

## CONVERSION FACTORS

Mass	$1 \text{ kg} = 10^3 \text{ g}$ $1 \text{ g} = 10^{-3} \text{ kg}$ $1 \text{ u} = 1.66 \times 10^{-24} \text{ g} = 1.66 \times 10^{-27} \text{ kg}$ $1 \text{ slug} = 14.6 \text{ kg}$ $1 \text{ metric ton} = 1000 \text{ kg}$	Force	$1 \text{ N} = 0.225 \text{ lb}$ $1 \text{ lb} = 4.45 \text{ N}$ Equivalent weight of a mass of 1 kg on Earth's surface = 2.2 lb = 9.8 N $1 \text{ dyne} = 10^{-5} \text{ N} = 2.25 \times 10^{-6} \text{ lb}$
Length	$1 \text{ \AA} = 10^{-10} \text{ m}$ $1 \text{ nm} = 10^{-9} \text{ m}$ $1 \text{ cm} = 10^{-2} \text{ m} = 0.394 \text{ in.}$ $1 \text{ yd} = 3 \text{ ft}$ $1 \text{ m} = 10^{-3} \text{ km} = 3.281 \text{ ft} = 39.4 \text{ in.}$ $1 \text{ km} = 10^3 \text{ m} = 0.621 \text{ mi}$ $1 \text{ in.} = 2.54 \text{ cm} = 2.54 \times 10^{-2} \text{ m}$ $1 \text{ ft} = 0.305 \text{ m} = 30.5 \text{ cm}$ $1 \text{ mi} = 5280 \text{ ft} = 1609 \text{ m} = 1.609 \text{ km}$ $1 \text{ ly (light year)} = 9.46 \times 10^{12} \text{ km}$ $1 \text{ pc (parsec)} = 3.09 \times 10^{13} \text{ km}$	Pressure	$1 \text{ Pa} = 1 \text{ N/m}^2 = 1.45 \times 10^{-4} \text{ lb/in.}^2$ $= 7.5 \times 10^{-3} \text{ mm Hg}$ $1 \text{ mm Hg} = 133 \text{ Pa}$ $= 0.02 \text{ lb/in.}^2 = 1 \text{ torr}$ $1 \text{ atm} = 14.7 \text{ lb/in.}^2 = 101.3 \text{ kPa}$ $= 30 \text{ in. Hg} = 760 \text{ mm Hg}$ $1 \text{ lb/in.}^2 = 6.89 \text{ kPa}$ $1 \text{ bar} = 10^5 \text{ Pa} = 100 \text{ kPa}$ $1 \text{ millibar} = 10^2 \text{ Pa}$
Area	$1 \text{ cm}^2 = 10^{-4} \text{ m}^2 = 0.1550 \text{ in.}^2$ $= 1.08 \times 10^{-3} \text{ ft}^2$ $1 \text{ m}^2 = 10^4 \text{ cm}^2 = 10.76 \text{ ft}^2 = 1550 \text{ in.}^2$ $1 \text{ in.}^2 = 6.94 \times 10^{-3} \text{ ft}^2 = 6.45 \text{ cm}^2$ $= 6.45 \times 10^{-4} \text{ m}^2$ $1 \text{ ft}^2 = 144 \text{ in.}^2 = 9.29 \times 10^{-2} \text{ m}^2 = 929 \text{ cm}^2$	Energy	$1 \text{ J} = 0.738 \text{ ft} \cdot \text{lb} = 0.239 \text{ cal}$ $= 9.48 \times 10^{-4} \text{ Btu} = 6.24 \times 10^{18} \text{ eV}$ $1 \text{ kcal} = 4186 \text{ J} = 3.968 \text{ Btu}$ $1 \text{ Btu} = 1055 \text{ J} = 778 \text{ ft} \cdot \text{lb} = 0.252 \text{ kcal}$ $1 \text{ cal} = 4.186 \text{ J} = 3.97 \times 10^{-3} \text{ Btu}$ $= 3.09 \text{ ft} \cdot \text{lb}$ $1 \text{ ft} \cdot \text{lb} = 1.36 \text{ J} = 1.29 \times 10^{-3} \text{ Btu}$ $1 \text{ eV} = 1.60 \times 10^{-19} \text{ J}$ $1 \text{ kWh} = 3.6 \times 10^6 \text{ J}$ $1 \text{ erg} = 10^{-7} \text{ J} = 7.38 \times 10^{-6} \text{ ft} \cdot \text{lb}$
