THE METRIC SYSTEM

NAME	POWER	PREFIX	ABBREV.	FACTOR
Septillion	24	Yotta	Y	1,000,000,000,000,000,000,000,000
Sextillion	21	Zetta	Z	1,000,000,000,000,000,000,000
Quintillion	18	Exa	E	1,000,000,000,000,000,000
Quadrillion	15	Peta	P	1,000,000,000,000,000
Trillion	12	Tera	T	1,000,000,000,000
Billion	9	Giga	G	1,000,000,000
Million	6	Mega	M	1,000,000
10 Thou	4	Myria		10,000
Thousand	3	Kilo	K	1,000
Hundred	2	Hecto	h	100
Ten	1	Deka	dk	10
One	0	None		1
Tenth	-1	Deci	d	.1
Hundredth	-2	Centi	c	.01
Thousandth	-3	Milli	m	.001
Millionth	-6	Micro	μ	.000001
Billionth	-9	Nano	n	.000000001
Trillionth	-12	Pico	p	.000000000001
Quadrillionth	-15	Femto	f	.000000000000001
Quintillionth	-18	Atto	a	.000000000000000001
Sextillionth	-21	Zepto	z	.000000000000000000001
Septillionth	-24	Yocto	y	.000000000000000000000001

IMPORTANT FORMULAS

Area of a circle $A = \pi r^2$ Circumference $C = 2\pi r$

Volume of sphere $V = (4/3)\pi r^3$ Surface area $A = 4\pi r^2$

Rate • Time = Distance (RTD)   Pythagorean $a^2 + b^2 = c^2$

Density = Mass / Volume (DMV)   Force = mass • acceleration ($F = ma$)

Area of rectangle $A = lw$ Area of triangle $A = (1/2)bh$

Boyle's Law $PV = k$ or $P_1 V_1 = P_2 V_2$ Charles' Law $V = kT$ or $V_1/T_1 = V_2/T_2$

Ideal Gas Law $PV = nRT$ $\ln x = \log_e x = 2.303 \log_{10} x$

Average velocity = change in displacement / change in time ($v = \Delta x/\Delta t$)

Average acceleration = change in velocity / change in time ($a = \Delta v/\Delta t$)

Kinetic energy $E_k = (1/2)mv^2$ Power = energy / time ($P = E/t$)

Grav. potential energy $E_p = mgh$ Energy = matter ($E = mc^2$)

$x(t) = 1/2\, at^2 + v_0 t + x_0$ $v_f^2 - v_0^2 = 2ax$ $v_f = v_0 + at$

$F_G = Gm_1 m_2/d^2$ $F_q = kq_1 q_2/d^2$

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WHAT WE MEASURE	SI UNIT	ABBREV.	OTHER UNITS USED
LENGTH	meter	m	Å, light yr, parsec, A.U.
VOLUME	liter	L	quart, gallon
MASS	kilogram	kg	slug
TIME	second	s	
PRESSURE	pascal	Pa	atm, torr, psi, mmHg, N/m^2
TEMPERATURE	°Kelvin	K	°C and °F
FORCE	newton	N	pound, dyne
ENERGY	joule	J	calorie, erg, eV, kwh
WORK	joule	J	British thermal unit
HEAT	joule	J	BTU
POWER	watt	W	horsepower
FREQUENCY	hertz	Hz	cycles per second
AMOUNT OF SUBSTANCE	mole	mol	atomic mass unit
PLANE ANGLE	radian	rad	degree
SOLID ANGLE	steradian	sr	
ELECTRIC CURRENT	ampere	A	C/s; current = i
ELECTRIC CHARGE	coulomb	C	A•s; charge = q
VOLTAGE, EMF	volt	V	W/A
RESISTANCE	ohm	Ω	V/A
CONDUCTANCE	siemens	S	1/Ω
CAPACITANCE	farad	F	C/V
INDUCTANCE	henry	H	Wb/A
MAGNETIC FLUX	weber	Wb	maxwell; V•s
MAGNETIC FIELD	tesla	T	gauss
LIGHT INTENSITY	candela	cd	(lumen = cd•sr) => flux

COMMON UNIT CONVERSIONS

1 meter = 39.37 inches
1 mile = 1609.44 m
1 km = .621 mile
1 inch = 2.54 cm = 25.4 mm
1 liter = 1.057 quarts = 1000 cc
1 gallon = 3.785 L
1 ounce = 28.35 grams
1 pound = 453.6 grams
1 kilogram = 2.205 pounds
1 radian = 57.3 degrees
1 pound = 4.448 N
1 calorie = 4.186 J
1 joule = 10^8 ergs = 6.242×10^{18} eV

1 atm = 10132.5 Pa = 1.013 kPa
1 atm = 760 mmHg = 760 torr = 14.7 psi
1 angstrom = 10^{-10} m = 10^{-8} cm
°F = (9/5)°C + 32°
°C = (5/9)(°F – 32°)
K = °C + 273.15°

1 Newton = 10^5 dynes
1 light year = 5,880,000,000,000 miles
1 horsepower = 550 ft•lb/s = 745.7 W
1 electron volt (eV) = 1.602^{-19} J
60 mi/hr = 88 ft/sec = 26.8 m/s

IMPORTANT NUMBERS AND CONSTANTS

Speed of light in vacuum $c = 3.00 \times 10^8$ m/s

Speed of sound (20°C, 1 atm) = 343 m/s = 1125 ft/s = Mach 1 = 767 mph

Elementary charge $e = 1.60 \times 10^{-19}$ C

Coulomb constant $k = 1/4\pi\varepsilon_0 = 9.0 \times 10^9$ N•m^2/C^2

Mass of an electron $m_e = 9.11 \times 10^{-31}$ kg = .511 MeV

Mass of an proton $m_p = 1.673 \times 10^{-27}$ kg = 938.3 MeV

Mass of an neutron $m_n = 1.675 \times 10^{-27}$ kg = 939.6 MeV

Atomic mass unit $u = 1.66 \times 10^{-27}$ kg = 931.5 MeV

Planck's constant $h = 6.626 \times 10^{-34}$ J/Hz

Avogadro's number $N_A = 6.022 \times 10^{23}$ particles/mole

Universal gas constant $R = .0821$ L•atm/mol•K = 8.314 J/mol•K

Faraday constant $\mathcal{F} = 96494$ C/mol e$^-$ = 96494 J/V

Molar volume of an ideal gas at STP   22.4 liters/mole

Gravitational constant $G = 6.673 \times 10^{-11}$ m^3 / kg•s^2

Acceleration due to gravity $g = 9.80$ m/s^2

Mass of the earth 5.98×10^{24} kg

Mass of the sun 1.99×10^{30} kg

Mass of the moon 7.36×10^{22} kg

Astronomical unit 1.50×10^{11} m

$\pi = 3.14159265358979323384626433...$
$e = 2.718281828...$

Square root of 2 = 1.414
Square root of 2 = 1.732

The Greek Alphabet

Alpha	A	α	Iota	I	ι	Rho	P	ρ
Beta	B	β	Kappa	K	κ	Sigma	Σ	σ
Gamma	Γ	γ	Lambda	Λ	λ	Tau	T	τ
Delta	Δ	δ	Mu	M	μ	Upsilon	Y	υ
Epsilon	E	ε	Nu	N	ν	Phi	Φ	ϕ
Zeta	Z	ζ	Xi	Ξ	ξ	Chi	X	χ
Eta	H	η	Omicron	O	o	Psi	Ψ	ψ
Theta	Θ	θ	Pi	Π	π	Omega	Ω	ω