

Basic Metric Flashcards

Revision 4.8

1. The lower-left corner of each card indicates “dual” or “question/answer”:
 - a. “Dual” sided: both sides pose a question answered by the other side. When using for study, mix these up both in order and front-to-back.
 - b. “Answer/Question” have a question on one side, the answer on the other. Do not let these become mixed front-to-back.
2. These are intended for people wanting a basic proficiency with the SI version of the metric system. Learning these cards will *not* adequately prepare you for taking the U.S. Metric Association’s Certified Metrication Specialist exam. However, they will prepare you for general use of the metric system in day-to-day life.
3. If you print these on a duplex printer, be sure to specify binding on the left edge, which is the short edge for these landscape pages. Some printers call this “side binding,” others call it “top binding.”
4. You will find some eccentricities unique to me; feel free to modify or throw away cards you do not like. These fall into two areas:
 - a. Conversions from colloquial units. Some experienced metric instructors eschew memorization of conversions. They believe that it is best to get a “feel” for the size of each unit. While this is no doubt true, the United States is going to be in transition for many years, so I feel that learning some basic conversions is necessary.
 - b. Style. Although metric style is well defined when compared to colloquial style, there are still some areas not specifically addressed by the standards. You will see some of my employer’s in-house style guide in a few cards, such as “spell out integers less than 100 when used with unit names.”
5. These are NOT copyrighted in any way. You may reproduce, print, copy, distribute, and even sell them as you desire, with no attribution to me.

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Useful Metric Web Pages

<http://www.metric.org>

U. S. Metric Association, premier advocate of metrication in the USA, a non-profit institution

<http://www.metric1.org>

SI Navigator™, a web site offering a wealth of metric information and links to other metric web sites

<http://www.metricmethods.com>

Metrication consultation services, including training and other services for metricating your business.

<http://physics.nist.gov/Pubs/SP811/contents.html>

Publication SP811, from the National Institute of Standards and Technology. You can download this PDF file for free, and have a definitive reference for the use of metric in the United States.

**What number does this
prefix and symbol represent:**

giga G

Dual

USMA: www.metric.org

**What number does this
prefix and symbol represent:**

mega M

Dual

USMA: www.metric.org

**What number does this
prefix and symbol represent:**

kilo k

Dual

USMA: www.metric.org

**What number does this
prefix and symbol represent:**

hecto h

Dual

USMA: www.metric.org

**What number does this
prefix and symbol represent:**

deka da

Dual

USMA: www.metric.org

**What number does this
prefix and symbol represent:**

deci d

Dual

USMA: www.metric.org

**What number does this
prefix and symbol represent:**

centi c

Dual

USMA: www.metric.org

**What number does this
prefix and symbol represent:**

milli m

Dual

USMA: www.metric.org

**What is the name and symbol
for the SI unit of:**

volume (small)

