kilometers  
1 lb = 454 grams

### Animal equivalencies

15 birds = 1 dog  
6 birds = 1 cat  
1 birds = 4 frogs  
24,000 birds = 1 elephant

### Time

1 minute = 60 seconds  
1 hour = 60 minutes  
1 day = 24 hours  
1 week = 7 days  
1 year = 52 weeks = 365 days

### Standard weight

1 lb = 16 ounces  
1 ton = 2000 lbs

### Time

1 minute = 60 seconds  
1 hour = 60 minutes  
1 day = 24 hours  
1 week = 7 days  
1 year = 52 weeks = 365 days  
1 decade = 10 years  
1 century = 10 decades

### Metric Length

1 meter = 100 centimeters  
1 centimeter = 10 millimeters  
1 kilometer = 1000 meters

## CONVERSION BETWEEN METRIC AND CUSTOMARY

### LENGTH

Metric	Customary
1 millimeter (mm)	0.0394 in
1 centimeter (cm;=10mm)	0.3937 in
1 meter (m; = 100 cm)	1.0936 yd
1 kilometer (km;=1,000m)	0.6214 mile

Customary	Metric
1 inch (in)	2.54 cm
1 foot (ft; - 12 in)	0.3048 m
1 yard (yd; = 3 ft)	0.9144 m
1 mile (=1760 yd)	1.6093 km

### AREA

Metric	Customary
1 cm <sup>2</sup> (=100mm <sup>2</sup> )	0.1550 in <sup>2</sup>
1 m <sup>2</sup> (=10,000 cm <sup>2</sup> )	1.1960 yd <sup>2</sup>
1 hectare (ha; = 10,000m <sup>2</sup> )	2.4722 acres
1 km <sup>2</sup> (= 100 ha)	0.3861 mile <sup>2</sup>

Customary	Metric
1 in <sup>2</sup>	6.4516 cm <sup>2</sup>
1 ft <sup>2</sup> (=144 in <sup>2</sup> )	0.0929 m <sup>2</sup>
1 yd <sup>2</sup> (=9 ft <sup>2</sup> )	0.8361 m <sup>2</sup>
1 acre (=4840 yd <sup>2</sup> )	4046.9 m <sup>2</sup>
1 mile <sup>2</sup> (=640 acres)	2.59 km <sup>2</sup>

### VOLUME/CAPACITY

Metric	Customary
1 cm <sup>3</sup>	0.0610 in <sup>3</sup>
1 dm <sup>3</sup> (=1,000cm <sup>3</sup> )	0.0353 ft <sup>3</sup>
1 m <sup>3</sup> (=1,000 dm <sup>3</sup> )	1.3080 yd <sup>3</sup>
1 liter (L; = 1 dm <sup>3</sup> )	1.76 pt
1 hectoliter (hl; = 100 L)	21.997 gal

Customary	Metric
1 in <sup>3</sup>	16.387 cm <sup>3</sup>
1 ft <sup>3</sup> (=1,728 in <sup>3</sup> )	0.0283 m <sup>3</sup>
1 US fl oz	29.574 ml
1 pint (17 fl oz)	0.4731 L
1 US gallon	3.7854 L

### MASS/WEIGHT

Metric	Customary
1 milligram (mg)	0.0154 grain
1 gram (g; = 1,000 mg)	0.0353 oz
1 kilogram (kg; = 1,000 g)	2.2046 lb
1 tonne (t; = 1,000 kg)	0.9842 ton (T)

Customary	Metric
1 ounce	28.35 g
1 pound	0.4536 kg
1 ton	1,016 t