

Harold's Physics Units of Measure

Cheat Sheet

26 January 2026

The 7 Base Units of Measure

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

Derived Units of Measure – Mechanics: Linear

Quantity Name	Symbol (Value)	Metric Units (SI)	Imperial Units (English)
Length / Displacement	d, l, h, r, s	meter (m)	foot (ft)
Area	A, SA		ft ²
Volume	V	liter (l)	fluid ounce (fl) ft ³
Velocity / Speed	v, s		ft/s
Acceleration	a, g	$g = -9.81 \text{ m/s}^2$	$g = -32.2 \text{ ft/s}^2$
Jerk / Jolt	J		ft/s ³
Impulse	I		lb·ft/s
Linear Momentum	p		lb·ft/s
Force	F	Newton (N)	pound (lb) slug·ft/s ²
Energy / Work / Heat	E, W, KE or K, U _g , U _s , U _E , Q	Joule (J)	calorie (cal) ft·lb
Power	P	Watt (W)	horsepower (hp) ft·lb/s

Surface Tension	T		N/m kg/s ²		lb/ft
Pressure / Stress	P	Pascal (Pa) bar	N/m ² kg/m·s ²	atmosphere (atm)	lb·ft/s ²
Density	ρ		kg/m ³		slug/m ³

Derived Units of Measure – Mechanics: Angular

Quantity Name	Symbol (Value)	Unit Name	SI Units	SI Base Units
Wavelength	λ	Meter	m	m
Frequency	f, ν	Hertz (Hz)	cycles/s	1/s
Period	T	second	s	s
Angular Displacement / Plane Angle	θ	radian (rad)	m/m	1
Solid Angle	Ω, sr	Steradian (sr)	m ² /m ²	1
Angular Velocity / Frequency	ω		rad/s	1/s
Angular Acceleration	α		rad/s ²	1/s ²
Moment of Inertia	I		kg·m ²	kg·m ²
Angular Momentum	J, L		kg·m ² ·rad/s	kg·m ² /s
Torque (Moment of Force)	τ		N·m	kg·m ² /s ²
Angular Impulse	J		N·m·s	kg·m ² /s

Derived Units of Measure – Electromagnetics

Quantity Name	Symbol (Value)	Unit Name	SI Units	SI Base Units
Electric Charge	Q, q, e	Coulomb (C)	s·A F·V	C
Current Density	J		A/m ²	A/ m ²
Electric Potential / Electromotive Force (EMF) / Voltage	V, ε	Volt (V)	W/A J/C	kg·m ² /s ³ ·A
Electric Field	E		V/m	kg·m/s ³ ·A
Electric Flux	l _e		V·m	kg·m ³ /s ³ ·A
Electric Resistance	R	Ohm (Ω)	V/A 1/S	kg·m ² /s ³ ·A ²
Electric Capacitance	C	Farad (F)	C/V s/Ω	s ⁴ ·A ² /kg·m ²
Electric Field Strength	E		V/m	N/C
Electric Conductance	G	Siemens (S)	1/Ω A/V	s ³ ·A ² /kg·m ²

Magnetic Flux	Φ_B	Weber (Wb)	V·s J/A T·m ²	kg·m ² /s ² ·A
Magnetic Field / Flux Density	B	Tesla (T)	Wb/m ² V·s/m ² N/A·m	kg/s ² ·A
Magnetic Induction	I_m	Henry (H)	Wb/A V·s/A Ω ·s	kg·m ² /s ² ·A ²

Derived Units of Measure – Photometry

Quantity Name	Symbol (Value)	Unit Name	SI Units	SI Base Units
Illuminance / Illumination	lx	Lux (lx)	lm/m ²	cd/m ²
Luminous Flux	Φ	Lumen (lm)	J/s cd·sr	Candela (cd)

SI Unit Prefixes

Prefix	Symbol	Decimal	Base 10	English
Googolplex-		(too long)	10^{1000}	googolplex
Googol-		(too long)	10^{100}	googol
Quetta-	Q	1 000 000 000 000 000 000 000 000 000	10^{30}	nonillion
Ronna-	R	1 000 000 000 000 000 000 000 000 000	10^{27}	octillion
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
hecto-	h	100	10^2	hundred
deca-	da	10	10^1	ten
		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
ronto-	r	0.000 000 000 000 000 000 000 000 001	10^{-27}	octillionth
quecto-	q	0.000 000 000 000 000 000 000 000 000 001	10^{-30}	nonillionth
googolth-		(too long)	10^{-100}	googolth
googolplexth-		(too long)	10^{-1000}	googolplexth

Sources:

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