

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 cm³
- 1 L = 10^{-3} m³
- 1 L = 3.531×10^{-2} ft³
- 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^{-5}	0.21	660.2	2467	95.3	2520
Brass	1.9×10^{-5}	----	≈1000	----	----	----
Copper	1.7×10^{-5}	0.094	1083	2595	48.9	1146
Iron (steel)	1.2×10^{-5}	0.107	1535	3000	69.12	1515
Lead	3.0×10^{-5}	0.031	327.5	1744	5.9	218
Silver	2.0×10^{-5}	0.056	960.8	2212	21.0	558
Ice	5.1×10^{-5}	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 -----	3.00×10^8	m/s
Permittivity of free space-----	ϵ_0 -----	8.85×10^{-12}	F/m
Coulomb's Law constant, $(1/4\pi\epsilon_0)$ -----	k -----	9.0×10^9	$\text{N}\cdot\text{m}^2/\text{C}^2$
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 •K ⁴)
Faraday constant-----	F -----	9.65×10^4	C/mol
Molar volume of ideal gas at STP-----	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 -----	6.67×10^{-11}	$\text{N}\cdot\text{m}^2/\text{kg}^2$
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	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