Volume	$1 \text{ cm}^3 = 10^{-6} \text{ m}^3 = 3.35 \times 10^{-5} \text{ ft}^3$ $= 6.10 \times 10^{-2} \text{ in.}^3$ $1 \text{ m}^3 = 10^6 \text{ cm}^3 = 10^3 \text{ L} = 35.3 \text{ ft}^3$ $= 6.10 \times 10^4 \text{ in.}^3 = 264 \text{ gal}$ $1 \text{ liter} = 10^3 \text{ cm}^3 = 10^{-3} \text{ m}^3 = 1.056 \text{ qt}$ $= 0.264 \text{ gal}$ $1 \text{ in.}^3 = 5.79 \times 10^{-4} \text{ ft}^3 = 16.4 \text{ cm}^3$ $= 1.64 \times 10^{-5} \text{ m}^3$ $1 \text{ ft}^3 = 1728 \text{ in.}^3 = 7.48 \text{ gal} = 0.0283 \text{ m}^3$ $= 28.3 \text{ L}$ $1 \text{ qt} = 2 \text{ pt} = 946 \text{ cm}^3 = 0.946 \text{ L}$ $1 \text{ gal} = 4 \text{ qt} = 231 \text{ in.}^3 = 0.134 \text{ ft}^3 = 3.785 \text{ L}$	Power	$1 \text{ W} = 1 \text{ J/s} = 0.738 \text{ ft} \cdot \text{lb/s}$ $= 1.34 \times 10^{-3} \text{ hp} = 3.41 \text{ Btu/h}$ $1 \text{ ft} \cdot \text{lb/s} = 1.36 \text{ W} = 1.82 \times 10^{-3} \text{ hp}$ $1 \text{ hp} = 550 \text{ ft} \cdot \text{lb/s} = 745.7 \text{ W}$ $= 2545 \text{ Btu/h}$
Time	$1 \text{ h} = 60 \text{ min} = 3600 \text{ s}$ $1 \text{ day} = 24 \text{ h} = 1440 \text{ min} = 8.64 \times 10^4 \text{ s}$ $1 \text{ y} = 365 \text{ days} = 8.76 \times 10^3 \text{ h}$ $= 5.26 \times 10^5 \text{ min} = 3.16 \times 10^7 \text{ s}$	Mass-Energy Equivalents	$1 \text{ u} = 1.66 \times 10^{-27} \text{ kg} \leftrightarrow 931.5 \text{ MeV}$ $1 \text{ electron mass} = 9.11 \times 10^{-31} \text{ kg}$ $= 5.49 \times 10^{-4} \text{ u} \leftrightarrow 0.511 \text{ MeV}$ $1 \text{ proton mass} = 1.673 \times 10^{-27} \text{ kg}$ $= 1.007267 \text{ u} \leftrightarrow 938.28 \text{ MeV}$ $1 \text{ neutron mass} = 1.675 \times 10^{-27} \text{ kg}$ $= 1.008665 \text{ u} \leftrightarrow 939.57 \text{ MeV}$
Speed	$1 \text{ m/s} = 3.60 \text{ km/h} = 3.28 \text{ ft/s}$ $= 2.24 \text{ mi/h}$ $1 \text{ km/h} = 0.278 \text{ m/s} = 0.621 \text{ mi/h}$ $= 0.911 \text{ ft/s}$ $1 \text{ ft/s} = 0.682 \text{ mi/h} = 0.305 \text{ m/s}$ $= 1.10 \text{ km/h}$ $1 \text{ mi/h} = 1.467 \text{ ft/s} = 1.609 \text{ km/h}$ $= 0.447 \text{ m/s}$ $60 \text{ mi/h} = 88 \text{ ft/s}$	Temperature	$T_F = \frac{9}{5}T_C + 32$ $T_C = \frac{5}{9}(T_F - 32)$ $T_K = T_C + 273.15$
		Angle	$1 \text{ rad} = 57.3^\circ$ $1^\circ = 0.0175 \text{ rad}$ $15^\circ = \pi/12 \text{ rad}$ $30^\circ = \pi/6 \text{ rad}$ $45^\circ = \pi/4 \text{ rad}$ $60^\circ = \pi/3 \text{ rad}$ $90^\circ = \pi/2 \text{ rad}$ $180^\circ = \pi \text{ rad}$ $360^\circ = 2\pi \text{ rad}$ $1 \text{ rev/min} = (\pi/30) \text{ rad/s} = 0.1047 \text{ rad/s}$

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