Dual

USMA: www.metric.org

**What is the name and symbol
for the prefix meaning:**

**1 000
or thousand**

Dual

USMA: www.metric.org

**What is the name and symbol
for the prefix meaning:**

**1 000 000
or million**

Dual

USMA: www.metric.org

**What is the name and symbol
for the prefix meaning:**

**1 000 000 000
or billion**

Dual

USMA: www.metric.org

**What is the name and symbol
for the prefix meaning:**

**0.1 or 1/10th
or tenth**

Dual

USMA: www.metric.org

**What is the name and symbol
for the prefix meaning:**

**10
or ten**

Dual

USMA: www.metric.org

**What is the name and symbol
for the prefix meaning:**

**100
or hundred**

Dual

USMA: www.metric.org

**What is this unit
used to measure:**

milliliter mL

Dual

USMA: www.metric.org

**What is the name and symbol
for the prefix meaning:**

**0.001 or 1/1000th
or thousandth**

Dual

USMA: www.metric.org

**What is the name and symbol
for the prefix meaning:**

**0.01 or 1/100th
or hundredth**

Dual

USMA: www.metric.org

**What is the name and symbol
for the SI unit of:**

temperature

Dual

USMA: www.metric.org

**What is the name and symbol
for the SI unit of:**

energy

Dual

USMA: www.metric.org

**What is the name and symbol
for the SI unit of:**

mass

Dual

USMA: www.metric.org

**What is the name and symbol
for the SI unit of:**

length

Dual

USMA: www.metric.org

**What is the name and symbol
for the SI unit of:**

time

Dual

USMA: www.metric.org

**What is the name and symbol
for the SI unit of:**

force

Dual

USMA: www.metric.org

**What is the name and symbol
for the SI unit of:**

pressure

Dual

USMA: www.metric.org

**What is the name and symbol
for the SI unit of:**

power

Dual

USMA: www.metric.org

**What is the name and symbol
for the SI unit of:**

volume (technical)

Dual

USMA: www.metric.org

**What is this unit
used to measure:**

kilogram kg

Dual

USMA: www.metric.org

**What is this unit
used to measure:**

joule J

Dual

USMA: www.metric.org

**What is this unit
used to measure:**

degree Celsius °C

Dual

USMA: www.metric.org

**What is this unit
used to measure:**

newton N

Dual

USMA: www.metric.org

**What is this unit
used to measure:**

second s

Dual

USMA: www.metric.org

**What is this unit
used to measure:**

meter m

Dual

USMA: www.metric.org

**What is this unit
used to measure:**

cubic meter m³

Dual

USMA: www.metric.org

**What is this unit
used to measure:**

watt W

Dual

USMA: www.metric.org

**What is this unit
used to measure:**

pascal Pa

Dual

USMA: www.metric.org

**What is the name and symbol
for the SI unit of:**

speed (common)

Dual

USMA: www.metric.org

**What is the name and symbol
for the SI unit of:**

speed (technical)

Dual

USMA: www.metric.org

**What is the name and symbol
for the SI unit of:**

area (technical)

Dual

USMA: www.metric.org

**What is the name and symbol
for the SI unit of:**

area (large)

Dual

USMA: www.metric.org

**What is the names and symbols
for the units of measures for:**

mass (large)

Dual

USMA: www.metric.org

**What are the names and symbols
for the unit of measures for:**

time (common)

Dual

USMA: www.metric.org

**What is the name and symbol
for the SI unit of:**

volume (common)

Dual

USMA: www.metric.org

**What is the name and symbol
for the SI unit of:**

length or distance (large)

Dual

USMA: www.metric.org

**What is the name and symbol
for the SI unit of:**

length (small)

Dual

USMA: www.metric.org

**What is this unit
used to measure:**

square meter m²

Dual

USMA: www.metric.org

**What is this unit
used to measure:**

meter per second m/s

Dual

USMA: www.metric.org

**What is this unit
used to measure:**

kilometer per hour km/h

Dual

USMA: www.metric.org

**What are these units
used to measure:**

**hour, minute second
h, min, s**

Dual

USMA: www.metric.org

**What is this unit
used to measure:**

**metric ton or tonne
or megagram Mg**

Dual

USMA: www.metric.org

**What is this unit
used to measure:**

hectare ha

Dual

USMA: www.metric.org

**What is this unit
used to measure:**

millimeter mm

Dual

USMA: www.metric.org

**What is this unit
used to measure:**

kilometer km

Dual

USMA: www.metric.org

**What is this unit
used to measure:**

liter L

Dual

USMA: www.metric.org

**What are we measuring, and
what is the conversion from:**

**inches
to
millimeters?**

Question

USMA: www.metric.org

**What are we measuring, and
what is the conversion from:**

**feet
to
meters?**

Question

USMA: www.metric.org

**What are we measuring, and
what is the conversion from:**

**cups
to
liters?**

Question

USMA: www.metric.org

**What are we measuring, and
what is the conversion from:**

**miles
to
kilometers?**

Question

USMA: www.metric.org

**What are we measuring, and
what is the conversion from:**

**quarts
to
liters?**

Question

USMA: www.metric.org

**What are we measuring, and
what is the conversion from:**

**ounces
to
grams?**

Question

USMA: www.metric.org

**Estimate the diameter of a:
marble
golf ball
baseball
basketball**

Question

USMA: www.metric.org

**What are we measuring, and
what is the conversion from:**

**teaspoons
to
milliliters?**

Question

USMA: www.metric.org

**What are we measuring, and
what is the conversion from:**

**pounds
to
kilograms?**

Question

USMA: www.metric.org

Measuring: volume

cups / 4 → liters (L)
(approximate conversion)

