CONVERSION FACTORS

LENGTH
* 1 in = 2.54 cm
* 1 ft = 12 in = 30.48 cm
  1 m = 1.0936 yd = 3.281 = 39.37 in
* 1 mi = 5280 ft = 1760 yd
  1 mi = 1.609 km
  1 light-year = 9.461×10^{15} m
* 1 Å = 10^{-10} m

VOLUME
  1 L = 1000 cm^3
  1 L = 10^{-3} m^3
  1 L = 3.531×10^{-2} ft^3
  1 gal (U.S.) = 3.786 L

TIME
* 1 h = 60 min = 3600 s
* 1 d = 24 h = 1440 min = 86400 s
  1 yr = 365.2425 d = 3.156×10^7 s

ANGLE
* π rad = 180°
  1 rad = 57.30°
  1° = 1.745×10^{-2} rad

MAGNETIC INDUCTION
* 1 T = 10^4 G

MASS
* 1 kg = 10^3 g
  1 slug = 14.59 kg
  1 kg = 6.852×10^{-2} slug
  1 kg = 6.022×10^{26} u
  1 u = 1.66057×10^{-27} kg

FORCE
  1 lb = 4.4482 N
  1 N = 0.2248 lb = 10^5 dyne

PRESSURE
* 1 atm = 1.01325 bar
* 1 atm = 1.01325×10^5 Pa
* 1 atm = 760 torr

ENERGY
  1 ft-lb = 1.356 J = 3.766×10^{-7} KW-h
  = 1.286×10^{-3} Btu
* 1 cal = 4.1840 J
  1 Btu = 778 ft-lb = 252 cal = 1054 J
  1 eV = 1.602×10^{-19} J

POWER
  1 horsepower = 550 ft-lb/s = 745.7 W
  1 W = 1.341×10^{-3} horsepower
  = 0.7376 ft-lb/s

Thermal Properties of Common Materials

Material	Coefficient of Linear Expansion (per K)	Specific Heat (cal/g•K)	Melting Point (Celsius)	Boiling Point (Celsius)	Heat of Fusion (cal/g)	Heat of Vaporization (cal/g)
Aluminum	2.4×10^{-05}	0.21	660.2	2467	95.3	2520
Brass	1.9×10^{-05}	----	≈1000	----	----	----
Copper	1.7×10^{-05}	0.094	1083	2595	48.9	1146
Iron (steel)	1.2×10^{-05}	0.107	1535	3000	69.12	1515
Lead	3.0×10^{-05}	0.031	327.5	1744	5.9	218
Silver	2.0×10^{-05}	0.056	960.8	2212	21.0	558
Ice	5.1×10^{-05}	0.50	0.000	100.0	80.0	540
Mercury	----	0.033	-38.87	356.58	2.8	65
Water	----	1.00	0.000	100.0	80.0	540

Indices of Refraction			
air	1.0003	water	1.33
polyethylene	1.50	carbon disulfide	1.63
flint glass	1.66	diamond	2.42

PHYSICAL CONSTANTS

Quantity	Symbol	Value	SI Unit
Speed of sound in dry air at 0.0 °C		331	m/s
Speed of light in a vacuum	c	2.99792458×10^{8}	m/s
Permittivity of free space	ε_0	8.85×10^{-12}	F/m
Coulomb's Law constant, $(1/4\pi\varepsilon_0)$	k	8.98755×10^{9}	$N \cdot m^2/C^2$
Permeability of free space	μ_0	1.26×10^{-6}	H/m
Exact value		$4\pi \times 10^{-7}$	H/m
Elementary charge	e	1.60×10^{-19}	C
Plank's constant	h	6.63×10^{-34}	J•s
Electron rest mass	m_e	9.11×10^{-31}	kg
Proton rest mass	m_p	1.67265×10^{-27}	kg
Neutron rest mass	m_n	1.67495×10^{-27}	kg
Electron charge to mass ratio	e/m_0	1.76×10^{11}	C/kg
Avogadro's number	N_A	6.023×10^{23}	mol^{-1}
Molar gas constant	**R**	8.31	J/(mol•K)
Boltzman constant	**k**	1.38×10^{-23}	J/K
Stefan-Boltzman constant	σ	5.67×10^{-8}	$W/(m^2 \cdot K^4)$
Faraday constant	**F**	9.65×10^{4}	C/mol
Molar volume of ideal gas at STP	$\mathbf{V}_m$	22.4	L/mol
Rydberg constant	R	1.10×10^{7}	m^{-1}
Bohr radius	a_0	5.29×10^{-11}	m
Electron Compton wavelength	λ_c	2.43×10^{-12}	m
Gravitational constant	**G**	6.67408×10^{-11}	$N \cdot m^2/kg^2$
Gravitational acceleration on Earth	g	9.80665	m/s^2
Sound intensity at the threshold of hearing	I_0	1.00×10^{-12}	w/m^2

DIMENSIONS

Speed (v)	L/T	Power (P)	E/T
Acceleration (a)	L/T^2	Pressure (p)	F/L^2
Force (F)	ML/T^2	Density (ρ)	M/L^3
Energy (E)	ML^2/T^2	Momentum (**p**)	ML/T

Solar, Terrestrial and Planetary Data

Object	Mass, kg	Radius, m	Escape Speed, m/s	Orbit Radius, m	Orbit Period, yr
Sun	1.99×10^{30}	6.96×10^{8}	--	--	--
Earth	5.98×10^{24}	6.37×10^{6}	1.12×10^{4}	1.5×10^{11}	1.00
Moon	7.35×10^{22}	1.74×10^{6}	2.4×10^{3}	3.84×10^{8}	27.3 days
Mercury	3.3×10^{23}	2.43×10^{6}	4.2×10^{3}	5.8×10^{10}	0.241
Venus	4.87×10^{24}	6.05×10^{6}	1.03×10^{4}	1.08×10^{11}	0.615
Mars	6.4×10^{23}	3.39×10^{6}	5.1×10^{3}	2.28×10^{11}	1.88
Jupiter	1.90×10^{27}	6.87×10^{7}	6.1×10^{4}	7.78×10^{11}	11.86
Saturn	5.69×10^{26}	5.76×10^{7}	3.6×10^{4}	1.43×10^{12}	29.46
Uranus	8.7×10^{25}	2.51×10^{7}	2.2×10^{4}	2.87×10^{12}	84.01
Neptune	1.03×10^{26}	2.47×10^{7}	2.3×10^{4}	4.50×10^{12}	164.8
Pluto	1.31×10^{22}	1.195×10^{6}	1.2×10^{-3}	5.90×10^{12}	248.4