

Harold's Physics Units of Measure

Cheat Sheet

26 August 2022

The 7 Base Units of Measure

Quantity Name	Symbol	Metric Units (SI)	Imperial Units (English)
1. Length / Distance	l, x, y, z	meter (m)	foot (ft)
2. Mass	m, M	kilogram (kg)	slug (or lb)
3. Time	t	second (s)	
4. Temperature	T	Kelvin (K) Celsius (°C)	Fahrenheit (°F)
5. Electrical Current	i	Ampere (A) or C/s	
6. Amount of Substance	M, χ	mole (mol)	1 mol = $6.02214076 \times 10^{23}$
7. Luminous Intensity	lv	Candela (cd)	
Note: The 7 base units are mutually independent from each other. All other units of measurement can be derived from them.			

Derived Units of Measure

Quantity Name	Symbol	SI Units	English (Imperial) Units
Length / Displacement	s, d, h	meter (m)	foot (ft)
Area	A, S		ft ²
Volume	V	liter (l)	fluid ounce (fl) ft ³
Velocity / Speed	v, s		m/s ft/s
Acceleration	a, g	g = 9.81 m/s ²	g = 32.2 ft/s ² ft/s ²
Jerk / Jolt	J		m/s ³ ft/s ³
Impulse	I		N • s kg • m/s lb • ft/s
Linear Momentum	p		kg • m/s lb • ft/s
Force	F	Newton (N)	kg • m/s ² pound (lb) slug • ft/s ²
Energy / Work / Heat	E, W, KE, U, Q	Joule (J)	N • m kg • m ² /s ² calorie (cal) ft • lb
Power	P	Watt (W)	J/s kg • m/s ³ horsepower (hp) ft • lb/s
Surface Tension	T		N/m kg/s ² lb/ft

Pressure	P	Pascal (pa) bar	N/m^2 $\text{kg} \cdot \text{m/s}^2$	atmosphere (atm.)	
Density	ρ		kg/m^3		slug/m ³
Wavelength	λ		m		
Frequency	F, ν	Hertz (Hz)	1/s	cycles/s	
Time Period	T		s		
Angular Displacement / Plane Angle	θ	radian (rad)		Supplementary unit	
Solid Angle	Ω , sr	Steradian (Sr)		Supplementary unit	
Angular Velocity / Frequency	ω		rad/s		
Angular Acceleration	α		rad/s^2		
Moment of Inertia	I		$\text{kg} \cdot \text{m}^2$		
Angular Momentum	J, L		$\text{kg} \cdot \text{m}^2/\text{s}$ $I \cdot \omega$		
Torque (Moment of Force)	τ		$\text{N} \cdot \text{m}$		
Angular Impulse	J		$\text{N} \cdot \text{m} \cdot \text{s}$		
Electric Charge	Q, q, e	Coulomb (C)	$\text{A} \cdot \text{s}$		
Current Density	J		A/m^2		
Electric Potential / Electromotive Force (EMF)	V, \mathcal{E}	Volt (V)	W/A		
Electric Field	E		V/m		
Electric Flux	Φ_e		$\text{V} \cdot \text{m}$		
Electric Resistance	R	Ohm (Ω)	V/A		
Electric Capacitance	C	Farad (F)	C/V		
Electric Field Strength	E		V/m N/C		
Magnetic Flux	Φ_B	Weber (Wb)	$\text{V} \cdot \text{s}$		
Magnetic Field / Flux Density	B	Tesla (T)	Wb/m^2		
Magnetic Induction	I_m	Henry (H)	$\text{N/A} \cdot \text{m}$ Wb/A		
Illumination	I_x	Lux (Lx)	lum/m^2		
Luminous Flux	Φ	Lumen (Lm)	J/s		

Unit Prefixes

Prefix	Symbol	Factor	Power	English
googolplex-		(too long)	10^{1000}	googolplex
googol-		(too long)	10^{100}	googol
yotta-	Y	1 000 000 000 000 000 000 000 000	10^{24}	septillion
zetta-	Z	1 000 000 000 000 000 000 000	10^{21}	sextillion
exa-	E	1 000 000 000 000 000 000	10^{18}	quintillion
peta-	P	1 000 000 000 000 000	10^{15}	quadrillion
tera-	T	1 000 000 000 000	10^{12}	trillion
giga-	G	1 000 000 000	10^9	billion
mega-	M	1 000 000	10^6	million
kilo-	k	1 000	10^3	thousand
hector-	h	100	10^2	hundred
deca-	da	10	10^1	ten
(none)	(none)	1	10^0	one
deci-	d	0.1	10^{-1}	tenth
centi-	c	0.01	10^{-2}	hundredth
milli-	m	0.001	10^{-3}	thousandth
micro-	μ	0.000 001	10^{-6}	millionth
nano-	n	0.000 000 001	10^{-9}	billionth
pico-	p	0.000 000 000 001	10^{-12}	trillionth
femto-	f	0.000 000 000 000 001	10^{-15}	quadrillionth
atto-	a	0.000 000 000 000 000 001	10^{-18}	quintillionth
zepto-	z	0.000 000 000 000 000 000 001	10^{-21}	sextillionth
yocto-	y	0.000 000 000 000 000 000 000 001	10^{-24}	septillionth
Googolth-		(too long)	10^{-100}	googolth
Googolplexth-		(too long)	10^{-1000}	googolplexth