Answer

USMA: www.metric.org

Measuring: length or distance

feet / 3 → meters (m)
(approximate conversion)

Answer

USMA: www.metric.org

Measuring: length or distance

inches × 25 → millimeters (mm)
(approximate conversion)

Answer

USMA: www.metric.org

Measuring: mass

ounces × 28 → grams (g)
(approximate conversion)

Answer

USMA: www.metric.org

Measuring: volume

quarts × 1 → liters (L)
or quarts = liters (L)
(approximate conversion)

Answer

USMA: www.metric.org

Measuring: length or distance

miles × 1.6 → kilometers (km)
(approximate conversion)

Answer

USMA: www.metric.org

Measuring: mass

pounds / 2.2 → kilograms (kg)
(approximate conversion)

Answer

USMA: www.metric.org

Measuring: volume

teaspoons × 5 →
milliliters (mL)

Answer

USMA: www.metric.org

marble: 10 mm
golf ball: 40 mm
baseball: 70 mm
basketball: 300 mm

Answer

USMA: www.metric.org

**What are we measuring, and
what is the conversion from:**

**calories (food)
to
kilojoules?**

Question

USMA: www.metric.org

**What are we measuring, and
what is the conversion from:**

**degrees Fahrenheit
to
degrees Celsius?**

Question

USMA: www.metric.org

**Estimate the mass of a:
nickel
tennis shoe
hardback book
dining room chair**

Question

USMA: www.metric.org

**What are we measuring, and
what is the conversion from:**

**miles per hour
to
kilometers per hour?**

Question

USMA: www.metric.org

**Converting from a
larger to a smaller
unit makes the number
larger or smaller?**

Question

USMA: www.metric.org

**What are we measuring, and what
are the conversion between:**

**liters
to/from
cubic meters?**

Question

USMA: www.metric.org

**Converting from a
smaller to a larger
unit makes the number
larger or smaller?**

Question

USMA: www.metric.org

**What are we measuring, and what
are the conversions between:**

**millimeters to/from
centimeters to/from
meters to/from
kilometers?**

Question

USMA: www.metric.org

**What are we measuring, and what
are the conversions between:**

**metric tons to/from
tonnes to/from
megagrams?**

Question

USMA: www.metric.org

nickel: 5 g
tennis shoe: 200 g
hardback book: 800 g
chair: 3 kg

Answer

USMA: www.metric.org

Measuring: temperature

$(^{\circ}\text{F} - 32) \times 5 / 9 \rightarrow ^{\circ}\text{C}$
(exact conversion)

Answer

USMA: www.metric.org

Measuring: energy

calories (food) $\times 4 \rightarrow$
kilojoules (kJ)
(approximate conversion)

Answer

USMA: www.metric.org

Measuring: volume

liters / 1 000 \rightarrow m³
m³ \times 1 000 \rightarrow liters (L)
(exact conversion)

Answer

USMA: www.metric.org

Larger

Answer

USMA: www.metric.org

Measuring: speed

MPH $\times 1.6 \rightarrow$
kilometers per hour (km/h)
(approximate conversion)

Answer

USMA: www.metric.org

Measuring: mass

metric ton = tonne = megagram

Answer

USMA: www.metric.org

Measuring: length or distance

kilometer \times 1 000 \rightarrow meter
meter \times 100 \rightarrow centimeter
meter \times 1 000 \rightarrow millimeter
centimeter \times 10 \rightarrow millimeter

Answer

USMA: www.metric.org

Smaller

Answer

USMA: www.metric.org

What are we measuring, and what are the conversions between:

square meters to/from hectares to/from square kilometers?

Question

USMA: www.metric.org

How is area shown with a symbol?

