


English & Metric Systems
Mathematics and Millennials – 6th




Systems of Measurement

The **quickest and most comprehensive** way to learn about various systems of measurement is **actually easy!**

At **Wikipedia** do a search for **Systems of Measurement!**

It presents a comprehensive presentation of systems and provides an **awesome collection of number systems.**



The Metric System

In 1790, **French National Assembly** commissioned French Academy of Science to design a **simple system**

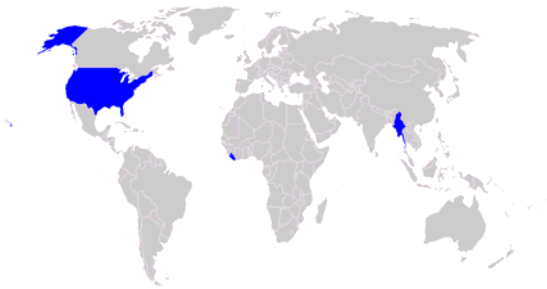
Decimal-based (powers of ten) and very fundamental.

The Metric System is **Système International d'Unités (SI)** and used in **nearly every country except** United States.

The English System

The **English (American)** measurement system was inherited from the **British Empire**. It was based on **many not so simple conversion factors**. This system is **embedded** in our culture **and** seems unchangeable. However, acceptance of the Metric System does exist!

The Metric System



Units of Measure

The Metric System

Length: **Meter**, Mass: **Gram**, Volume: **Liter**, Time: **Second**

Temperature: **Degree - Celsius**, Weight: **Newton**

The English System

Length: **Foot**, Mass: **Slug**, Volume: **Gallon**, Time: **Second**

Temperature: **Degree - Fahrenheit**, Weight: **Pound**

The Metric System

Length (Meter)

milli(10^{-3})meter, centi(10^{-2})meter, deci(10^{-1})meter,

deka(10^1)meter, hecto(10^2)meter, kilo(10^3)meter

... .001 .01 .1 Meter 10 100 1000 ...

The English System

Length (Foot)

Inches (1/12 foot), Foot(Unit), Yard(3 feet),

Rod(16 ½ ft), Furlong(660 ft), Mile(5280 ft)

Conversion from any Unit of Length is not so easy!

US & Metric System - 1

Almost all medicines (pharmaceuticals) in the US are in milligrams (mg) or cubic centimeters (cc).

The Automobile Industry builds most cars using The Metric System for sale & use by other nations.

The US Department of Commerce ships products overseas in Metric Tons or in Kilograms (kg).

US & Metric System - 2

The **Metric System** is prolific within **PC** technology.

Type of **storage** in a PC would use terms such as:

Kilobytes, Megabytes, Gigabytes... (Bits & Bytes)

Types of **communication** (Dial Up, DSL, Broadband)

Kilo-bps, Mega-bps, Giga-bps... (Speed of Bits)

Knowing **and** using **Metrics** is critical in the **Real World!**

Metric System - 1

Common References:

Meter is **close** to a **distance** from the floor to a **door knob**.

Gram is **close** to a **mass** (not weight) of a small **paper clip**.

Liter is **close** to a volume of a **small** plastic bottle of **Coke**.

Degree of Celsius: 0° is **freezing** & 100° is water **boiling**.

Best to learn units of Metric System! **Not** to convert them!

Metric System - 2

Change **verbal** measurement to **numeric** measurement.

25 **millimeters** = ____ meters (25 x **.001** = ____ meters)

8 **centimeters** = .08 meters (8 x **.01** = .08 meters)

347 **decimeters** = ____ meters (347 x **.1** = ____ meters)

69 **dekameters** = ____ meters (69 x **10** = ____ meters)

12 **hectometers** = 1200 meters (12 x **100** = 1200 meters)

7 **kilometers** = 7000 meters (7 x **1000** = 7000 meters)

A conversion factor is **term prefix** to **numeric value!**

Metric System - 3

Change verbal measurement to numeric measurement.

- 5 **milligrams** = .005 grams (5 x **.001** = .005 grams)
380 **centigrams** = ____ grams (380 x **.01** = ____ grams)
82 **decigrams** = 8.2 grams (82 x **.1** = 8.2 grams)
509 **dekagrams** = 5090 grams (509 x **10** = 5090 grams)
6 **hectograms** = ____ grams (6 x **100** = ____ grams)
13 **kilograms** = ____ grams (13 x **1000** = ____ grams)

A conversion factor is **term prefix** to **numeric value**!

Metric System - 4

Change verbal measurement to numeric measurement.

- 7 **milliliter** = .007 liters (7 x **.001** = .007 liters)
600 **centiliter** = ____ liters (600 x **.01** = ____ liters)
82 **deciliter** = 8.2 liters (82 x **.1** = 8.2 liters)
903 **dekaliter** = 9030 liters (903 x **10** = 9030 liters)
8 **hectoliter** = ____ liters (8 x **100** = ____ liters)
94 **kiloliter** = ____ liters (94 x **1000** = ____ liters)

A conversion factor is **term prefix** to **numeric value**!

English System - 1

Common Units:

Units for **Length**: Inches, Feet Yards.

Units for **Weight**: Ounces, Pounds, Tons

Units for **Volume**: Pints, Quarts, Gallons

Degree of Celsius: 32° is freezing & 212° is water boiling.

Common misconception is The English System is easy!

English System - 2

Change provided measurement to another measurement.

43 inches = ____ feet ($43 / 12 = 3.58333\dots$ feet)

274 feet = 3288 inches ($274 \times 12 = 3288$ inches)

6 yards = 216 inches ($6 \times 36 = 216$ inches)

49 inches = ____ yards ($49 / 36 = 1.36111\dots$ yards)

80 yards = 240 feet ($80 \times 3 = 240$ feet)

95 feet = ____ yards ($95 / 3 = 31.666\dots$ yards)

Many different terms and numeric values!

English System - 3

Change provided measurement to another measurement.

85 pints = ____ quarts ($85 / 2 = ___$ quarts)

740 quarts = 1480 pints ($740 \times 2 = 1480$ pints)

17 pints = ____ gallons ($17 / 8 = ___$ gallons)

45 gallons = 360 pints ($45 \times 8 = 360$ pints)

83 gallons = ____ quarts ($83 \times 4 = ___$ quarts)

75 pints = 37.5 quarts ($75 / 2 = 37.5$ quarts)

Not as easy as you thought! Let's keep trying!

English System - 4

Change provided measurement to another measurement.

85 ounces = ____ pounds ($85 / 16 = ___$ pounds)

140 pounds = 2240 ounces ($140 \times 16 = 2240$ ounces)

7400 pounds = ____ tons ($7400 / 2000 = ___$ tons)

45 tons = 90,000 pounds ($45 \times 2000 = 90000$ pounds)

3 tons = ____ ounces ($3 \times 32000 = ___$ ounces)

16×10^6 ounces = 500 tons ($16 \times 10^6 / 32000 = 500$ tons)

The English System has many conversion factors!