With a name?

Question

USMA: www.metric.org

How is volume shown with a symbol?

With a name?

Question

USMA: www.metric.org

What is the capitalization rule for names?

For symbols?

Question

USMA: www.metric.org

Describe the difference between a “name” and a “symbol”?

Question

USMA: www.metric.org

When do you show a number as a fraction, such as $\frac{1}{2}$ or $\frac{3}{8}$?

Question

USMA: www.metric.org

How do we group digits in a long number in the metric system?

Question

USMA: www.metric.org

When are periods used with names?

With symbols?

Question

USMA: www.metric.org

When do you make a symbol plural?

A name?

Question

USMA: www.metric.org

With symbols use superscript 3:

m^3, mm^3

**With names use "cubic":
cubic meter, cubic millimeter**

Answer

USMA: www.metric.org

With symbols use superscript 2:

m^2, mm^2

**With names use "square":
square meter, square millimeter**

Answer

USMA: www.metric.org

Measuring: area

square kilometer $\times 100 \rightarrow$ hectare

hectare $\times 10\,000 \rightarrow$ square meter

$km^2 \times 1\,000\,000 \rightarrow m^2$

(exact conversions)

Answer

USMA: www.metric.org

**Never use fractions in the
metric system.**

Answer

USMA: www.metric.org

**Name: when the unit of
measure is spelled out.**

**Symbol: when the unit of measure is
is represented by a few letters
(its symbol).**

Answer

USMA: www.metric.org

**Names: capitalize at the start of
sentences, except always capitalize
Celsius.**

**Symbols: always use the
prescribed case; no exceptions.**

Answer

USMA: www.metric.org

**Symbols: never make a unit
symbol plural.**

**Names: when the associated number
is greater than one (> 1).**

Answer

USMA: www.metric.org

**For both names and symbols
use a period only at the end
of a sentence.**

Answer

USMA: www.metric.org

**Group five or more digits into
groups of three with a space:**

12 235.678 901

1234.567 89

Answer

USMA: www.metric.org

What four prefixes should not be used in technical work?

Question

USMA: www.metric.org

With compound units, where do you add a necessary prefix?

Question

USMA: www.metric.org

How do you select which prefix to use?

Question

USMA: www.metric.org

How do you show a product (multiplication) with a unit name?

A symbol?

Question

USMA: www.metric.org

How do you show a quotient (division) with a unit symbol?

A name?

Question

USMA: www.metric.org

What is the rule for spaces between a number and its unit name?

Its symbol?

Question

USMA: www.metric.org

When do you spell out a number used with a unit name?

Used with a symbol?

Question

USMA: www.metric.org

What three units of measure should not be used in technical work?

Question

USMA: www.metric.org

What does the symbol "SI" represent?

Question

USMA: www.metric.org

Select a prefix to keep the number ≥ 0.1 and < 1000 .

(Not necessary in intermediate calculations, and sometimes ignored in non-technical work.)

Answer

USMA: www.metric.org

Add the prefix to the first unit name or symbol.

(Except kilogram (kg) can appear after the first name or symbol.)

Answer

USMA: www.metric.org

hecto (100)	h
deka (10)	da
deci (0.1)	d
centi (0.01)	c

Answer

USMA: www.metric.org

**For both names and symbols:
one space between the number
and the name or symbol:
27 mm, 18 °C**

Answer

USMA: www.metric.org

**Symbols: use a solidus (slash):
m/s**

**Names: use "per":
meter per second**

Answer

USMA: www.metric.org

**Names: use a hyphen or space:
newton-meter**

**Symbols: use a raised dot or space:
N • m**

Answer

USMA: www.metric.org

The symbol for the modern metric system, from the French *Système International d'Unités*, (International System of Units)

Answer

USMA: www.metric.org

**hectare (use m^2 or km^2)
kilometer per hour (use m/s)
metric ton or tonne (use Mg)**

Answer

USMA: www.metric.org

**Names: integers < 100
(integer means no fractional part)**

Symbols: never

Answer

USMA: www.metric.org